

The Influence of Legal and Regulatory Context on Perceptions of
Hydraulic Fracturing Risks

by

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Dissertation submitted in partial fulfillment of
the requirements for the degree
of Doctor of Philosophy in Environment
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ABSTRACT

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Abstract

Hydraulic fracturing (“fracking”) has been hailed by some as a perfectly safe process for reaching previously unreachable pockets of natural gas. Others, however, claim that it poses a significant threat to human health and the environment, and have strongly advocated for its to be banned. Amid this fierce debate over fracking’s safety, residents living in communities affected by it have had to make potentially life-altering decisions, such as whether to lease their land for the siting of a fracking well, or whether to file a lawsuit after discovering contamination of their well water. While prior research has investigated a number of factors that predict support or opposition to fracking, these studies have not explored the concrete ramifications of residents’ risk perceptions.

In this study, I examined both fracking-related lawsuits, as well as data on spills and water contamination incidents alleged to have occurred in Pennsylvania since the start of the fracking boom. I then conducted in-depth interviews with residents living in fracking-heavy communities in Pennsylvania in order to understand how their experiences with fracking shaped their perceptions of its risks, and of the legal and regulatory frameworks governing it. Applying the grounded theory method of analysis (Chapter 2), I found that the importance of feeling informed about various aspects of fracking featured prominently in the interview data. Participants expressed regret when they spoke of making decisions without sufficient information, and they expressed

frustration at striving in vain to get complete or comprehensible safety information, and they expressed that not having sufficient risk information made them more fearful of the threats posed by fracking.

Although the ways in which people form perceptions of risk have been studied for decades, I found that their manifestation in the real-world context of fracking supports the conclusions of previous studies, but also points towards some nuances that merit further exploration (Chapter 3). Policymakers, in particular, should be cognizant of how individuals draw conclusions about fracking safety, and this study demonstrates that the cognitive mechanisms governing risk perception can have tremendous consequences for residents' lives. Risk perception goes beyond mere support or opposition, but can instead inform life-altering decisions. I found that the mental shortcuts residents employed when interpreting risk information in the face of uncertainty could be exploited by landmen seeking to procure leases from landowners.

Relatedly, I found that concerns about fracking risks were exacerbated by participants' feeling that they had insufficient access to comprehensive and comprehensible information about fracking's potential risks to their health and the environment (Chapter 4). Among those who expressed concerns about fracking safety, the lack of reliable risk information was a chief concern. The most commonly sought information related to fracking fluid composition, spill and violation data, comprehensible water and air monitoring results, and water well contamination data.

Drawing from scholarship on the use of information disclosure as a regulatory tool, I discuss the need for increased information transparency in this context, and propose several policy interventions to ease the information asymmetry experienced by residents in these communities.

One of the ways in which safety-related information is concealed is through the use of nondisclosure agreements (“NDAs”) in settlements involving fracking-related claims. Residents who make such claims, whether formally or informally, find that in order to get any kind of financial restitution, they must sign an NDA as part of the settlement. I found that for other residents living in these communities, the systematic use of NDAs to settle claims obscured their ability to assess the frequency of water well contamination incidents, as affected landowners are forbidden by these NDAs to speak of their experiences. Using the interview data gathered in Pennsylvania, I compared the use of NDAs in the fracking context with their similarly systematic use in settling workplace sexual harassment claims (Chapter 5). I then analyzed the law governing these contracts of silence, and proposed ways to maintain the public policy benefits of NDAs, while minimizing the potential harm to third parties that comes from concealing harmful behavior.

But residents’ frustration with NDAs comprises only a small fraction of the dissatisfaction expressed about the legal system’s handling of fracking-related claims. Participants identified a number of ways in which the legal system disadvantaged

plaintiffs who brought water contamination claims against gas companies (Chapter 6). Although not all participants perceived the legal system to be intrinsically favorable to defendant gas companies, those with a pessimistic view of the legal system are united by their belief that fracking is dangerous. The interview data strongly suggests that those who consider fracking to pose a threat to them personally, correspondingly perceive that the legal system would fail to adequately compensate them in the event of a fracking-related injury. The disconnect between what they expect the legal outcomes should be, and what they perceive the outcomes actually are, appears to fuel disillusionment with the legal system that diminishes its fairness and legitimacy in their eyes.

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1. Introduction

The United States' energy landscape was revolutionized in the late 1990s when hydraulic fracturing ("fracking") was combined with horizontal drilling techniques that extend a well's reach sometimes miles beyond the space immediately below it. This technical advance allowed access to shale gas deposits that had previously been considered economically unviable to reach. Among those newly accessible shale deposits is the Marcellus formation, which covers a significant portion of Pennsylvania (figure 1). The natural gas production from this formation has risen dramatically since 2009, and currently exists as the highest shale gas producing region in the United States (U.S. Energy Information Administration, 2018). A substantial portion of that production comes from wells drilled in Pennsylvania, which went from only a handful of fracking wells in 2005, to approximately 5,000 in 2011 (FracTracker Alliance, 2020), and over 12,000 such wells by the end of 2019 (FracTracker Alliance, 2019).

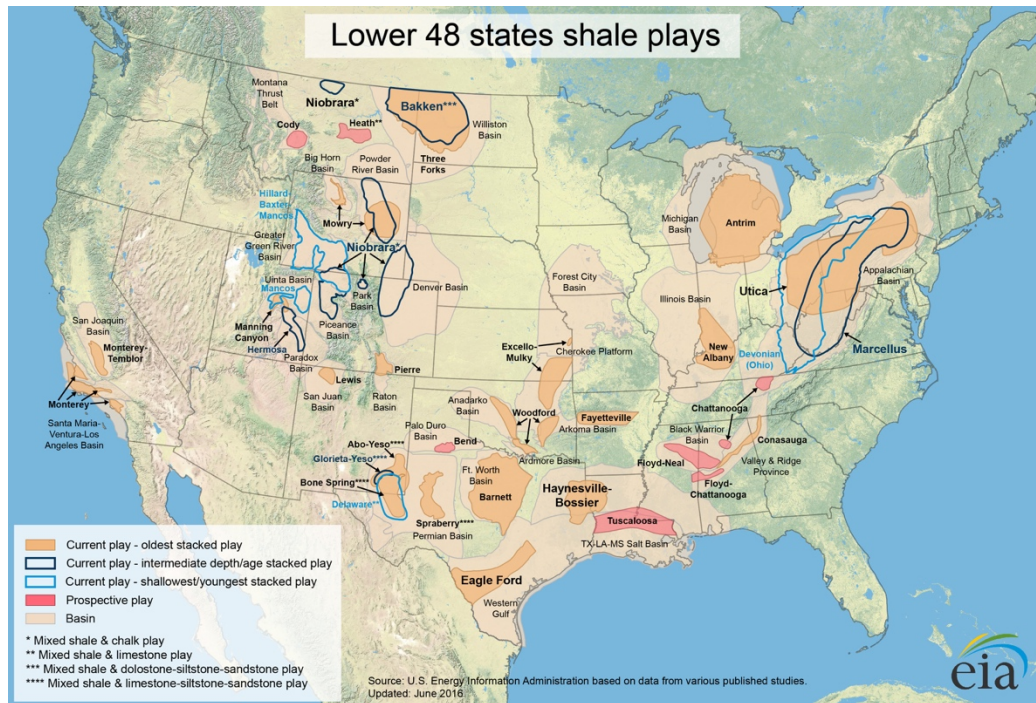


Figure 1: U.S. shale plays (source: U.S. Energy Information Administration)

Much of the shale gas in the Marcellus formation sits under privately-owned land, meaning that gas companies not only had to secure leases in order to site wells or other fracking-related equipment on that land, but they also had to pay royalties for the gas that they extracted. Although the rent for initial leases was not more than a few dollars per acre, as word began to spread that landmen and gas companies were racing to secure leases from landowners, per acre payments rose into the thousands. Given the potential productivity of the Marcellus formation, landowners were promised a financial windfall was coming, something that was sorely needed in these predominantly rural areas with proportionately high poverty rates. Even those who were not in a position to lease their land or receive royalties were told that they could expect a boost to the local

economy, as all manner of local businesses would see increased revenue accompany the arrival of the gas industry.

But in addition to these economic benefits, concerns were voiced about the potential risks to human health and the environment that might also accompany the arrival of fracking.¹ The litany of negative consequences cited by critics includes: air pollution, contamination of surface and groundwater, depletion of water resources, noise, dust, and increased truck traffic. Because Pennsylvania has over one million private water wells (Penn State Extension, 2016), the threat of groundwater contamination became a focal point for those opposed to the proliferation of fracking. But as the boom continued, health experts expressed concern that air pollution was actually the greater threat to human populations living near fracking operations. Although opponents of fracking cite the burgeoning body of research into its impacts on human health and the environment, the gas industry and fracking proponents dismiss any such claims, and maintain that fracking is a safe process that will actually yield a net benefit to the environment.

The newness of the technology, its swift arrival and proliferation, its proximity to human populations, and the fierce controversy surrounding its safety, all combined to create a uniquely difficult situation for those striving to understanding what risks they

¹ To align with the popular understand of the term, “fracking” is meant to encompass the entire unconventional shale gas production process, from drilling to completion, and is not limited to the stimulation of the well using highly pressurized liquids.

might face from fracking. In a context where the potential for financial windfalls and severe health outcomes loom large, risk perception is not an abstract concept. Instead, it played a key role in how people approached potentially life-altering decisions, such as whether to lease family land for a well, taking the chance that a generational property might be contaminated and thus rendered uninhabitable. Now that the boom has subsided, residents living in affected communities have had time to reflect on their experiences with fracking.

Broadly speaking, I sought to investigate how individuals perceive the risks of an industrial activity taking place in and around their communities, as well as how they felt about regulations designed to protect them from those risks, and the legal system in place to compensate them in the event of injury. The goal was to determine whether any relationship could be discerned between perceptions of risk, and perceptions of the legal system and the regulations governing fracking, a question that had not been examined previously.

2. Methodological approach

The controversy surrounding fracking's impact on human health and the environment has prompted research into how the general public perceives fracking and its risks (*e.g.*, Boudet et al., 2014). But those studies have not examined individuals' perceptions of legal remedies and lawsuits in the context of fracking, something that has implications for fracking governance, toxic tort litigation, and the risk perception literature. To address this gap, I undertook an exploratory study that used in-depth interviewing techniques to develop a deep understanding of individuals' perceptions of the legal and regulatory context surrounding fracking. Instead of fitting the data into *a priori* categories, themes and patterns were allowed to emerge from the data that were then tied to the literature and developed into theories. The goal of the research was not to run an experiment that attempts to isolate a variable, but rather to gather voluminous data from participants that could provide contextual information regarding not only how they felt the issues of interest, but what experiences or other factors informed those feelings. "Within an exploratory analysis, the ambition is not to cover the whole range of phenomena, but to present selected patterns relevant for the study aim." (Malterud et al., 2016, p. 1756)

Because perceptions of regulations and legal remedies related to fracking had not been investigated previously, the purpose of the research was exploratory. Therefore, I sought to gain an understanding of individuals' experiences that could lead to the

development of theories about how they interpret these legal and regulatory issues (Strauss and Corbin, 1998). The dynamic nature of qualitative methods allows for in-depth probing of ideas, as well as the flexibility to follow new insights gained during the research. For this reason, they provide the rich data necessary for the initial exploration of a topic, particularly when the topic relates to the experiences of individuals within the context of interest. I selected semi-structured interviews to conduct this study, as they allowed for follow-up questions that get beyond how a participant feels about a particular topic in order to get to *why* she feels that way. Likewise, semi-structured interviews allowed me to take insights made during the course of the investigations, and weave them into future interviews.

Analysis of the interview data proceeded in accordance with the grounded theory method (figure 2). The grounded theory method was ideally suited for carrying out this investigation, as it was conceived as a means of developing new theories directly from data (Timonen et al., 2018). Rather than establishing *a priori* categories into which the data must fit, grounded theory employs a constant comparative method that compels the researcher to compare collected data to both the literature and to subsequently collected data throughout the data collection process. That is, thematic categories and codes are only developed after initial data collection and analysis have been performed, and those categories are subject to modification as new data collection and analysis proceeds. By constantly comparing initial data to newly collected data, and

by comparing that data to emerging categories, themes and connections are refined and strengthened. Employing the grounded theory method also requires engaging with the literature to determine where emerging themes and categories might be located within that literature. In keeping with grounded theory methods, new themes informed subsequent interview questions as they emerged from previous interviews.

In-depth interviewing of a small number of participants provides the rich data necessary for the initial exploration of a topic (Webley, 2010). The opportunity for follow-up questions and elaboration provides a deep understanding of how a participant living within the context of the phenomenon of interest interprets events. The goal was to develop theories related to those interpretations that could be further explored and tested in this and similar contexts. Therefore, no attempt is made to generalize to populations outside the context of fracking in Pennsylvania.

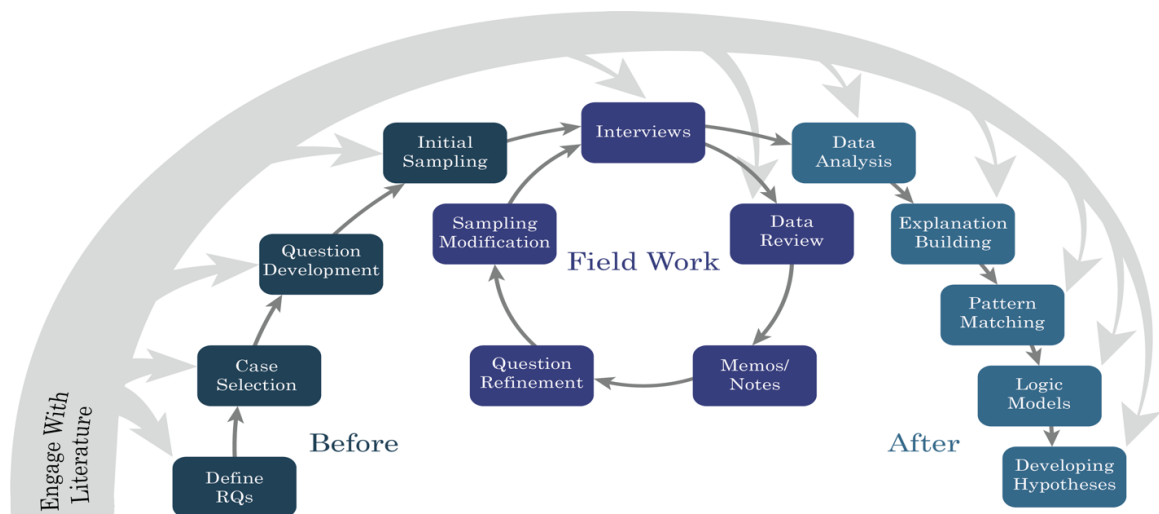


Figure 2: Grounded theory method, as applied to this study

As a means of identifying initial interview participants, and triangulating interview data, I examined additional data, consisting of summaries and text of fracking-related tort lawsuits, DEP oil and gas compliance databases, oil and gas well maps, and national and local media stories related to fracking-related incidents in Pennsylvania, some of which provided context and verification of participants' descriptions of particular events. I gathered additional contextual information by speaking with professors, doctors, and activists, as well as researchers from an environmental health NGO that offers air monitoring to residents living near fracking operations. I also gained access to active and inactive well sites, pipelines, and other fracking-related infrastructure.

2.1 Sampling procedures

Because the goal of the research was to examine a particular phenomenon within its own context, study participants were selected purposively to ensure rich data relevant to the questions of interest (Cleary et al., 2014). "In grounded theory, representativeness of concepts, not persons, is crucial." (Corbin and Strauss, 1990, p. 9) Thus, to develop a sample of individuals whose perspectives could deepen this understanding required including participants who lived in communities subject to the risks posed by fracking activities. Furthermore, including individuals with at least a potential awareness of the existence of lawsuits and regulations related to fracking was necessary. For these reasons, the sample universe was defined as individuals living in

Pennsylvania communities that have had fracking activities within or adjacent to those communities, and where fracking-related regulatory violations had occurred.

Interviewee selection was not further predicated on political boundaries, such as townships or counties.

Although several states have fracking within their borders, a number of factors made Pennsylvania uniquely suited to the exploration of the study's principle questions (Robinson, 2014). First, Pennsylvania has thousands of fracked wells, and many of its communities have experienced significant groundwater contamination incidents related to fracking, several of which have been covered extensively by local and national media. Additionally, Pennsylvania has developed regulations specific to fracking, some of which were the subject of a well-publicized lawsuit. Although Pennsylvania has had energy development within its borders since the 1800s, fracking has intensified and diversified this development. This intensification and diversification offered the opportunity to explore how individuals in communities affected by fracking perceive the risks that have accompanied this rapid development, particularly now that sufficient time has passed for outcomes to be evaluated. Within Pennsylvania, fracking has been most intense in the northeastern and southwestern portions of the state, so interviews were divided among residents living in those two areas (figure 3).

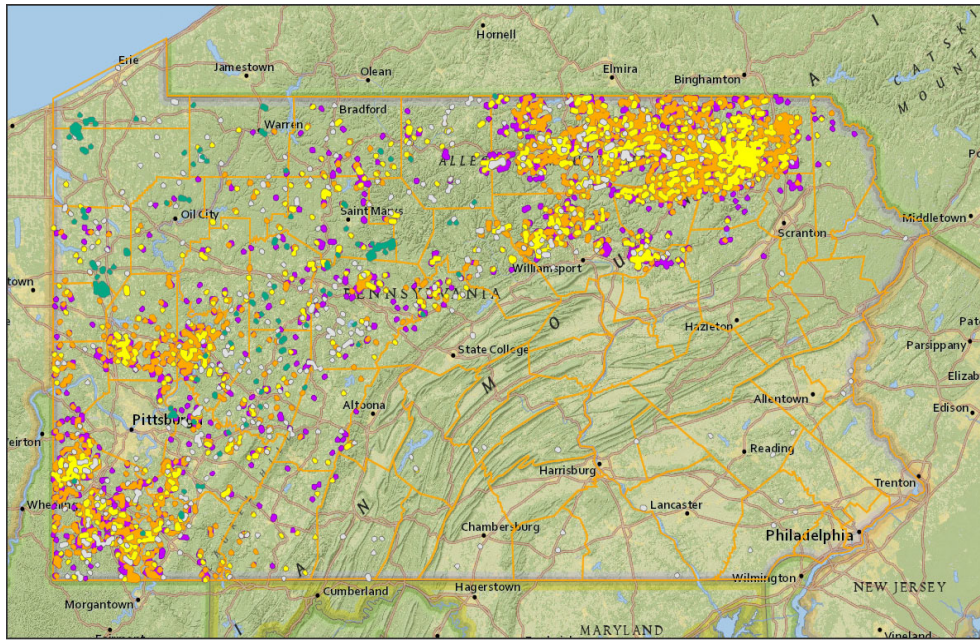


Figure 3: Map of fracking activity and violations (source: FracTracker Alliance)

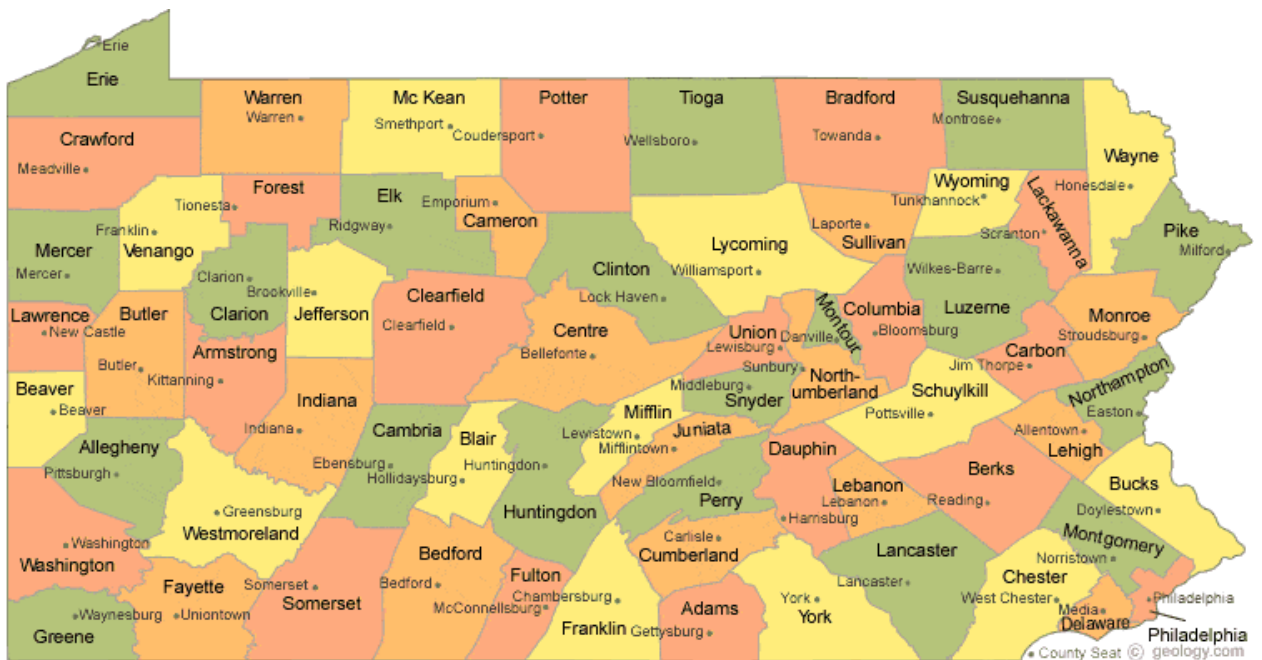


Figure 4: Pennsylvania County Map with County Seat Cities (source: geology.com)

After defining the outer bounds of the sample within Pennsylvania, individual participant sampling proceeded theoretically, which means that participants were not selected randomly, but were instead selected pursuant to the theoretical framework at issue (Coyne, 1997). Because the study sought to develop theories about how individuals at risk of harm from fracking activities perceive those risks, those activities' regulation, and the means of compensating their alleged harms, the study included only those individuals who lived or had lived where they might be exposed to such potential risks, as they would be able to shed light on those questions (Corbin and Strauss, 1990). Thus, I sought participants who had sufficient familiarity with fracking operations to have opinions about its safety and the legal and regulatory frameworks governing it. Individuals living in heavily fracked parts of Pennsylvania were considered highly likely to have such opinions.

Initial identification of interview participants began with my contacting environmental health non-governmental organizations ("NGOs"), such as the Southwest Pennsylvania Environmental Health Project, and three faculty members at the University of Pittsburgh who had conducted research in fracking-heavy areas in Pennsylvania. Both the NGO and faculty contacts put me in touch with additional contacts. Only one of those contacts ultimately participated in the study, but others provided additional contact information. That additional contact information led to the first interviews in northeast Pennsylvania. Throughout the data collection process, I

asked for additional contacts at the conclusion of each interview. This kind of snowball sampling is particularly appropriate in situations, such as this one, where participants may be reluctant to respond to advertising due to the controversial nature of the topic (Robinson, 2014).

On one occasion, my attendance at an anti-fracking group's strategy meeting yielded contact information that led to attendance at a meeting organized by homeowners who were attempting to fight the installation of a gas pipeline through their neighborhood. Four of those homeowners agreed to interviews, and I was provided with documents related to the proposed pipeline project. This group constitutes an example of theoretical sampling, as they were in a position to provide insight into the issues that are at the heart of the study, namely how those who are sincerely concerned about likely harm to themselves or their properties perceive legal and regulatory issues related to fracking. Likewise, because they had only discovered the pipeline project two months before my arrival, they were able to speak to the state of their risk perceptions prior to learning about the project.

While interviews proceeded using snowball sampling techniques, I simultaneously engaged in convenience sampling, whereby qualified participants were identified by happenstance (Robinson, 2014). I followed all leads, meeting contacts and participants by introducing myself in bars, restaurants, and coffeeshops, and by distributing my contact information to organizations such as the Chamber of Commerce.

Those who agreed to participate were then asked for additional potential contacts, in line with snowball sampling techniques. The fluidity of this process is best illustrated by an interview participant who suggested I attend a farmers' market to seek participants. While I was at the market meeting potential participants, that interview participant arrived and introduced me to still more contacts and participants.

The first contact in southwest Pennsylvania reached out to me directly, after receiving my contact information from a faculty member at Duquesne University with whom I had previously spoken. This contact provided names and contact information for others who would ultimately participate in the second phase of interviewing. I relied more heavily on snowball sampling in southwest Pennsylvania, as emerging themes led me to seek participants who had direct experience with environmental, health, and legal issues. I did so by reaching out to an activist group that provided support and information for those who believe they have been harmed by fracking. The emerging themes were then explored in-depth during these subsequent interviews, in line with the grounded theory method (Strauss and Corbin, 1998). I was aware that pursuing participants with these experiences would yield an overall sample that disproportionately consisted of individuals who had a strong dislike of fracking. However, the goal of the study was not to get a random, representative sample, but rather to gain insight into risk perception and perceptions of the legal system. Focusing on those who have negative opinions of fracking provided a window into their thinking

on these issues, which can be reasonably generalized to other individuals who oppose fracking. Furthermore, this focus provided rich data that informed the theories and policy recommendations in the chapters that follow.

Interviews continued until new themes ceased to emerge, and concepts elicited from subsequent interviews became redundant, signaling saturation (Cleary et al., 2014). This yielded a sample size of 38 interviews (33 of which were recorded, for a total of 40 recorded interviewees) consisting of 47 individuals. 29 participants were men, 18 were women, all were Caucasian, and their ages ranged from early 30s to late 70s, approximately. Participants represented a variety of economic and professional backgrounds (including farmers, teachers, small business owners, and mechanics), though not all offered information on their professions or employment history. Although efforts were made to solicit interviews from individuals working in the gas industry, several expressed either a distrust of academics, or an inability to participate pursuant to their employers' preferences (see Drake, 2018).

Interview participants had very different experiences with fracking that informed their opinions. Some had leased their land to gas companies; some had bought land in the area unaware of nearby fracking operations; others had lived in the area their whole lives, only to have fracking operations commence nearby; others had had issues with their air or water, leading some of them to file lawsuits; others had seen

their businesses thrive after the arrival of fracking; and others had moved away from these areas to escape fracking activities entirely, embracing the label “fracking refugee.”

Participants lived in various counties in Pennsylvania (including Butler, Greene, Washington, Westmoreland, Bradford, Lycoming, and Luzerne (figure 4)). As noted above, in one instance, I conducted five interviews with people living in the same neighborhood who had banded together to fight a pipeline being run through an adjacent lot. Yet apart from that group, all other interviews were conducted with individuals living in different areas, often many hours away from each other. Some interviewees were farmers, whose land was not near any significant population center; others lived near very small towns; and still others lived in slightly more densely populated areas near Williamsport, Washington, or Butler. Even when snowball sampling led me from acquaintance to acquaintance, those individuals usually lived many miles apart. The geography of this area rarely lent itself to more than one interview in a single neighborhood, with the exception of the group described above.

Although some participants identified themselves as Republicans or Democrats before or during the interviews, others did not speak of their political affiliations. I consciously elected not to solicit political affiliation or any other demographic information from any participants out of concern for biasing the interviews, compromising the openness of responses, or limiting recommendations for additional participants. Given the divisiveness of the fracking issue for people living in these areas,

I was often met with suspicion as to my intentions when I sought interviews. To minimize concerns about having motivations other than my stated research goals, I avoided asking any personal questions that went beyond the topics directly related to the study. Although I could surmise genders and age ranges, any other personal information came without my soliciting it. However, that I identified myself as a graduate student researcher from Duke University may nevertheless have influenced decisions about participating in the study, as well as recommendations for additional participants. Potential participants may have been reticent to interview with a graduate student from an out of state, private university.

2.2 Interview procedures

Interviews were semi-structured, and lasted anywhere between 30-75 minutes. Each participant who consented to the interview being recorded was provided with a consent form, a signed copy of which I kept. This consent form was reviewed and approved by the Institutional Review Board prior to conducting any interviews in order to ensure protection of the human subjects participating in the study. Prior to commencing any interview, I described the purpose of the study to the participants as being an examination of how individuals felt about fracking, its risks, and legal and regulatory issues related to it. Interviews began with my asking participants to offer their thoughts on fracking, generally. The goal was to be as open-ended as possible in order to get detailed background information on what experiences, if any, participants

had had with fracking. Subsequent questions varied, depending on prior responses, but the interview guide included the following topics, which were asked directly or arose organically:

- What risks, if any, the participants felt fracking posed
- Where they got their information about fracking and its risks
- What participants understood about regulations governing fracking, and how they felt about them
- How participants felt about regulatory agencies associated with fracking
- What participants knew about lawsuits filed in response to alleged fracking-related harm

Inclusion of these topics was necessary to ensure the questions fit within the context of existing theories of risk perception (Eisenhardt, 1989), and that the research questions were addressed in each interview. However, because I employed grounded theory, and theory building needed to remain grounded in the data, questions were not rigidly structured in the manner of hypothesis testing (Timonen et al., 2018). The use of semi-structured interviews gave participants the freedom to fully express their feelings on a topic, and gave me the opportunity to ask follow-up questions, and probe more deeply into topics of interest (Qu and Dumay, 2011). This freedom allowed for additional themes of relevance to be explored in subsequent interviews, in line with the constant comparative method used in grounded theory (Strauss and Corbin, 1998). I

took notes during and after interviews, which were revisited and reflected upon at the end of each day. These reflections, in consultation with the literature, informed modifications or additions to subsequent interview questions. This process occurred throughout the course of the interviewing phase of the study. Interviews continued until all questions and themes were thoroughly explored, and the interviews ceased yielding new themes. The redundancy of subsequent interview responses signaled saturation, at which point no additional interviews were taken (Cleary et al., 2014).

At the conclusion of interviewing, the recordings were transcribed verbatim by a team of Duke University undergraduate students. I then reviewed those transcripts in conjunction with the audio recordings to ensure accuracy. Each participant was assigned a unique identification number for use on the transcripts, and which is used to identify any direct quotations used in the study. In cases where an interview consisted of more than one participant, letters were appended to the identification numbers to indicate different speakers.

2.3 Data transcription and coding

The interview transcripts were then imported into NVivo, a qualitative data management platform, for coding and analysis. NVivo allows for structuring of coding themes, and comparison across detailed and complex data. Initial topics and codes had been developed prior to interviewing, based on an extensive review of risk perception literature. Additional topics and codes were developed during the course of

interviewing as themes began to emerge (an example of which appears below), which, in turn, directed subsequent theoretical sampling efforts and aided the continued emergence of additional themes (Timonen et al., 2018). Once the transcripts were imported, I engaged in line-by-line coding of the entire data set (Charmaz and Belgrave, 2007). Coding proceeded in three stages, pursuant to the grounded theory method: open, axial, and selective (or theoretical) (Corbin and Strauss, 1990). Open coding consisted of breaking down the data analytically, and applying conceptual labels that were later grouped and categorized. The second phase, axial coding, involved relating categories to subcategories, and verifying those relationships against the data. Coding during this phase is considered analytic coding, which involves identifying concepts, rather than topics, within the data (Hay, 2016). The final phase, selective coding, consisted of unifying categories around core concepts, which represent the central themes that emerged from the analysis (Corbin and Strauss, 1990).

NVivo uses standalone nodes, as well as parent and child nodes to aid in developing a coding system. Standalone nodes might represent descriptive topics, or they may represent higher-level concepts and categories. Parent nodes often represent broader thematic categories under which the more specific child (and grandchild) nodes belong. For example, the node structure used for the top-level “Government” node is as follows:

- Government

- Federal
- Local
- State
 - DCNR (Department of Conservation and Natural Resources)
 - DEP (Department of Environmental Protection)
 - Health Dept.
 - Police

This node is descriptive, and was applied in any instance in which a participant was discussing anything that could be considered related to the government (with the exception of legal matters, which comprised their own, much more detailed node structure).

In coding the interview transcripts, 41 parent and standalone nodes were used, along with 102 child or grandchild nodes. The vast majority of these codes were developed during the open coding phase using NVivo. As new topics emerged, new codes were used to capture those concepts. The evolution of these codes can be explained using the topic “legal” as an example. Given my research aims, I identified a number of legal topics that I intended to explore during the interview process, and I included them in the rough interview guide that I had created prior to my arrival in Pennsylvania. These topics included, among others, “tort suits”, “awareness”, “causality”, “courts”, “lawyers”, and “chances of success”. During the course of

interviews, certain topics began to emerge consistently, and were added to the list of initial topics. Because the interviews had not yet been transcribed, these topics were not formally used as codes at this point, but instead were added to the rough interview guide. Examples of additions under the “legal” topic included, among others, “NDAs”, “settlements”, and “royalty manipulation”. Both “NDAs” and “settlements” came up consistently throughout the interviewing process, but “royalty manipulation” ceased being a topic of interest approximately halfway through the interviews in northeast Pennsylvania.

The process of coding in NVivo can be briefly illustrated by using the DEP sub-node as an example. “DEP” was identified as a topic code that could be applied whenever participants discussed DEP. Topic coding applies to the subject of what participants were discussing, rather than what it means in a larger, theoretical sense (Hay, 2016). For example: “again, like I said, you know the DEP had sampled our water back when we had issues.” (1211) Here, the participant was merely describing an interaction with DEP. However, during the axial coding phase, a topic like DEP was combined with several analytic codes that represent theoretical concepts that had emerged. For example:

I think there are two different answers to that because people who notice that they’ve got water issues complain to DEP, and DEP, according to [investigative journalists], bury those complaints so as to make the whole notion of water issues associated with drilling appear to be much smaller than it really is. (1701)

This sentence is coded topically for DEP, but also includes codes for “Trust” (a standalone node) and “Transparency-hidden” (a child node of “Information”), among other codes. Those codes were developed as specific categories to reflect sentiments like those expressed here, namely trust in DEP, and whether the agency is transparent with regard to its water contamination findings. Data coded as both “Government” and “Information” appeared in 8 interviews, while data coded to both “Industry” and “Information” appeared in 17 interviews. Comparing and analyzing the interview data coded to these categories, and their more specific thematic subcategories, informed a primary theme to emerge from the interview data: that some individuals living in these areas feel as though they are not getting sufficient information about the risks and harms of fracking.

2.4 Strengths and limitations of methods used

Qualitative methods, and particularly semi-structured interviews, were well suited to carry out this exploratory research, but the methods used here do have limitations. For instance, the relatively small number of interview participants limits the ability to generalize the findings to broader populations and contexts. Likewise, snowball sampling techniques run the risk of creating selection bias, which may result in a sample skewed towards a particular perspective. Finally, although the interviews did rely on a general structure, they were not standardized, and each proceeded a little differently.

Despite these limitations, the methods used have strengths that align well with the goals of the study. The use of semi-structured interviews allowed participants to express their responses in a manner that reveals how they conceptualize the issues. Interviews also allowed me to follow-up for additional information and explore new themes as they emerged. By sampling purposively, the study was able to remain focused on individuals who lived within the context of the fracking phenomenon, and who could describe the experiences that informed their perceptions. Because the nature of the study was exploratory, this additional context proved important in developing theories about these perceptions.

2.5 Application of methods

The methods outlined herein were used to conduct the studies outlined in the following chapters. Chapter 3 explores residents' risk perceptions and how they influence decision-making and faith in institutions. Chapter 4 analyzes how residents in communities affected by fracking perceive the effectiveness of fracking regulations, as well as the state agencies tasked with enforcing them. It then examines the information deficits facing these residents, and how they draw conclusions about fracking risks in the face of inconsistent and controversial safety information. Chapter 5 examines a specific kind of information deficit in the fracking context by comparing the systematic use of nondisclosure agreements to settle fracking claims with similar use of such agreements to settle sexual harassment claims. Finally, Chapter 6 explores the influence

of risk perception on how residents living near fracking operations interpret legal outcomes and, in turn, assess the fairness of the legal system in handling claims made by those injured by fracking activities.

3. The formation and ramifications of fracking-related risk perception

3.1 Introduction

Combining hydraulic fracturing (“fracking”) with horizontal drilling techniques triggered a boom of natural gas development that brought with it both the promise of economic windfalls and the potential for environmental havoc (Garmezy, 2012). Within a very short period of time, natural gas reserves that had previously been considered economically unviable could now be profitably developed. A significant portion of the largest shale play in the United States, the Marcellus Shale formation, lies under Pennsylvania (Clough and Bell, 2016), and gas companies moved quickly to tap into these vast reserves. To illustrate the suddenness of the natural gas boom, in 2005, there were only a few of these unconventional gas wells in Pennsylvania, but by 2011 almost 5,000 such wells had been drilled (FracTracker Alliance, 2020). The total currently sits at over 12,000 fracking wells in Pennsylvania (FracTracker, 2019).

Communities sitting atop these gas reserves were unprepared for the swift arrival of fracking,¹ and were consequently unable to anticipate all the benefits and harms that might accompany it. Access to many of the gas reserves required drilling in and around communities, and doing so meant locating wells on private land. Landmen

¹ For the purposes of this dissertation, “fracking” refers to the entirety of the unconventional shale gas extraction process, and is not limited to the high-pressure injection of fluids underground.

and gas company representatives began aggressively seeking leases from landowners, offering not only rent money, but the promise of significant royalty payments for years to come (Eisenberg, 2016). Many desirable drilling sites in Pennsylvania were in rural, agricultural areas that had relatively low population density, but relatively high rates of poverty (Clough and Bell, 2016). For many residents living in these areas, the money to be made from leasing their land provided much needed economic relief.

Given the newness of the technology, however, the potential risks to human health and the environment posed by high-volume fracking operations were not well established. In the early days of the fracking boom, the scientific literature on fracking's impact was functionally nonexistent. But as drilling intensified, concerns were raised about consequences to human health and the environment. Opponents of fracking cite a litany of potential harms, including air pollution, surface and groundwater contamination, erosion and sedimentation, noise, and road congestion (Nolon and Gavin, 2013). As these concerns gained notoriety, residents living near fracking operations struggled to reconcile competing narratives on the safety of fracking with the promises of financial windfalls to economically struggling communities.

Due to a unique confluence of factors, the introduction of fracking activities near homes and communities has resulted in an incredibly rich environment in which to explore issues related to risk perception. Ambiguity with regard to the potential harmfulness of fracking arises, in part, from an incomplete body of research on human

health impacts. That ambiguity is exacerbated by politicized, media-focused campaigns driven by the gas industry on one hand, and anti-fracking activists on the other. At the same time, local economies received a general boost from the arrival of the gas industry, and in some cases, significant amounts of money were offered to landowners for the extraction of gas from beneath their property. As a result, financial windfalls accrued to a small number of landowners, yet other economic benefits also diffused to many others in the community. However, siting numerous gas wells in and around communities created a situation in which the negative impacts of well activities were unevenly distributed within the population. Some residents were affected intensely, while others living only a short distance away experienced few, if any, negative impacts.

A substantial body of research has emerged analyzing public support for fracking activities, which necessarily includes discussions of perceived benefits and risks (e.g. Alcorn et al., 2017; Howell et al., 2017; Davis and Fisk, 2014; Brasier et al., 2013). Likewise, there exists a robust literature on how individuals come to perceive the risks from a particular activity (e.g. Kahan, 2007; Slovic, 1987; Johnson and Tversky, 1983). However, few of these studies have examined the experience of living through the sudden arrival of high-volume fracking activities, or how residents came to make sense of the threats it posed, particularly in light of the ambiguous and conflicting risk information they were receiving. The present study addresses this gap in the literature by investigating the development of risk perceptions within the fracking context. By

conducting in-depth interviews with individuals living in communities affected by fracking, we sought to gain insight into: (1) what factors played a role in how residents came to understand fracking safety issues; and (2) what ramifications their risk perceptions had on important aspects of their lives.

We drew from the risk perception literature to interpret the interview data, and examined how the cognitive mechanisms identified in the literature manifested in a dynamic, real world context. We then analyzed the ramifications those mechanisms had for individuals' lives, and their implications for fracking governance.

3.2 Risk perception

One framework for conceptualizing risk is the psychometric paradigm, which maps different kinds of risks along two axes that measure dread risk and unknown risk. (Slovic, 1987). Dread risks are those that are, among other things, potentially catastrophic, involuntary, and of high risk to future generations. Unknown risks are those that are new, unfamiliar to science, unknown to those exposed, and whose effects might not manifest immediately. How individuals subjectively judge risks pursuant to these two dimensions informs overall perception of the risk. That is, the more a particular risk target exhibits characteristics that comprise the dread and unknown dimensions, the more likely an individual is to perceive its threat to be high.

Along similar lines, studies have demonstrated that when confronted with a risk target, people tend to make quick, emotional valuations that map along what may be

simply described as a good-bad spectrum (Slovic et al., 2007). Known as the affect heuristic, this unconscious response informs how an individual perceives the risks and benefits of that risk target. These perceived risks and benefits have been shown to be inversely correlated, and operate in both directions. That is, if an individual perceives the risks from a particular target to be high, that individual will, in turn, perceive its benefits to be lower. On the other hand, an individual who perceives the risks to be low will correspondingly tend to perceive the benefits as being higher. The reverse is also true, as individuals who see considerable benefits will perceive less risk, and *vice versa*. One interpretation of this inverse correlation is that to reduce dissonance, people adjust their perceptions of the risks and benefits to align with their immediate feelings (Kahan, 2007). Thus, the unconscious, emotional valuation of either the risks or the benefits will influence how individuals perceive the other.

Another risk perception mechanism, the availability heuristic, streamlines the estimation of the likelihood of potential bad outcomes associated with a particular risk target. This mental shortcut operates rapidly and unconsciously to give a rough sense of frequency based upon how easily one can recall a particular event happening (Schwarz, 1991). That is, how much mental energy is necessary to bring something to mind serves as a key piece of information in judging its frequency. Although it can be quite effective in certain contexts, the availability heuristic often biases estimations in predictable ways (Tversky and Kahneman, 1974). First, recent events tend to be more available, and thus

are mistaken for being more common than empirical data would suggest. Second, vivid or emotional experiences will disproportionately bias frequency estimates, as most people more easily recall an event that had a visceral impact on them (Schwarz, 1991). This tendency suggests that affect may influence the availability heuristic (Johnson and Tversky, 1983), as individuals' risk perception is also influenced by affect-laden images, stories, and narratives (Slovic et al., 2007).

Although many studies have demonstrated the influence of the affect and availability heuristics on risk perception, some question whether these heuristics, on their own, play a significant role (Kahan, 2012). Rather, they suggest that these mental processes operate within a larger cultural context, and differing worldviews provide a more complete explanation for disparities in risk perception between individuals. This cultural theory of risk posits that instead of evaluating the likelihood or gravity of harm posed by a particular risk target, individuals make unconscious judgments about whether permitting or restricting that activity aligns with the way of life to which they are committed. Likewise, individuals are much more likely to give credence to the risk and benefit evaluations made by people who share similar values or perspectives, and, in turn, will resist accepting those evaluations from people who hold different values (Kahan, 2007).

Trust in government and institutions is another factor that influences how members of the public view risks, particularly in the context of new technologies (Peters

et al., 1997). Heath et al., define trust as a determination that the institution in question is not only honest and competent, but also sincerely cares about the welfare of the people, without a hidden agenda (1998). Low levels of institutional trust reduce the effectiveness of a democratic government (Chang, 2013), and have far reaching implications for well-being (Hudson, 2006). For example, research suggests that a lack of trust fuels controversies over the management and regulation of risks from technological hazards (Slovic, 1993). It follows that individuals with low trust in the government are less likely to have their risk perceptions in line with expert risk assessment (Bord and O'Connor, 1992). However, acceptance of risk increases with confidence in companies' or government agencies' ability to manage those risks (Slovic, 1993). Confidence and trust in government entities, in turn, increases when those entities demonstrate a commitment to addressing the issue of concern. Likewise, trust in both the government and industry increases with demonstrations of transparency (Peters et al., 1997).

Proximity to a hazard can also influence risk perception. Heath, et al. (1998) found that communities closer to chemical facilities show higher support than those further away. They posit that these communities believe that the benefits outweigh the risks, while individuals living further away tend to overestimate the risks posed by these facilities. In the fracking context, Jacquet (2012) did not find a significant relationship between attitudes about natural gas development and proximity to a gas

well, but noted that the potential for landowners to benefit economically from nearby wells was a significant predictor of positive attitudes towards natural gas development. On the other hand, properties with private water wells sold for less money when located near fracking wells that had been cited for environmental violations (Cecot 2017).

3.3 Methods

Previous research on how fracking risks are perceived by affected residents has not examined in detail how those perceptions were formed, nor what ramifications they might have had. Therefore, the purpose of the present study was exploratory. The goal was to gain in-depth insight into individuals' experiences with fracking, as well as their perceptions of its risks, in order to develop theories about how those perceptions, in turn, affect important aspects of their lives. (Strauss and Corbin, 1998). The research was conducted using semi-structured interviews, and the subsequent analysis of gathered interview data adhered to the grounded theory method, which is well suited to developing new theories directly from data (Timonen et al., 2018).

3.3.1 Location selection

Although fracking is not unique to Pennsylvania, it provided the ideal context for exploring the study's principle questions (Robinson, 2014). For example, Pennsylvania has thousands of horizontal fracking wells, and many of those wells are sited on private land that has been leased to the gas companies. Furthermore, residents in Pennsylvania have alleged that their private water wells have been contaminated as a

result of fracking operations, and those incidents have gained national notoriety (Fox, 2010). Therefore, the number of potential interview participants who will have some experience with or opinions about fracking is high. Finally, because gas development activities in Pennsylvania have intensified significantly during the last 15 years, residents have experienced the consequences of this rapid development. Because fracking activities have been most intense in the northeastern and southwestern portions of Pennsylvania, interviews were divided among residents living in those two areas.

3.3.2 Data collection

Participants for the study were selected purposively so as to ensure relevance to the study questions (Cleary et al., 2014). Therefore, the study only included individuals who lived or had lived in communities subject to the risks posed by fracking activities. Selection of participants relied on both convenience sampling, in which qualified participants were identified by happenstance (Robinson, 2014), and snowball sampling, whereby participants recommended other participants. Snowball sampling is well suited to situations, such as this one, where participants may be hesitant to respond to anonymous postings or requests due to the controversial nature of the topic (Robinson, 2014). Interviewing continued until unique concepts and themes ceased to emerge from subsequent interviews, which suggests saturation (Cleary et al., 2014). The sampling process yielded 38 interviews (33 of which were recorded) consisting of 47 individuals

representing a variety of economic and professional backgrounds, including teachers, farmers, small business owners, and mechanics.

Interviews varied in length, but typically lasted between 30-75 minutes.

Participants who consented to having the interviews recorded were provided with a consent form, a copy of which was signed and returned to the researcher. This consent form had previously been reviewed and approved by the Institutional Review Board in order to ensure protection of those participating in the study. Most interviews commenced with a request by the researcher for participants' general thoughts on fracking. The prompt was intentionally broad in order to solicit detailed background information on what experiences, if any, participants had with fracking. Subsequent questions differed based on the initial responses, but all interviews included topics related to where interviewees got information about fracking, how they perceived its risks, how they perceived regulations and regulators, and how they interpreted lawsuits and legal outcomes.

3.3.3 Analytical approach

Recorded interviews were subsequently transcribed verbatim, and each participant was assigned a unique identification number for citation purposes. Letters were appended to the identification numbers to indicate different speakers for those interviews involving multiple participants. Interview transcripts were then imported into NVivo, a qualitative data management platform, for line-by-line coding and

analysis. Initial topics and codes were developed prior to interviewing, and were informed by an extensive review of risk perception literature. During the course of interviewing, additional codes were developed as new themes began to emerge. Those themes were then incorporated into subsequent theoretical sampling, which facilitated the emergence of additional themes (Timonen et al., 2018). After the transcripts had been imported in NVivo, the researcher coded the entire set, line-by-line (Charmaz and Belgrave, 2007). Doing so yielded additional codes, which were then grouped into concepts, categories, and themes.

3.4 Results

We found that many of the heuristics identified in the risk perception literature could be discerned from interviewees' characterization of fracking's safety, and how they came to the conclusions that they did. Our results are grouped around the different risk perception mechanisms identified in the literature as a means of highlighting the influence of the fracking context's unique characteristics.

3.4.1 The affect heuristic

As noted above, the affect heuristic describes a mental shortcut in which perceived risks are inversely correlated with perceived benefits. We found, in line with that model, that interviewees' perceptions of fracking risks were indeed influenced by the financial benefits offered by gas companies. At the early stages of the fracking boom, concerns about its impacts began to spread, and interviewees said that gas

company representatives would hold community meetings to both assuage residents' fears and to sign them up for leases. Interviewees alleged that landmen exploited the difficult economic circumstances of many residents to entice them to sign leases.

Interviewees, some of whom signed leases themselves, articulated that the promise of a financial windfall had a tendency to dwarf any other concerns, including those related to potential impacts on their health or the environment. One interviewee, who was told he would make millions of dollars in royalty payments, reported:

people come say 8-13 million dollars to me. "Hey, welcome, come on in, would you like to put that on my front porch? I'll take it right in the front yard, backyard, you could even put it through the house, I don't care, it sounds great." (1317)

This interviewee signed a lease, and stated that the prospect of making millions of dollars made it easy for him to trust assurances that only sand and water were going into the fracking well. After operations began, he and his son suffered health effects from chemicals in their water supply, while the royalties that the landman claimed would be in the millions, only ever amounted to a few thousand dollars. But his initial reaction to the offer is very similar to that of another interviewee who said he wished a gas company would ask him to lease his land:

if they called me tomorrow and said, "hey I wanna drill on you" -- pound a hole right now, go ahead. Clear it off. You know, I'm not afraid of it. ... come on boys, let's do it. The quality of life that you would get from that, you know. It would just be so much better." (1321)

But the affect model also predicts that perceiving significant risks from fracking will reduce the perception of its potential benefits, which is in line with what other interviewees expressed. When asked about what benefits fracking had brought to their communities, interviewees who were most concerned about fracking risks said that they saw few, if any, benefits. They claimed that gas companies brought in their workers from out of town, so employment in the area did not increase. Likewise, they felt that the benefits to local businesses were temporary at best, and nonexistent at worst.

3.4.2 The availability heuristic

In addition to, and perhaps in conjunction with, the affect heuristic, the availability heuristic appears to have influenced how interviewees perceived the risks of fracking. The dramatic and vivid flaming faucet scenes in Josh Fox's documentary *Gasland* (Fox, 2010), provide the best example of interviewees referencing such imagery to explain why they were concerned about fracking. Interviewees frequently referenced *Gasland* when asked about how they first came to worry about fracking, including two different couples who were living outside Pennsylvania at the start of the boom. The iconic flaming faucet footage is inextricably linked to *Gasland*, and is a perfect example of the kind of affect-laden imagery known to drive the availability heuristic.

I mean I heard about people that literally, when they turned on their spigots, they could light a match. I'm serious. And maybe they had some really bad luck up there, but I know that happened. Just as a little aside here, I mean, we all have a well up and down here. And if there was a leak or anything out here, we'd all be affected. (1611)

Gasland's popularity, combined with the viral nature of similar imagery, ensured that the flaming faucet would come to symbolize the risks of fracking for many people. But as other interviewees pointed out, flaming tap water is a poor representation of fracking risks, as it can occur without the presence of fracking operations. Interviewees related how, years before fracking arrived, they had grown up in the area knowing that certain lakes could be set on fire due to the methane in the water. Interviewees who supported fracking also cited the iconic flaming faucet videos, but as evidence that fracking is perfectly safe. Their referencing of these videos suggests that they also associate this imagery with fracking risks, but they consider those risks unfounded, at least in part, because some tap water had always been flammable. "Up there in Dimock where they had all that trouble, you could always light that on fire. You could always light it on fire. You could always do it ... it wasn't because of them." (1321)

3.4.3 The psychometric paradigm

In line with the psychometric paradigm, interviewees expressed that much of their concern with fracking arises from how little they feel they know about it. "I just feel that the gas industry has brought in a lot of unknowns, chemicals they're not forced to disclose that are being used or being leached and not being regulated." (1101) Interviewees asserted that efforts made by the gas industry to keep fracking fluid compositions secret only serve to exacerbate the unknown character of fracking risks. Interviewees expressed that not knowing what substances might be in the fluid makes

them more concerned about it, and the well-publicized efforts to keep it a secret suggest to them that it must be something toxic.

Interviewees also expressed their concerns about fracking in a manner that aligns with the dread risk dimension of the psychometric paradigm. One interviewee characterized the fracking process as putting poison down in the ground, something that may not affect his generation, but would certainly impact his grandchildren's generation. Another interviewee considered the risk posed by a nearby well to be potentially life-threatening: "I still feel it's risky. I know one thing goes wrong over there, I know we're gonna be flattened." (1233)

3.4.4 The influence of proximity and empathy

Interviewees explained that topographic features, such as hills, valleys, and rivers not only dictated where wells could be sited, but also played a role in how negative impacts were dispersed. For example, one interviewee claimed that residents living in one valley were consistently subjected to air pollution from a nearby well, while residents living on the other side of a small ridgeline were not, despite being roughly the same distance from the well. The polluted air, he claimed, settled in his valley, but did not clear the ridge to affect those on the other side. Therefore, he explained, that ridge very literally divided those in the area who supported fracking, and those who were concerned about the effects it was having on their health, and thus opposed it.

But from a more general perspective, how interviewees felt about fracking taking place near them or their property varied. For example, a few interviewees expressed support for having fracking operations in or around their communities. They cited the potential economic benefits fracking can bring, including new jobs and increased revenue for local businesses. Other interviewees, however, stated that while they supported fracking generally, they did not want those activities occurring close to their communities. Citing potential environmental harms, along with accompanying risks to human health, they said that they preferred that it take place far away to minimize impacts on them. One interviewee, for example, said he supported fracking as being beneficial to the country as a whole, but was opposed to having it take place in the valley in which he lived, citing the importance of that valley for outdoor recreation.

But interviewees also acknowledged that they did not tend to pay close attention to the issue until it threatened their own communities. “[I]f it happened in North Carolina we wouldn’t talk about it. If it happens in the other side of Williamsport ... it’s not as big an issue. If it happens here on my neighbor’s place, I’m pretty concerned. So it’s like everything else -- how close are you to it is what bothers you about it.” (0901) This perspective was echoed by other interviewees, who admitted that before moving into the area, they did not pay much attention to fracking or consider its ramifications. Even though they were aware of it, they said they were too focused on other aspects of their lives to form strong opinions.

Similarly, interviewees expressed the feeling that being geographically removed from fracking decreased both their interest in the issue as well as their empathy for those affected. One interviewee reluctantly admitted that before moving into an area with nearby fracking operations, he generally considered it to be “somebody else’s business.” (1932-A) This attitude validates other interviewees’ frustration that their negative experiences with fracking did not appear to affect others’ opinions of it.

So nobody really cares, nobody stops. You could talk about this stuff until you’re blue in the face. And very honestly with you, until it happens in your backyard, you really don’t care. I could talk about it until I’m blue in the face. I’ve had people that I’ve spoken to say, “Oh jeez, you did. That was terrible that happened to you. I hope you go after them or whatever. I really feel bad for you.” But they don’t have a clue. It’s like, gee, I appreciate your sympathy or whatever. (1420)

Interviewees implied that this lack of empathy for those living near fracking reduced concerns about its risks. For example, interviewees who were impacted early in the fracking boom found little support among others in the community, whom they said they could not convince of its potential harms. However, once more gas wells started appearing in the area, and geographical distance vanished for more people, they reported that more members of the community began to join in efforts to keep these operations at bay. Similarly, being able to connect with people who were suffering the impacts of fracking was crucial to how one interviewee came to understand the risks it poses.

[W]hen they came and spoke and told their personal stories, I can tell you that day changed my life. So I started going to these places actually

myself to take a look at it. It's one thing to read a newspaper article or something online about it -- I drove to Connoquenessing, I met twelve families, twelve households, saw what they were going through, and it was very real. It was very real. So it wasn't just -- I didn't just watch *Gasland*, you know. (1320)

3.4.5 Trust in institutions

Finally, interviewees who were most concerned about the potentially harmful consequences of fracking had correspondingly negative opinions about the performance of state agencies, particularly the Pennsylvania Department of Environmental Protection ("DEP"). Interviewees expressed dissatisfaction with numerous aspects of DEP's compliance and enforcement efforts. For example, interviewees alleged that the water tests DEP used to monitor landowners' water wells were not sufficiently comprehensive, and therefore failed to identify chemicals that are understood to be involved in the fracking process. Similarly, interviewees complained that when they called DEP to report severe air contamination episodes, DEP personnel arrived many days later and without proper air monitoring equipment. Interviewees also complained that spills of fracking fluids or other such incidents are not easily identifiable via DEP's website, fueling allegations of intentional suppression of this information. Interviewees also claimed, often explicitly, that DEP was more inclined to operate in the interests of the gas industry, rather than ensure its compliance with regulations. "The DEP is a totally captured agency ... from the policy directors above, which are usually the political that control the policy of the agency, are totally bought and paid for." (0_1101)

3.5 Distillation of key findings

Given how significantly fracking has affected residents' lives in some communities, their perceptions of its risks are not idle speculations. Life-altering decisions, such as whether to lease their land for development, have hinged on how they understood the risks fracking poses. The goal of this research was to gain insight into how individuals living in this dynamic and complicated environment came to the conclusions they did about fracking safety. Drawing on an extensive review of the risk perception literature, we analyzed how the oft-studied cognitive mechanisms operated within the complexities of the fracking context. In this section we discuss the ways in which our findings aligned with or diverted from expectation, as well as the material consequences of interviewees' risk perceptions.

3.5.1 The role of the affect heuristic in leasing decisions

We found that interviewees who stood to gain financially from leasing their land to gas companies judged the risks involved in a manner that is in line with what the affect model predicts (Slovic, 2007). In an environment in which landowners were offered upwards of \$2,000 per acre to sign a lease with the gas company, and told they could potentially reap millions of dollars in royalties, it is easy to understand how those landowners concluded that fracking was a beneficial enterprise. The affect model predicts that under those circumstances, individuals will reduce their perceptions of its risks accordingly. We found precisely that. For example, one interviewee explicitly

stated that after being promised millions of dollars in royalties, he readily accepted, not stopping to question the assurances of fracking's safety made by those persuading him to sign a lease. Another, who spoke of the economic benefits fracking brought to the community, and who said he would welcome a gas well on his property, dismissed any concerns about fracking risks as being rooted in ignorance or jealousy.

On the other hand, a few interviewees who said that their initial reactions to fracking were negative, were dismissive of any suggestions that their communities benefited economically or otherwise. Those who did acknowledge such benefits did so reluctantly. Those who had signed leases were quick to point out how little they received, and dismissed the idea that they were any better off for doing so. Once again, this aligns with the affect model, in which a person who perceives the risks of an activity to be high will have correspondingly low perceptions of its benefits (Slovic, 2007).

Given the very clear dichotomy between economic benefits and environmental risks that fracking creates, the affect model was predictably evident in our findings. We also found that interviewees who regretted that they signed leases, also tended to place blame for their decisions to lease on the promises of landmen and gas company representatives. Landmen have developed a reputation for engaging in unethical behavior in order to secure leases (Eisenberg, 2016), and our findings bear that out. We found that interviewees consistently accused landmen of using very similar tactics, such as deception and peer pressure, to induce residents into signing leases. Inflating the

potential financial gain, while downplaying potential harms, exploits the affect heuristic in a manner that makes it more difficult than it already is for people to understand the risks of an unfamiliar technology. Because this kind of exploitation goes beyond any individual landowner, and instead repeats itself across communities, there is the potential for substantial economic harm to a region (Eisenberg, 2016). Policymakers should take steps to regulate landmen far more strictly to mitigate the harm done by unethical leasing tactics.

3.5.2 The availability heuristic and diminished risk perception

As discussed above, studies have demonstrated that individuals premise their estimated likelihood of an outcome based, in part, on how easily they can bring to mind instances of that outcome (Schwarz, 1991). Individuals who can easily recall instances of a bad outcome will be expected to overestimate its frequency and, therefore, perceive the risks it poses as higher. But interviewing individuals within the fracking context, and outside of a controlled lab setting, revealed that while the availability heuristic plays a role in how risk perceptions are formed, the same easily recalled imagery can both increase and decrease perceptions of risk.

As the literature on the availability heuristic would predict, we found that interviewees identified the ubiquitous flaming faucet footage from *Gasland* as foundational in forming their perceptions of fracking's risks. That kind of shocking, affect-laden imagery lends itself to easy recall, and the movie associated it with the risks

of fracking. Several interviewees referenced *Gasland*, and correspondingly linked fracking activities with subsequent methane contamination in water wells.

Unexpectedly, however, the same footage that caused some interviewees to perceive fracking as dangerous had the opposite effect on interviewees who supported continued fracking development. These interviewees, when asked to offer opinions on water contamination issues, immediately brought up the same flaming faucet videos, which suggests that this imagery also came to mind easily for them. However, that easy recall did not, as the literature would suggest, correspond with an overestimation of frequency and increased perceptions of risk. Instead, knowing that faucets could be set alight prior to fracking's arrival, they associated this imagery with the notion that fracking concerns are overblown. Thus, easily recalling the imagery of flaming faucets appears to have consequently *diminished* their concerns about fracking, suggesting that the availability heuristic can push risk perception in either direction.

3.5.3. Proximity is a poor predictor of support or opposition

Research into the effect of geographic proximity on support or opposition of energy development has not produced consistent findings, and the not-in-my-backyard ("NIMBY") phenomenon cannot sufficiently explain attitudes towards particular projects (Boudet et al., 2013). Instead, Boudet et al., suggest that support has less to do with geographic proximity, and more to do with one's relationship with the development. Along similar lines, Alcorn et al. (2017), who performed a nuanced

quantitative analysis of the effects of proximity on support or opposition to fracking, conclude that attitudes related to the advantages and disadvantages of unconventional gas development are among the most important factors governing support or opposition. Our findings are in line with both Boudet et al., and Alcorn et al. We found that interviewees who were positioned differently with regard to fracking's benefits or impacts had very different perspectives on the safety of those operations. These findings suggest that the affect heuristic might be clouding the relationship between proximity and risk perception, at least in the fracking context.

But our findings offer another insight into why proximity is an inconsistent predictor of fracking support. Alcorn et al., conclude that "to more fully understand the role of distance in predicting perceptions, we need to understand what scale is most representative of a respondent's neighborhood or community with which they might share similar thoughts." (2017, p. 532). But establishing such a representative scale in the fracking context might not be possible, as we found that distance from a well is a very misleading metric with regard to predicting how fracking risks are perceived. Topographic features, such as hills and valleys, can significantly influence how a well's negative impacts are distributed, which means that one cannot simply draw a circle around a well, and assume that all residents within that circle experience impacts in the same way and to the same extent. Our findings caution against assuming that residents living the same distance from a well necessarily have the same relationship to fracking.

We did find, however, that there appears to be a relationship between geographic distance, risk perception, and empathy. Those who had lived in other parts of the country, or simply outside of fracking-intensive regions, admitted that they did not pay as much attention to the fracking issue until they were confronted with it. This perspective was echoed by those who had, in fact, been harmed by fracking operations, and found that those outside the area showed little empathy for what they had experienced. That lack of empathy, it would appear, corresponds with lower risk perception. One interpretation is that fracking's risks will not appear as significant to someone who is unable to truly empathize with people experiencing its effects. These findings are in line with Construal Level Theory, which suggests a relationship between increased psychological distance, a dimension of which is physical distance, and decreased concern for an issue or those impacted (Manning et al., 2018).

3.5.4 The relationship between risk perception and trust in government institutions

The literature has linked individuals' willingness to accept the risks posed by an activity and their trust in the government's ability to manage those risks (Slovic, 1993), something we found to be the case in the fracking context. Coupled with interviewees' concerns about the dangers posed by fracking is a corresponding distrust in DEP's ability to enforce its regulations in a manner that is sufficiently protective of the population. We found this to be the case amongst nearly all interviewees who expressed concerns about fracking risks. However, we found no such distrust among those who

considered fracking to pose few, if any, risks to human health and the environment. Thus, our findings are in line with the literature in the sense that a lack of trust in government institutions to manage the risks of fracking corresponds with concerns among residents about those risks. Interviewees who reported interactions with DEP were generally dissatisfied with the outcomes of those interactions. One interpretation of this dissatisfaction is that individuals who perceive fracking as being too risky for the government to manage will tend to interpret interactions with DEP or other agencies in a manner that reinforces their distrust (Slovic, 1993).

Based on our findings, distrust in government institutions, and DEP in particular, can be grouped into three, non-mutually exclusive categories. First, interviewees felt that the sudden proliferation of fracking wells rendered DEP unable to properly inspect as many wells as closely as they should. DEP has neither the staff nor the funding to adequately perform inspection and enforcement duties. Second, and relatedly, interviewees alleged that DEP personnel were not properly trained to monitor air emissions or private water wells. One interviewee theorized that most of the seasoned regulators had been hired by the industry early in the boom, leaving only inexperienced personnel to undertake inspection and enforcement duties. Finally, we found that frustration with DEP led to accusations of collusion with the industry. Interviewees alleged that state agencies were, among other things, failing to scrutinize

permit applications, failing to properly enforce regulations, and intentionally underreporting connections between drilling sites and contaminated water wells.

We found that interviewees in both the northeast and southwest corners of Pennsylvania alleged that state actors were suppressing information about the dangers of fracking in order to maintain the economic benefits these operations generate. Investigating the veracity of these allegations is beyond the scope of this study. However, to allege this kind of collusion goes beyond a mere lack of trust in the government to manage fracking risks, and implies a crisis of legitimacy.

3.6 Future research

The nature and swiftness of the fracking boom has yielded a unique confluence of factors that are known to influence how individuals perceive risk. For example, the potential for financial windfalls, the unequal distribution of externalities, the uncertain impacts on human health and the environment, and the aggressive media campaigns disputing those impacts, have all combined to frustrate residents' ability to understand the risks they face. Previous studies have isolated and demonstrated various cognitive mechanisms that influence risk perception, but much remains to be understood about how these mechanisms interact within such a complex context. For example, although our research found some evidence that cultural and political predispositions played a role in how interviewees perceived fracking risks (Kahan, 2012), further research is needed to understand how those predispositions interacted with the immediacy of the

risks. Along similar lines, conducting in-depth interviews with additional pro-fracking residents might yield insight into whether solution aversion (Campbell and Kay, 2014) might be playing a significant role in their perceptions of fracking risks. Embracing the fracking context's unique complexity, and engaging in in-depth research into the experiences of those living within it, can yield additional novel insights into the development of risk perceptions.

4. Use of fracking information disclosure policies to reduce uncertainty in risk-based decisions

4.1 Introduction

Even as the number of gas wells using hydraulic fracturing (“fracking”) techniques has increased dramatically in the United States, the risks fracking poses to human health and the environment, both in the short and long term, have not been established with certainty. But while the body of scientific knowledge about these risks continues to develop, the controversy surrounding its safety has raged in the media and online (Mazur, 2016). Although the gas industry argues that because the wells reach pockets of gas that are far below groundwater sources, they are no threat to private water wells (American Petroleum Institute, 2014), others argue that fracking causes a variety of harms, including water and air pollution, contaminated drinking water, soil erosion and sedimentation, noise, and truck traffic (Nolon and Gavin, 2013). Indeed, research has begun to emerge that suggests that fracking-related substances can and do reach water wells. Studies have investigated the presence of methane in drinking water near fracking wells (*e.g.*, Osborn et al., 2011), and explored exposure pathways and health effects (Adgate et al., 2014), but more research is necessary to understand the potential impacts on human health (Finkel and Hays, 2016). Understanding these risks is of particular concern to communities in a state like Pennsylvania, which has over 12,000 fracked wells, and where over three million of its residents rely on private wells for their water (Penn State, 2016).

The potentially serious consequences to human health and the environment posed by fracking have raised questions about the current state of fracking governance. Some aspects of fracking, and particularly horizontal drilling, may be subject to a number of federal environmental laws, but exemptions and limitations in the major federal environmental statutes have rendered federal regulation of fracking patchy and incomplete (Heusner et al., 2017). Nevertheless, the task of regulating oil and gas extraction has traditionally fallen to the states, and those with fracking within their borders, such as Pennsylvania, have enacted regulations to govern it. These state regulations are considered “cradle-to-grave” in the sense that they cover everything from exploration and drilling to abandonment and well plugging (Cricco-Liza, 2012). In addition, several states have passed or are considering mandatory chemical disclosure laws that would require fracking operations to publish a list of chemicals used in their fracking fluids.

Despite the comprehensiveness of the state regulations, residents may struggle to assess their effectiveness in protecting human health and the environment. For example, by one estimate, there have been 13,769 violations assessed to fracking well sites since 2008 in Pennsylvania alone.¹ But the nature of these violations is not specified, and the compliance database maintained by the Pennsylvania Department of Environmental

¹ FracTracker alliance website, count updated as of January 9, 2020. *Available at:* <https://www.fractracker.org/map/us/pennsylvania/pa-shale-viewer/>

Protection (“DEP”) tracks violations of state regulations that vary considerably in severity, ranging from permitting issues or inadequate fencing, to spills or improper well casing.² When combined with the well-publicized controversy surrounding fracking’s safety, the lack of transparent risk information provided by the state leaves residents struggling to understand the risks they face.

Although there is a substantial body of research exploring the perceptions of, or public support for, fracking itself, (*e.g.*, Alcorn et al., 2017; Howell et al., 2017; Boudet et al., 2014; Kriesky et al., 2013), few have examined how residents perceive the laws and regulations that are in place to protect them from its risks. This paper addresses this gap in the literature by using in-depth interviews to examine: (1) how residents in affected communities perceive the effectiveness of fracking regulations, and the state agencies tasked with enforcing them; and (2) how residents draw conclusions about fracking risks in the face of inconsistent and controversial safety information. We draw from scholarship on the use of information disclosure as a regulatory tool to discuss the need for increased information transparency in the fracking context. We then consider the implications of using this policy tool, as well as its reliability and comprehensibility. Finally, we propose the targeted use of transparency policies to address different fracking-related information asymmetries identified by our research.

² See Pennsylvania Department of Environmental Protection for information on violations: http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/Oil_Gas/OG_Compliance

4.2 Information disclosure as a policy tool

Policymakers have a variety of tools from which to choose when fashioning environmental laws and regulations. Among the most common are command-and-control regimes, taxes and subsidies, and liability schemes (Hamilton, 2005). Although command-and-control has been the dominant form of regulation since the 1970s, its use has fostered no small amount of criticism for being inflexible and inefficient (Case, 2005). In response, information disclosure has emerged as a favorable, less burdensome alternative to more rigid, and less efficient, policy instruments. It relies on the government mandated collection and publication of data about a regulated entity's operations, rather than, for example, on establishing and enforcing emission or discharge limitations (Gupta, 2008). Market forces and public opinion thus complement or displace government regulation, easing the burden on both government agencies and regulated entities (Case, 2005). Although not a panacea, information disclosure policies can effectively reduce pollution, even in the absence of other, concurrent regulation. In theory, the goal of information disclosure is to align firm goals with societal values, such that the firm internalizes social norms and behaves accordingly.

Information is a public good, and, theoretically, firms will have little incentive to invest funds into gathering, organizing, and publishing environmental performance information unless mandated by the government (Hamilton, 2005). In addition to the

costs involved, doing so might draw inspectors' attention to instances of noncompliance, or expose the firm to liability. Likewise, there are legitimate concerns that the general public might confuse emission with exposure, and fear negative health effects that experts would consider minimal or nonexistent. Finally, the availability of this information might raise investor concerns about future liability costs, regulatory compliance costs, and the potential loss of goodwill. Scholars have contended that increased access to more in-depth information does influence firm behavior, either as a result of actual pressure or the fact that transparency makes such pressure more feasible. Threats to a firm's reputation among consumers that arise from increased visibility of environmental performance create an incentive to improve in that arena (Nyilasy et al., 2014).

Requiring regulated entities to generate environmental data is nothing new, however, and has long been a component of regulatory programs such as that of the Clean Air Act, where it is an integral component of both the Act's command-and-control and market-based schemes (Hamilton, 1995). But information forcing as a regulatory mechanism in and of itself has gained favor as a means of incentivizing regulated entities to adopt more environmentally friendly practices without forcing regulated entities into a burdensome and inefficient one-size-fits-all regulatory scheme (Fung et al., 2007). Letting the market encourage improved environmental performance can be a

politically viable middle ground between competing views on how much the government should be tasked with solving problems (Adler, 2012).

A primary example of this information-forcing approach in the environmental context is the Emergency Planning and Community Right to Know Act (“EPCRA”) (Hamilton, 1995). Pursuant to EPCRA, regulated facilities must report releases and transfers of certain hazardous chemicals to the Environmental Protection Agency, which in turn maintains the Toxic Release Inventory (“TRI”), a database of these releases made available to the public. Studies undertaken since its inception indeed suggest that TRI reporting has had a cognizable effect on the stock prices of covered facilities (Konar and Cohen, 1997), and reduced overall emissions of covered substances (Karkkainen, 2000). Both the public and policymakers have interests in the disclosure of information related to the nature and release of chemicals (Gosman, 2013). The public is concerned about being exposed unknowingly and involuntarily to potentially harmful chemicals, and disclosure satisfies their right to know. Likewise, policymakers must have sufficient information to understand the scope of the issue, and what solutions might be best suited to address it. Increased information availability may drive regulated entities as a result of a number of factors, including both internal and external pressure to improve environmental performance, and the fear of reputational damage that may accompany disclosure of poor performance (Hamilton, 2005, *citing* Stephan, 2002).

But effective environmental disclosure programs require more than simply making certain environmental performance information available to the public. Fung, Graham, and Weil (2007) identify two primary factors that determine the success of these programs: the programs must be user-centered, and they must be sustainable (Fung et al., 2007). With regard to the second factor, information disclosure policies must progress over time such that they become more accurate, broader in scope, and their results are more regularly incorporated into user decision-making. With regard to the first factor, the relevant population not only has to be able to understand and incorporate the information in a meaningful way, but that information must also coincide with choices that the target audience would make (Issacharoff, 2011). That is, programs must be designed with the user in mind, such that the information generated can be incorporated into relevant decision-making (Fung et al., 2007). Three factors in determining whether users will, in fact, incorporate the information as desired: 1) the information's perceived value with respect to users' goals; 2) its compatibility with how they make decisions; and 3) its comprehensibility. A significant obstacle to the usefulness of disclosed information is users' ability to meaningfully understand it, a problem that plagues risk communication more generally. Owing to a variety of cognitive mechanisms, the general public's risk perceptions tend to depart from how experts assess risk (*See, e.g.,* Walker-Wilson, 2011). As a result, information regarding environmental performance will be ineffective if not translated into risk information that

the general public can use to make decisions in line with their individual values and risk tolerance (Fung et al., 2007). Failure to do so may render the program counterproductive. Furthermore, with newer chemicals, science may not yet have sufficient data to offer meaningful risk assessment, raising the specter of increased confusion and controversy (Gosman, 2013). An information transparency program that fails to mitigate such confusion will erode trust in public and private institutions (Fung et al., 2007).

4.3 Risk perception and the use of risk-based information

It has been long established that when assessing the risks something poses, people rely on quick, intuitive judgments, rather than empirically derived risk assessments. Scholars have conducted considerable research into the cognitive mechanisms that inform how people form perceptions of risk (*See, e.g.* Sjöberg, 2000; Slovic et al., 1982). For example, the affect heuristic (Slovic, 2007) operates by triggering quick, emotional valuations of a given risk target that map along what may be simply described as a good-bad spectrum. These perceived risks and benefits have been shown to be inversely correlated, and operate in both directions. That is, if an individual perceives the risks from a particular target to be high, that individual will, in turn, perceive its benefits to be lower. On the other hand, an individual who perceives the risks to be low will correspondingly tend to perceive the benefits as being higher. The

reverse is also true, as individuals who see considerable benefits will perceive less risk, and *vice versa*.

Relying on intuitive mechanisms such as the affect heuristic can lead individuals to draw conclusions about risk information that differ from those of expert risk assessors (Breyer, 2009). But although the general public may not necessarily use risk information in the most efficient or desirable way (Slovic, 1997), there remains an economic argument in favor of ensuring that information is available, nonetheless. In a 1996 proposed rulemaking, EPA stated that failure to incorporate externalities and information asymmetries were two factors that contributed to market failures, and stressed the importance of this information being available to the public in order to aid them in making decisions in line with their risk preferences (Hamilton, 2005). Risk preferences reflect the willingness to take on risks (Charness, Gneezy, and Imas, 2012), and are informed by perceptions of those risks.

How individuals perceive risk is not only relevant to support or opposition to a particular technology or activity, but those who are subject to certain types of risk can also experience negative health effects resulting from increased stress brought on by feeling exploited, ignored, or helpless (Ferrari et al., 2013). However, those stress-related symptoms can be ameliorated by increased communication and transparency about the risks. As a result, emerging risk governance theories seek to include communication and stakeholder engagement as important components as part of the risk management

process (Sidortsov, 2014). This type of engagement not only increases trust in governing institutions, but also serves to reduce the perception of risks from new technologies.

4.4 Methods

Previous research on the perspectives of residents living in communities affected by fracking had not examined in depth how residents perceived the regulations and regulatory agencies governing fracking. Therefore, the purpose of the research presented here was exploratory. The research sought an in-depth understanding of individuals' experiences with fracking that could lead to the development of theories about how they interpret the effectiveness of fracking regulations and the agencies charged with enforcing them (Strauss and Corbin, 1998). The researcher used semi-structured interviews to conduct this study, and subsequent analysis of the interview data adhered to the grounded theory method, which is ideally suited to developing new theories directly from data (Timonen et al., 2018).

4.4.1 Location selection

Although fracking operations occur in several states, Pennsylvania was uniquely suited to the exploration of the study's principle questions (Robinson, 2014). Pennsylvania has thousands of fracked wells, and many of its residents have complained of significant groundwater contamination incidents that they attribute to fracking. Additionally, Pennsylvania has developed regulations specifically tailored to fracking. Finally, the intensification of gas development in Pennsylvania during the last

15 years allows for the opportunity to explore how individuals perceive the consequences of this rapid development. Fracking has been most intense in the northeastern and southwestern portions of Pennsylvania, so interviews were divided among residents living in those two areas.

4.4.2 Data collection

Study participants were selected purposively to ensure interview data was relevant to the questions of interest, which focus on individuals living in the context of a particular phenomenon (Cleary et al., 2014). Therefore, the study included only participants who lived in communities subject to the risks posed by fracking activities. Interview participants were identified using both convenience sampling, whereby qualified participants were identified by happenstance (Robinson, 2014), and snowball sampling, in which participants are asked to recommend other potential participants. Snowball sampling is particularly suited to situations where participants may be hesitant to respond to calls to interview due to the controversial nature of the topic (Robinson, 2014). Interviewing proceeded until concepts and themes elicited from subsequent interviews became redundant, which signals saturation (Cleary et al., 2014). This process ultimately yielded a sample size of 38 interviews (33 of which were recorded) consisting of 47 individuals, representing a variety of economic and professional backgrounds, which included farmers, teachers, small business owners, and mechanics.

Interviews typically lasted between 30-75 minutes. Those participants who consented to being recorded were provided with a consent form, a copy of which was signed and returned to the researcher. This consent form had been reviewed and approved by the Institutional Review Board prior to conducting any interviews in order to ensure protection of those participating in the study. Interviews usually began with the researcher asking participants to offer general thoughts on fracking. The prompt was open-ended in order to get detailed background information on what experiences, if any, participants had with fracking. Subsequent questions varied based on previous answers, but all interviews included topics related to sources of information about fracking, perception of its risks, perception of regulations and regulators, and interpretation of lawsuits and legal outcomes. A sample of interviewee responses to these questions is included in Appendix A.

4.4.3 Analytical approach

At the conclusion of interviewing, the recorded interviews were transcribed verbatim, and each participant was assigned a unique identification number. In instances where an interview included more than one participant, letters were appended to the identification numbers to indicate the different speakers. These identification numbers are used for citation purposes below. The interview transcripts were imported into NVivo, a qualitative data management platform, for coding and analysis. An extensive review of risk perception literature had informed initial topics and codes,

which were developed prior to interviewing. Additional codes were then developed during the course of interviewing, as new themes began to emerge. Those themes, in turn, informed subsequent theoretical sampling efforts, and facilitated the continued emergence of additional themes (Timonen et al., 2018). Once the transcripts were imported in NVivo, the researcher coded the entire data set, line-by-line (Charmaz and Belgrave, 2007). This process, in turn, yielded additional codes, which were then grouped into concepts, categories, and themes.

4.5 Results

We found that while interviewees were frustrated with several aspects of fracking and its governance, there was a nearly universal desire for more and better information about the risks it poses. Our results are organized around (1) the types of risk-based information interviewees considered insufficient; and (2) how that insufficiency affected risk perception and decision-making.

4.5.1 Risk-based information

4.5.1.1 The overall safety of the fracking process

Interviewees expressed that they were uncertain about the risks of fracking, particularly when it was still new to the region. Because concerns about the potential harm to human health and the environment began to surface quickly, interviewees reported that gas company representatives often held community meetings in order to assuage these concerns and encourage residents to sign leases. Interviewees, some of

whom signed leases, maintained that landmen or gas company representatives assured them that fracking had been going on for decades, and that the new techniques only made the process safer. They reported that these assurances were a consistent component of the leasing discussions with landowners, and something that played a role in many residents' leasing decisions. Landowners were told the process would be completed in a matter of months, and would be minimally disruptive to their lives and properties. Finally, interviewees were told by industry representatives that fracking fluid was composed almost entirely of water and sand, along with a very small percentage of chemicals that were similar to the kinds of chemicals found in toothpaste or makeup.

4.5.1.2 The composition of fracking fluids

Despite industry claims about fracking fluid's safety, our research found that interviewees considered the gas companies' ability to keep its precise composition secret to be a significant hindrance to residents' understanding of the risks fracking poses. The use of trade secret protections to keep fracking fluid constituents from being publicly disclosed has garnered national attention, and interviewees expressed concerns about not knowing what potentially hazardous substances might be in those fluids. They varied in how well they understood the fluid disclosure rules, but were cynical of the legitimacy of the companies' stated need for trade secret protections. Interviewees considered those claims to be a way to hide the fact that the fluids were hazardous, and

that they were contaminating residents' water wells. Interviewees stated that because the fluid compositions were being kept secret, neither residents nor their doctors could identify the substances to which they were exposed. Their concern was that it not only amplified residents' health risks, but made it more difficult for them to prove a connection to a specific gas well were they to seek legal compensation.

4.5.1.3 The frequency and severity of spills and releases

Interviewees consistently expressed that they desired more complete information regarding spills of produced water and other fracking-related liquids. Although DEP maintains a searchable database of compliance reports,³ interviewees complained that this data was incomplete or difficult to navigate. Likewise, interviewees felt as though DEP lacked the resources to monitor fracking activities to the degree necessary to catch violations, or at least to sufficiently incentivize consistent self-reporting. Interviewees also opined that spill data was incomplete or unavailable simply because the gas companies do not report all spills to DEP, and expressed a general cynicism that gas companies would report spills that they could clean up without DEP being notified. But without DEP supervision or awareness, interviewees questioned whether these hasty cleanups would be sufficiently thorough to remove the possibility of hazardous substances getting into waterways. Thus, they expressed concern that spills were being

³ Available at:
<https://www.dep.pa.gov/DataandTools/Reports/Oil%20and%20Gas%20Reports/Pages/default.aspx>

severely underreported. In addition to accidental spills, several interviewees alleged that, in order to avoid detection, gas companies intentionally committed violations at night, on weekends, and on holidays, which are times when DEP inspectors are unlikely to be working. Likewise, they speculated that both water and air emissions are deliberately synchronized with rainfall in order to avoid detection.

Finally, interviewees alleged that information about the impacts of spills, along with any other incidental harms caused by fracking activities, was being obscured by the systematic use of nondisclosure agreements (“NDAs”) to settle claims made by residents. When, as a result of water contamination issues, residents sued gas companies, or even complained informally, they were compelled to sign NDAs in order to get water replacement or financial compensation. These NDAs, interviewees said, barred the injured parties from discussing any details of the incident with anyone. This systematic use of NDAs is well known amongst interviewees, and left them to wonder how many people in their communities had experienced water issues, but were contractually obligated never to speak about it.

4.5.1.4 Frequency and adequacy of water and air monitoring

Concerns about the composition of fracking fluids, and the frequency of spills, dovetail with the frustrations that interviewees expressed about the frequency and adequacy of private well water testing. Although baseline testing prior to drilling is potentially beneficial to both residents and industry, it does not always occur.

Pennsylvania law establishes a rebuttable presumption of fault for contamination of any water wells located within a 2500-foot radius of a gas well, if that contamination occurred within twelve months of the gas well being drilled.⁴ But interviewees pointed out that having a private water well tested is expensive. Because many of the people living in communities impacted by fracking are at the edge of poverty, paying thousands of dollars for a water test is not feasible. Paying that much for periodic tests is simply impossible. But as interviewees noted, unless regular tests are performed, a person might be exposed to contaminated water for a significant period of time. Even for those individuals who do get their water tested, the results may be of limited value, at least with respect to assessing the risk to their health and safety. “Well the gas company checks it. Right after they check it, I had a private individual come check mine. I got all the reports, but who can read it? You gotta be a scientist to read it.” (1402-A) Even if a water test were to include a risk assessment for each constituent present, it still may not provide sufficient information for an individual to understand those risks in a meaningful way. Interviewees who showed their test results to the researcher acknowledged being unable to interpret what they meant in terms of the safety of their water.

⁴ 58 Pa. Code § 3218(c).

Interviewees also stated that some water tests did not screen for all the substances that might reasonably be found in a well that had been contaminated. They claimed that DEP's water tests, in particular, were not comprehensive, and would fail to include screening for radioactive materials and other heavy metals associated with the fracking process. Nevertheless, interviewees alleged that DEP would run these incomplete tests, and then tell residents that their water was safe to drink. In order for DEP to conduct a more comprehensive test, interviewees claimed that they needed to explicitly make that request. Failing to do so, they worried, meant that the test results might be of limited value in terms of detecting all potential health risks.

In addition to incomplete water tests, interviewees alleged that DEP was, intentionally or otherwise, underreporting instances in which a connection could be made between drilling activities and a contaminated well. DEP maintains a database of water determination letters, which document instances in which oil and gas activities were found to have impacted private water wells.⁵ As of November 25, 2019, there were 346 such determinations. However, interviewees insist that these represent only a fraction of the instances in which fracking activities have impacted private water wells. They claim that DEP either deliberately underreports these instances, or it narrows its criteria for water determinations in a manner that makes finding a connection between

⁵ Available at:
http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/OilGasReports/Determination_Letters/Regional_Determination_Letters.pdf

fracking activities and a contaminated well very unlikely. Interviewees also allege that citizen access to DEP files related to fracking have become much more restrictive, further underscoring the diminished trust they have in the regulatory agency charged with enforcing fracking regulations.

Although water contamination issues have thus far garnered more media attention, interviewees cited air emissions from fracking activities as being both a nuisance and a cause for concerns about long term health effects. But as was the case with water testing, several interviewees expressed frustration at being unable to obtain reliable air tests. Furthermore, some air quality problems result from occasional, but severe, emissions that are temporary by nature. Thus, air quality requires consistent monitoring in order to accurately gauge exposure. As a result, residents are often unable to determine the airborne substances to which they are being exposed, and for how long. As was the case with water testing, interviewees were unhappy with DEP responses to complaints about emissions coming from well pads. Interviewees stated that DEP representatives often arrived to investigate emissions complaints many days later, after the severity of the situation had decreased significantly. They also reported that DEP personnel came to investigate without the proper air monitoring equipment, such as FLIR gas imaging cameras. Even though interviewees felt that neither state officials nor gas company representatives were helpful with air monitoring efforts, they noted that non-profit organizations, such as the Southwest Pennsylvania Health Project,

will conduct air quality tests for residents living near fracking operations. But as was the case with water testing, the results of air monitoring were technical, and interviewees acknowledged being unable to understand what the results meant in terms of the risks they faced.

4.5.2 Impact of safety information on risk perception and decision-making

Interviewees wanted more and better information given to them in a sufficiently timely manner, in order to use it to make risk-dependent decisions. Decisions associated with buying property near fracking activities, or leasing their own property to gas companies, could and did have significant consequences for interviewees. How they approached those decisions was informed, in no small part, by how they understood the risks posed by fracking. We found that in the absence of reliable information from sources they trusted, interviewees' perceptions of fracking risks appeared to be influenced by the mechanisms identified in the risk perception literature. For example, in line with the affect model of risk perception (Slovic et al., 2000), the information that interviewees who signed leases received about fracking's economic benefits decreased their concerns about its risks:

Hey, welcome, come on in, would you like to put that on my front porch? I'll take it right in the front yard, backyard, you could even put it through the house, I don't care, it sounds great. ... I'm a cheerleader. I'm looking at my money. I'm blinded by the money and the promise of, and he assured me that just sand and water went down into the hole. ... Pretty easy to trust four people that come in and say 8-13 million dollars! ... The hook was set and all they had to do was reel me in. (1317)

Other interviewees, who bought property in communities that were already affected by fracking activity, felt as though they did not have the information necessary to protect themselves from its risks. These interviewees alleged that the gas industry intentionally keeps project information secretive in order to minimize opposition before permits have been issued, and it is too late to stop development. They stated unequivocally that such project information would have played a significant role in deciding whether to purchase their homes and property. When asked whether, knowing what they knew now, they would buy their property again, even at a significant discount, each said that they would not do so:

Oh my gosh, you know what, if seriously if I had known we wouldn't have bought it, no matter how badly we wanted this property. If I had known there was a gas well that close, we would not have bought it. I mean it's scary. (1233)

4.6 Distillation of key findings, and recommended policy interventions

Emerging technology that comes with unknown or controversial risks can expose flaws in a regulatory regime that has been implemented before the risks from that activity have been sufficiently established. The goal of this research was to examine: (1) how residents in communities affected by fracking perceive the effectiveness of both fracking regulations and the state agencies tasked with enforcing them; and (2) how residents draw conclusions about fracking risks when confronted with inconsistent and controversial safety information. In this section we briefly distill the findings of the

study before proposing a non-exhaustive list of policy solutions to mitigate their potential ramifications.

4.6.1 The desire for reliable information on fracking risks

Although interviewees did raise concerns about other regulatory issues, such as minimum well setbacks, they overwhelmingly expressed a desire for more transparency about many aspects of fracking. The most important information can be grouped into three primary categories: (1) what substances are implicated in the fracking process, from start to finish; (2) how often do spills and releases occur; and (3) how can residents know whether they are being exposed to hazardous substances to the extent that their health might be put at risk? These categories represent a distillation of the kinds of risk-related fracking information that residents living in these communities would consider valuable in making decisions pursuant to their own risk preferences.

4.6.2 Policy interventions to mitigate the information deficit faced by residents

We propose a non-exhaustive series of policy interventions that will help mitigate interviewees' frustrations with the perceived lack of reliable and usable risk information. These proposals are not only informed by the information disclosure literature, but instead take into account what individuals living in this context expressed in terms of what they considered important to know. Incorporating insights from their experiences gives these proposals a practical, rather than purely theoretical, grounding.

The proposed measures aim to increase transparency of risk information, while at the same time providing it in a manner that will be comprehensible and accessible. It is important to recognize that increasing information does not necessarily mean that the public will use that information correctly, or even use it at all (Fung et al., 2007). However, the fact that the public might interpret this information in a manner that brings their risk perceptions out of line with expert risk assessments is not sufficient justification for denying them this information. People must be free to make decisions in line with their risk preferences, even if those decisions might appear irrational to some (Hornstein, 1992; Wilson 2011). Measures that increase information generation and dissemination are uniquely appropriate in the fracking context for two important reasons: (1) public policy favors individuals being empowered to make informed decisions; and (2) given the uncertainty and controversy surrounding the issue of fracking safety, information disclosure offers the benefit of shedding light on the potential impacts on human health and the environment, while remaining less burdensome to gas well operators than other regulatory tools.

4.6.3 Trade secret patent for fracking fluids

Currently, gas companies can claim trade secret protection to avoid having to disclose the precise chemical makeup of the fracking fluids they use. The policy justification is that these fluids are tailored to maximize the hydrocarbons that can be extracted during the drilling process, and to make the formulas public would create a

situation in which the energy and resources spent by one company developing the most effective formulation would go unrewarded if other companies knew its precise formulation (Craven, 2013). Although Pennsylvania is among the states that now require disclosure of chemicals used in fracking fluids, drillers are still able to avail themselves of trade secret protections to keep some of those chemicals secret (Cramer, 2016).

Policymakers should remove trade secret protections, and instead encourage gas companies to patent their formulas (Craven, 2013; Wiseman, 2011). Doing so will protect investments made by gas companies in researching and developing uniquely tailored fracking fluids, while at the same time allowing for more thorough disclosure of information critical to human health and the environment. Several scholars have speculated that unique fracking fluid combinations would satisfy the patent requirements, which would give them the legal protection that underlies the trade secret exemptions of which operators current avail themselves (Craven, 2013; Wiseman, 2011). With the legal protection that accompanies a patent, companies' concerns about others benefiting from their investments in research and development will be obviated. Fracking fluid compositions could then be disclosed more fully to state and federal regulatory bodies in a manner that allows for additional risk assessment to be performed. This transparency would alleviate resident concerns that current attempts to keep fluid composition from being disclosed arises from companies' awareness that

these fluids pose a serious threat to human health. Despite the additional time and expense involved in seeking to patent fluid compositions, it is a solution that balances intellectual property and economic protection with the public's interest in having information about potential health risks.

4.6.4 Creation of user-friendly spill and violation databases

Because information related to spills of fracking fluids and other potentially harmful substances is critical to citizens being able to make informed decisions related to their health, safety, and financial well-being, Pennsylvania should require that its DEP maintain a user-friendly database that includes release data such as substance, volume, location, and cleanup status. Although Pennsylvania requires that operators report releases of regulated substances that exceed five gallons in volume,⁶ the DEP website does not provide a database that citizens can easily navigate to find information related to spills. Even those interviewees who reported regularly searching for this kind of data struggle to find it on DEP's website. As Fung et al. (2007) argue, information disclosure tools must be comprehensible to the public in order to be effective. Because Pennsylvania citizens actively searching for release information report struggling to find it in a form that can be used in decision-making, the current database fails the criteria set forth by Fung et al. (2007). To ensure the availability of release information, and bolster

⁶ 25 Pa. Code § 78a.66(b)(ii).

the credibility of that information, DEP's website must present it in a manner that is both comprehensible and reasonably usable.

Some may argue that maintaining such a database would further incentivize gas companies not to report releases to DEP. While it is likely that increased transparency will change the gas companies' risk reporting calculus, this concern can be ameliorated by a corresponding increase in penalties for failure to report releases.

While a well-tailored release database can provide information about potential contamination, a similarly comprehensive violations database would alert citizens to operators' records of noncompliance. Although DEP does currently maintain a database of violations that is searchable by region, date, and operator, this database is neither easily navigable, nor useful as a means of drawing conclusions about operator performance. For example, the database does not offer options to narrow results related to violations that might implicate human health or the environment. Results listed under the "environment and safety" category include violations such as improper erosion fencing, which are unlikely to be of much interest to most citizens. Sorting through these kinds of citations to find useful violation data requires more time and energy than many people can afford. DEP should redesign its compliance database in a manner that allows users to search more easily for the kinds of violations they will find useful in decision-making.

4.6.5 Mandatory pre-drilling baseline testing for water and air

Both industry and residents would benefit from improved, expanded, and more widely available water testing data. Pennsylvania should begin by mandating baseline water testing for residential water wells within 3000 feet of any planned gas well. The results of that testing should be provided to the drillers, the individual residents, and DEP. Baseline water data not only serves to alert residents to changes in their water quality, but it also protects industry from erroneous claims that their activities led to contaminated well water. Baseline data is also critical for drillers attempting to challenge the rebuttable presumption of fault for water issues that occur within 2500 feet of a drilled well.

To combat allegations that DEP is deliberately underreporting instances of water fracking-related water contamination, its water testing procedures must be both well-calibrated and transparent. Evaluating DEP's precise water testing protocols is outside the scope of this chapter. Instead, this chapter is concerned with what steps DEP can take to ensure that residents are confident that water testing is sufficient to identify any potentially hazardous substances that are present in their water. The current practice tailoring water testing analysis to include only a subset of the substances that are potentially indicative of fracking-related contamination likely fuels the concerns among residents that DEP's tests are inadequate (Legere, 2013). DEP should establish a comprehensive framework for handling water well contamination complaints that

ensures transparency and consistency of the process (Cranch, 2014). Ensuring that there is transparency throughout the process, from initial complaints to final determinations, should help mitigate concerns about legitimacy. As a first step, DEP should track the number of complaints made about water quality on a per water well basis, and that data should be published on DEP's website in a manner that allows users to compare those figures to the number of water determination letters issued.

Furthermore, DEP should provide qualitative information about the nature of each complaint, along with DEP's conclusions about whether fracking activities are to blame for any change in water quality. In instances where DEP does not connect water quality change to fracking activities, a brief explanation should be provided that distinguishes between findings of no connection, and instances where a connection is inconclusive. That is, a visitor to the website should be able to read about the nature of a complaint, DEP's determination, and in the event of a negative determination, a brief explanation that distinguishes between no connection and an inconclusive connection. Even if the difficulty in making a definitive connection (Alawattegama, 2015) accounts for a significant discrepancy between the number of complaints and the number of water determination letters citing such a connection, DEP needs to track and publish this data in a manner that is comprehensible to and usable by members of the public.

In addition to standardized baseline water testing, similar requirements should be instituted for air monitoring. Prior to drilling, air quality should be tested in areas

around homes or businesses within three miles of a well in all directions. Upon commencement of drilling, permanent air monitors should be installed to ensure that representative samples are taken on a regular basis. While water wells need to be monitored individually, air monitors can detect hazardous emissions that might be impacting a broader area, and need not be installed on a residence by residence basis.⁷

4.6.6 Conditions on nondisclosure agreements for fracking-related settlements

The principle issue with nondisclosure agreements in the fracking context is that allowing private parties to restrict the right of an individual to disclose threats to public health runs counter to public policy (Fisher, 2015). But at the same time, the freedom to contract and the right to privacy are important policy goals, as well. In order to balance these competing policy concerns, Pennsylvania should consider conditioning the enforceability of NDAs used to settle fracking-related water contamination claims on the submission of a document to DEP that sets forth the details of the claim. That is, in order for an NDA to be enforceable, the parties must provide details such as the nature of the claim and the approximate location. That information would be maintained by DEP in a publicly accessible database. Failure to submit this information would render unenforceable any NDA included in a settlement contract. A database of this kind

⁷ This may not be true in all areas of rural Pennsylvania, as homes are not always located within a mile of each other. But a standardized spacing requirement would apply, nonetheless.

would preserve the enforceability of NDAs, without facilitating the suppression of information critical to understanding risks to human health and the environment.

4.7 Future research

The body of knowledge related to fracking's potential harm to human health and the environment continues to evolve, leaving policymakers to grapple with scientific uncertainty in an atmosphere already saturated by public opinion. Because there has already been substantial research into general support for or opposition to fracking, we suggest that future research look to residents' experiences with fracking and its governance for additional insight. Understanding the effectiveness of regulations and regulators, from the perspective of those they are meant to protect, can offer the opportunity to fine tune policies that were put into place when knowledge about fracking risks was minimal.

Now that the fracking boom is more than a decade old, residents in communities affected by it have had time to reflect on their experiences. Residents' experiences with government agencies tasked with enforcing fracking regulations can highlight the issues they have faced with fracking, and expose the weaknesses of the regulatory regime. But parallel research should also investigate the perspectives of state lawmakers and regulators to identify any disconnects between how government officials and residents view issues related to fracking governance. It may take some years before we have

enough empirical data on fracking's risks to quiet the controversy over its safety, but research that contributes to improved fracking policy need not wait so long.

5. Nondisclosure agreements and the unlikely convergence of sexual harassment and fracking toxic tort claims

5.1 Introduction

Although the issue of sexual harassment in the workplace is nothing new, its pervasiveness had managed to remain severely underreported when in October 2017, a Twitter post encouraged women to reply “me too” if they had been subject to sexual assault or harassment.⁸ Within 24 hours, the hashtag #metoo had been used millions of times on social media, igniting what has been dubbed the “MeToo movement.”⁹ The Twitter post came in the wake of a New York Times article exposing allegations of sexual assault made against Harvey Weinstein.¹⁰ In the weeks that followed, additional allegations were made against Weinstein, and against other powerful men in entertainment, politics and other industries.¹¹ As the allegations mounted, it came to light that Weinstein had entered into a number of nondisclosure agreements (“NDAs”) with his accusers that prevented them from speaking out about the alleged behavior.¹² Similar agreements were used to prevent details of sexual misconduct allegations

⁸ L. Camille Hébert, *Is “MeToo” Only a Social Movement or a Legal Movement Too?*, 22 EMPLOYEE RIGHTS & EMP. POL’Y J., 321-22 (2018).

⁹ *Id.* at 321.

¹⁰ Elizabeth C. Tippet, *The Legal Implications of the MeToo Movement*, 103 MINN. L. REV. 229, 231 (2018).

¹¹ *Id.* at 231-32.

¹² *Id.* at 234.

leveled against Bill O'Reilly from being publicized.¹³ The media coverage of allegations made against these and other powerful men, along with the initial flood of posts on social media, encouraged more women to speak up about the sexual misconduct to which they have been subjected, and raised questions about how this kind of behavior continues unexposed. This increased scrutiny on how companies¹⁴ respond to sexual harassment allegations has had a cognizable impact in a relatively short period of time. In the past two years, companies have had to grapple with a new reality in which a failure to adequately respond to allegations of sexual harassment invites negative publicity, as well as potentially serious reputational damage.

A few years earlier, in another corner of the legal world, the media began reporting that a natural gas company had stated that it would enforce an NDA, which had been included as part of a settlement related to hydraulic fracturing (“fracking”), against the minor children whose parents had brought the suit.¹⁵ Not surprisingly, the idea of a natural gas company enforcing a gag order on children under ten brought notoriety to the case, and drew attention to the use of NDAs in the context of fracking. However, despite the media coverage of this unusual situation, it does not appear to

¹³ Ramit Mizrahi, *Sexual Harassment Law After #MeToo: Looking to California as a Model*, 128 YALE L.J. FORUM 121, 133-34 (2018).

¹⁴ This chapter uses the term “company” as a general label referring to all organizations, public or private, for profit or otherwise.

¹⁵ Don Hopey, *Hallowich Children Not Part of Marcellus Shale Gag Order Agreement*, Pittsburgh Post-Gazette (Aug. 7, 2013), available at: <https://www.post-gazette.com/local/washington/2013/08/07/Hallowich-children-not-part-of-Marcellus-Shale-gag-order-agreement/stories/201308070133>.

have diminished the use of NDAs in this context, nor did it prompt a significant backlash against the industry. Although the use of fracking¹⁶ to stimulate wells has taken place since the 1940s, combining it with horizontal drilling techniques in the late 1990s revolutionized the energy extraction industry.¹⁷ Vast unconventional shale reserves, which had previously been considered economically unfeasible for extraction, are now accessible.¹⁸ Consequently, the United States has seen a considerable increase in natural gas production since the early 2000s.¹⁹ However, this development has not been without controversy. A vocal anti-fracking movement has emerged, arguing that fracking is a serious threat to human health and the environment.²⁰ Critics cite myriad concerns, including air pollution, surface and groundwater pollution, dangerous truck traffic, road damage, noise, and earthquakes.²¹ Proponents of fracking, on the other hand, argue that many of these claims are anecdotal, and that studies definitively connecting fracking activities to water contamination, for example, are lacking.²² Nevertheless, a number of lawsuits have been filed, alleging, among other things,

¹⁶ The term “fracking” is used to refer to all activities associated with unconventional shale gas development -- from drilling to well plugging -- and not merely the injection of fluids underground at high pressures to stimulate wells.

¹⁷ Adam Garmezy, *Balancing Hydraulic Fracturing’s Environmental and Economic Impacts: The Need for a Comprehensive Federal Baseline and the Provision of Local Rights*, 23 DUKE ENVTL. L. & POL’Y F. 405 (2013).

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ John R. Nolon & Steven E. Gavin, *Hydrofracking: State Preemption, Local Power, and Cooperative Governance*, 63 Case W. Res. L. Rev. 995, 998 (2013).

²¹ *Id.*

²² David B. Spence, *Responsible Shale Gas Production: Moral Outrage vs. Cool Analysis*, 25 FORDHAM ENVTL. L. REV. 141, 145 (2013).

negligence, nuisance, trespass, and strict liability, arising out of claims of bodily injury or property damage.²³

Although fracking has become a household word thanks to the documentary, *Gasland*, the movie, *Promised Land*, and the involvement of celebrities such as Mark Ruffalo,²⁴ the issues remain relatively unpublicized. This may be due to the fact that fracking's impacts are inherently local, whereas sexual harassment, by contrast, would seem ubiquitous. But the MeToo movement not only cast light on how pervasive sexual misconduct is in the workplace,²⁵ it also drew attention to the legal, cultural, and psychological mechanisms that conspire to keep that pervasiveness hidden. Scholars who have analyzed the settlement of sexual harassment claims have articulated a number of negative repercussions arising from the widespread use of NDAs in these circumstances, including the shielding of illegal behavior and the externalizing of harm to third parties.²⁶ This chapter uses interview data to demonstrate that systematic inclusion of NDAs in fracking settlements similarly obscures public awareness of a threat to public health and safety, while also rendering the tort system unable to

²³ Megan S. Haines, *Hydraulic Fracturing and Related Activities as Giving Rise to Classic Tort Claims in Pennsylvania*, 87 PA. B.A. Q. 103 (2016).

²⁴ Lauren Pagel, "Hollywood comes to Washington to talk fracking," Earthworks (Feb. 18, 2011), available at: https://earthworks.org/blog/hollywood_comes_to_washington_to_talk_fracking/.

²⁵ This chapter focuses on sexual harassment in the workplace, and uses the terms "sexual harassment" and "sexual misconduct" interchangeably and with the intent of being comprehensive.

²⁶ See Carol M. Bast, *At What Price Silence: Are Confidentiality Agreements Enforceable?*, 25 WM. MITCHELL L. REV. 627, 700 (1999); David A. Hoffman & Eric Lampmann, *Hushing Contracts*, 2048 FACULTY SCHOLARSHIP AT PENN LAW 1, 41 (2019).

properly serve its goals of deterrence and compensation. It goes on to propose that NDAs in the fracking context should only be enforceable subject to a partial disclosure requirement that ensures that safety-related information related to the harm at issue is made available to the public, while keeping private the parties' identities.

These interviews were taken in July and August 2018, with individuals who live in Pennsylvania communities in which fracking activities have taken or are still taking place. The interviews were structured with the intent of gathering information about individuals' perceptions of the legal system as a means of compensating injuries allegedly caused by fracking. It was only towards the end of the interview collection process, and particularly during the transcript analysis, that parallels to the MeToo movement and sexual harassment claims began to emerge. Widespread use of NDAs to settle claims related to sexual harassment and fracking has managed to frustrate important legal principles in surprisingly similar ways. Although NDAs are commonly used as part of settlements in other areas of law, this chapter focuses on sexual harassment and fracking in particular because each of these issues is divisive and politicized, and those who make allegations might face retaliation or social ostracization for doing so. Such concerns are less prevalent in the products liability and medical malpractice contexts, for example. Furthermore, shedding light on how such similar consequences can arise in these two such dissimilar contexts illustrates a fundamental

problem with allowing contracts of silence to restrict the availability of information vital to public health and safety.

Part 2 of this chapter briefly summarizes how courts have treated sexual harassment claims pursuant to Title VII of the 1964 Civil Rights Act. It then provides an outline of the legal landscape governing fracking, before discussing the contract law principles that apply to the enforceability of nondisclosure agreements. In Part 3, the repercussions of using NDAs to suppress information regarding sexual misconduct allegations are juxtaposed with interview data discussing NDA use in the fracking context. Part 4 of the Article then analyzes solutions that have been proposed to address the negative repercussions of NDA use in the sexual harassment context, and provides recommendations for the fracking context based on this analysis. Finally, Part 5 concludes this chapter by considering how these recommendations might apply to NDAs in other contexts.

5.2 Relevant law and policy

5.2.1 Information as a regulatory tool

That citizens should be empowered to make informed decisions is a bedrock principle of democracy.²⁷ The right to receive information furthers several important interests.²⁸ For example, the Supreme Court recognized the public's right to commercial

²⁷ Elizabeth A. Aronson, *The First Amendment and Regulatory Responses to Workplace Sexual Misconduct: Clarifying the Treatment of Compelled Disclosure Regimes*, 93 N.Y.U. L. REV. 1201, 1204 (2018).

²⁸ Shannon M. Roesler, *The Nature of the Environmental Right to Know*, 39 ECOLOGY L.Q. 989, 1007 (2012).

information so as to help them make choices affecting their health and enjoyment of life.²⁹ Along similar lines, public policy favors protecting individuals against unknown risks, and ensuring that they have sufficient information to make risk-based decisions.³⁰ Assumption of the risk theories in tort law reflect this principle, recognizing that visitors to a landowner's property are unaware of any potentially hazardous conditions, and thus are not necessarily able to prepare for them.³¹ Similarly, when the public has limited access to relevant information, environmental hazards will tend to escape detection, risking harm to human health that might otherwise have been avoided.³²

Mandating the disclosure of information related to risks to human health or the environment thus furthers the individual liberty interests inherent in being able to make informed decisions about one's own wellbeing and risk tolerance.³³ But information disclosure laws have also begun to emerge as a favored regulatory tool in areas as diverse as corporate finances, nutrition labeling, and environmental law.³⁴ This increased transparency leaves the disclosing entities vulnerable to reputational damage for perceived negative behavior, thus incentivizing positive behavior without the inefficiencies inherent in command-and-control schemes. Allowing market forces and

²⁹ *Virginia State Pharmacy Board v. Virginia Citizens Consumer Council, Inc.*, 425 U.S. 748 (1976).

³⁰ Roesler, *supra* note 29, at 1009.

³¹ Keith N. Hylton, *Tort Duties of Landowners: A Positive Theory*, 44 WAKE FOREST L. REV. 1049, 1055 (2009).

³² Sarah Lamdan, *Beyond FOIA: Improving Access to Environmental Information in the United States*, 29 GEO. ENVTL. L. REV. 481, 483 (2017)

³³ See Roesler, *supra* note 29.

³⁴ Archon Fung, et al., *Full Disclosure* 75 (2007).

public opinion to complement or displace government regulation eases the burden on both the government and the regulated entities.³⁵ So although compelled speech is generally disfavored, mandatory disclosure of information related to public safety risks has been embraced when part of larger regulatory schemes.³⁶

5.2.2 Title VII and sexual harassment

Title VII of the Civil Rights Act of 1964 makes it unlawful for an employer to discriminate against any individual because of race, color, religion, sex, or national origin.³⁷ Because sexual harassment differs qualitatively from the kind of discrimination contemplated by Title VII, at least with respect to the other protected categories, it was not immediately clear whether it fell within the purview of the Act.³⁸ But in 1986, the Supreme Court held that “[w]ithout question, when a supervisor sexually harasses a subordinate because of the subordinate’s sex, that supervisor ‘discriminate[s]’ on the basis of sex.”³⁹ Relying on the language used in Title VII, the Court thus established the requirement that the harassment must have been “because of sex.”⁴⁰ The Court went on to state that for harassment to be actionable, it must be sufficiently severe and pervasive

³⁵ David W. Case, *Corporate Environmental Reporting as Informational Regulation: A Law and Economics Perspective*, 76 U. COLO. L. REV. 379, 382 (2005).

³⁶ See Aronson, *supra* note 28.

³⁷ 42 U.S.C. § 2000e-2(a)(1).

³⁸ Tippet, *supra* note 11, at 237.

³⁹ *Meritor Sav. Bank v. Vinson*, 477 U.S. 57, 64 (1986).

⁴⁰ *Id.*

to alter the conditions of the plaintiff's employment, creating a hostile or abusive work environment.⁴¹

In a subsequent ruling, the Court further clarified that to be actionable under Title VII, the harassment needs to be both objectively and subjectively severe.⁴² That is, it must be "an environment that a reasonable person would consider hostile or abusive," and the victim must have subjectively perceived it to be so.⁴³ The Court would revisit the "because of sex" requirement in *Oncale v. Sundowner Offshore Services, Inc.*,⁴⁴ holding that while the conduct need not be motivated by sexual desire, the victim does need to demonstrate that it amounts to discrimination because of sex.⁴⁵ The Court was clear in *Oncale*, however, that Title VII was not to be interpreted as a code for workplace civility.⁴⁶ Harassment between men and women does not automatically implicate Title VII, even if the words have sexual connotations.⁴⁷ There must be discrimination because of sex, as the text of Title VII makes plain.⁴⁸

Employer liability pursuant to Title VII varies, depending on whether the harasser is a supervisor or a co-worker.⁴⁹ "If the harassing employee is the victim's co-

⁴¹ *Id.* at 67.

⁴² *Harris v. Forklift Sys.*, 510 U.S. 17, 21–22 (1993).

⁴³ *Id.*

⁴⁴ 523 U.S. 75 (1998).

⁴⁵ *Id.* at 80-81.

⁴⁶ *Id.* at 80.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Vance v. Ball State Univ.*, 570 U.S. 421, 424 (2013).

worker, the employer is liable only if it was negligent in controlling working conditions.”⁵⁰ Negligence in this context can be established by showing that the employer failed to provide a means for filing complaints, failed to respond to those complaints, or discouraged employees from filing complaints.⁵¹ However, if the harassing employee is the victim’s supervisor, the employer is strictly liable if the harassment culminated in a tangible employment action.⁵² A tangible employment action includes things “such as discharge, demotion, or undesirable reassignment.”⁵³ In such instances, an employer is liable regardless of what steps it took or whether it had any notice of the misconduct. However, if no tangible employment action is taken, an employer is still presumed liable, but may avail itself of an affirmative defense “that (1) the employer exercised reasonable care to prevent and correct any harassing behavior and (2) that the plaintiff unreasonably failed to take advantage of the preventive or corrective opportunities that the employer provided.”⁵⁴

Scholars have criticized sexual harassment jurisprudence on a number of grounds, including the degree to which the Supreme Court standard for what

⁵⁰ *Id.*

⁵¹ *Id.* at 448-49.

⁵² *Id.* at 424.

⁵³ *Faragher v. City of Boca Raton*, 524 U.S. 775, 808 (1998).

⁵⁴ *Vance*, 570 U.S. at 424. See also *Burlington Indus., Inc. v. Ellerth*, 524 U.S. 765 (1998). It is also worth noting that empirical research into sexual harassment reporting suggested that the *Faragher* and *Burlington* opinions overestimate how straightforward a reasonableness analysis would be. Mindy E. Bergman, et al., *The (Un)reasonableness of Reporting: Antecedents and Consequences of Reporting Sexual Harassment*, 87 J. APPLIED PSYCHOLOGY 230, 237 (2002).

constitutes harassment is open to interpretation by lower courts.⁵⁵ Another concern is that the *Faragher* affirmative defense is functionally reactive, rather than preventative, and allows employers to be shielded from liability arising from an initial harassment complaint.⁵⁶ Similarly, as has come to light through the MeToo movement, a significant number of instances of harassment can be attributed to serial harassers.⁵⁷ Thus, courts likely need to reconsider what constitutes reasonable employer efforts to correct harassing behavior.⁵⁸ Furthermore, from a plaintiff's perspective, the second prong fails to account for the difficult circumstances that give rise to the myriad reasons some victims fail to make a claim promptly.⁵⁹

5.2.3 Fracking-related lawsuits

Plaintiffs have brought dozens of common law tort claims in response to injuries allegedly sustained as the result of fracking operations.⁶⁰ Most of the claims arise from the contamination of groundwater.⁶¹ Plaintiffs in these suits typically rely on private wells for drinking water, and allege that those wells became contaminated shortly after defendants' drilling operations began.⁶² Although many causes of action have been

⁵⁵ Tippet, *supra* note 11, at 239.

⁵⁶ *Id.* at 240.

⁵⁷ Hébert, *supra* note 8, at 332.

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ See Michael Goldman, *A Survey of Typical Claims and Key Defenses Asserted in Recent Hydraulic Fracturing Litigation*, 1 TEX. A&M L. REV. 305, 306 (2013).

⁶¹ *Id.* at 308.

⁶² *Id.*

alleged as part of water contamination suits, among the most common are private nuisance, trespass, and negligence.⁶³ Some plaintiffs have also brought strict liability claims, asserting that fracking constitutes an abnormally dangerous activity, one in which liability may attach even when a defendant has exercised the utmost care.⁶⁴ Although these common law tort claims have yielded predictably mixed results, the difficulty of proving causation has emerged as a common theme.⁶⁵ A number of factors have conspired to make causation difficult to prove in toxic tort cases, including difficulties identifying a specific harmful agent, identifying its source, determining exposure and dose, and doing so after a potentially long latency period.⁶⁶ In fracking tort cases, plaintiffs must also wrestle with the fact that some substances, such as methane, are naturally occurring in the water in areas near drilling, and reliable, adequate baseline testing is not always conducted prior to drilling.⁶⁷ This situation makes it difficult for plaintiffs to establish that the methane had not been present prior to drilling.⁶⁸

⁶³ *Id.* at 310.

⁶⁴ *See, e.g.,* Berish v. Southwestern Energy Production Co., 763 F.Supp.2d 702 (M.D. Pa. 2011).

⁶⁵ Monika Ehrman, *The Next Great Compromise: A Comprehensive Response to Opposition Against Shale Gas Development Using Hydraulic Fracturing in the United States*, 46 TEX. TECH L. REV. 423, 436 (2014).

⁶⁶ Kellie Fisher, *Communities in the Dark: The Use of State Sunshine Laws to Shed Light on the Fracking Industry*, 42 B.C. ENVTL. AFF. L. REV. 99, 113 (2015).

⁶⁷ *Id.* at 114.

⁶⁸ Chemists can distinguish, however, between the surface level methane that naturally appears in well water, and the methane from deep underground that is brought to the surface as part of the gas extraction process.

5.2.4 Use of nondisclosure agreements to settle claims

5.2.4.1 Torts and settlement

Generally speaking, damages in tort are awarded to serve two primary goals: (1) making the injured party whole by returning them to the state they were in prior to the tortious conduct; (2) and deterring that tortious conduct by penalizing it.⁶⁹ In theory, these goals should work hand in hand, and can be achieved through jury verdict or settlement. Public policy favors settlement as it tends to increase efficiency, reduce cost, and speed resolution.⁷⁰ This principle is woven into the Federal Rules of Civil Procedure, which encourage settlement at various points of litigation proceedings.⁷¹ In fact, there has been an increasing trend towards settlement, or perhaps any resolution other than a trial.⁷² Although there is some debate about the precise rate of settlement, research confirms that the majority of cases do settle, and tort actions have the highest rate of settlement.⁷³ Given the time, expense, and risk of trial, it is not surprising that parties prefer to resolve the matter before it reaches that point. Furthermore, settlements allow for more flexibility in their outcomes, increasing the chances that parties will

⁶⁹ Ross E. Cheit, *Tort Litigation, Transparency, and the Public Interest*, 13 ROGER WILLIAMS U. L. REV. 232 (2008).

⁷⁰ R. Kyle Alagood, *Settlement Confidentiality: A "Fracking" Disaster for Public Health and Safety*, 45 ENVTL. L. REP. NEWS & ANALYSIS 10459, 10463 (2015).

⁷¹ *Id.*; see also Laurie Dore, *Secrecy by Consent: The Use and Limits of Confidentiality in the Pursuit of Settlement*, 74 NOTRE DAME L. REV. 283, 288 (1999).

⁷² Dore, *supra* note 72, at 288.

⁷³ Theodore Eisenberg & Charlotte Lanvers, *What is the Settlement Rate and Why Should We Care?*, 6 J. EMPIRICAL LEGAL STUDIES 111 (2009).

resolve their disputes in a manner that is acceptable to each.⁷⁴ These negotiations often factor in interests that go beyond the issues being litigated, and are not necessarily limited to binary, zero sum outcomes.⁷⁵

5.2.4.2 Contracts and secrecy

A settlement is a legally enforceable contract between two private parties, and is therefore subject to the laws and public policy considerations that govern contracts. Freedom to contract is a foundational principle of American law, and it allows individuals to voluntarily enter into agreements with the understanding that the government will not sanction them for doing so, but will enforce the terms of those agreements.⁷⁶ Thus, courts will generally refrain from interfering, provided an agreement meets the requirements of a legally enforceable contract.⁷⁷ Nondisclosure agreements (“NDAs”), in which one party offers consideration in exchange for another party’s silence, are permissible exercises of the freedom to contract.⁷⁸ Settlement agreements often contain nondisclosure provisions that restrict parties from disclosing the terms, amount, or even existence of the settlement.⁷⁹ Courts are willing to enforce

⁷⁴ Carrie Menkel-Meadow, *Whose Dispute is it Anyway?: A Philosophical and Democratic Defense of Settlement (in Some Cases)*, 83 GEO. L.J. 2663, 2672-73 (1995).

⁷⁵ *Id.*

⁷⁶ Mark Pettit, Jr., *Freedom, Freedom to Contract, and the “Rise and Fall”*, 79 B.U. L. REV. 263, 287 (1999).

⁷⁷ Vasundhara Prasad, *If Anyone Is Listening, #MeToo: Breaking the Culture of Silence Around Sexual Abuse Through Regulating Non-Disclosure Agreements and Secret Settlements*, 59 B.C.L. REV. 2507, 2513 (2018).

⁷⁸ *Id.*

⁷⁹ Dore, *supra* note 72, at 386.

such provisions under the theory that one or both parties' interest in privacy will aid in resolving the dispute more quickly.⁸⁰ Furthermore, if plaintiffs can offer silence in settlement negotiations, they may end up with a better outcome.⁸¹ That bargaining chip can induce defendants to settle more quickly and for higher amounts to avoid reputational harm. Likewise, some scholars argue that allowing parties to settle their disputes privately is in the interests of justice: defendants should not have to abandon their privacy rights, and be forced to disclose damaging information, simply because they have been pulled into litigation.⁸² But this principle can apply to both parties, particularly in the context of sexual misconduct, where a plaintiff may desire privacy to avoid the stigma and negative publicity that can accompany that type of allegation.⁸³ Plaintiffs' desire for privacy in this context has been highlighted by recent litigation tactics employed by universities to force sexual assault claimants to abandon their anonymity in order for their lawsuits to proceed.⁸⁴

⁸⁰ Tippett, *supra* note 11, at 253

⁸¹ Richard A. Zitrin, *The Case Against Secret Settlements (Or, What You Don't Know Can Hurt You)*, 2 J. INST. FOR STUDY LEGAL ETHICS 115, 117 (1999).

⁸² *Id.* at 117-18

⁸³ Prasad, *supra* note 78, at 2516.

⁸⁴ Anemona Hartocollis, *Colleges Challenge a Common Protection in Sexual Assault Lawsuits: Anonymity*, N.Y. Times (May 29, 2019), *available at*: <https://www.nytimes.com/2019/05/29/us/college-sexual-assault-anonymous.html?login=email&auth=login-email>.

5.2.4.3 Nondisclosure agreements to settle fracking and sexual harassment claims

Tort suits arising from injuries allegedly caused by oil and gas activities are usually settled outside of court, and those settlements almost exclusively contain an NDA.⁸⁵ In fact, the general understanding is that oil and gas companies will refuse to settle without plaintiffs signing extensive NDAs that not only prohibit discussion of the settlement terms, but also discussion of fracking in general.⁸⁶ NDAs may also be a condition of any kind of financial compensation paid to landowners complaining directly to gas companies, even if a suit is never filed.⁸⁷ These NDAs usually bar the plaintiff from discussing either the terms of the settlement or the conditions or complaint that led to it.⁸⁸ In the case cited in the Introduction, as part of the out of court settlement for injuries allegedly resulting from noxious air emissions and water contamination, the Hallowich family agreed “to a joint statement of confidentiality, whereby they will not make any statements or comments, directly or indirectly, to any third party regarding the well operators, oil and gas development, fracking, their experience with any of the well operators or oil and gas companies, natural gas drilling or other operations, or Marcellus Shale activity.”⁸⁹ Of course, the inability to discuss the

⁸⁵ Tyler White, *A “Minor” Problem with Oil and Gas Company Settlement Agreements*, 5 LSU J. OF ENERGY L. & RESOURCES 212 (2017).

⁸⁶ Fisher, *supra* note 67, at 119.

⁸⁷ *Id.* at 116.

⁸⁸ *Id.* at 118.

⁸⁹ *Id.* at 118.

terms of the settlements makes it difficult to determine whether such an expansive NDA is typical or an aberration.

Similarly, many settlements resolving sexual harassment claims also contain NDAs,⁹⁰ which can serve both to protect the reputation of the company, but also that of the harasser.⁹¹ Widespread use of NDAs prevents women who have been harassed from coming forward, thus allowing perpetrators to continue engaging in sexual harassment.⁹² But NDAs not only make it difficult to identify the pervasiveness of harassment by a particular individual or at a particular company, they also cloud the extent of harassment across the board. That is, NDAs serve to depress the statistics on sexual harassment, making it more difficult to galvanize support for policy changes.⁹³ For those individuals who avail themselves of the legal system to respond to sexual harassment, the systematic use of NDAs diminishes their ability to recover in court. Proving claims in court has shown to be very difficult in sexual misconduct cases. For a woman to successfully do so, being able to identify other women who have had similar experiences can be crucial.⁹⁴ Without such corroboration, a victim may face a he-said-she-said situation in which she is unlikely to prevail.⁹⁵

⁹⁰ Margaret Ryznar, *#MeToo & Tax*, 75 WASH. & LEE L. REV. ONLINE 53, 54 (2018).

⁹¹ Sexual harassment law after metoo 134

⁹² Mizrahi, *supra* note 14, at 333.

⁹³ Ryznar, *supra* note 91, at 55.

⁹⁴ Tippett, *supra* note 11, at 134.

⁹⁵ *Id.*

5.2.4.4 Enforceability of nondisclosure agreements

The potentially harmful repercussions of using NDAs to restrict information dissemination have raised questions about their enforceability. Because NDAs are contract provisions, their enforcement is subject to the same public policy exception as any other contract provision. Although courts may be loath to interfere with private parties' freedom to contract and its accompanying expectations, they have recognized public policy exceptions that can render some contracts or their provisions unenforceable.⁹⁶ Section 178 of the Second Restatement of Contracts states that term of a contract is unenforceable on policy grounds if "the interest in its enforcement is clearly outweighed in the circumstances by a public policy against the enforcement of such terms."⁹⁷ The Restatement thus establishes a balancing test in which courts are to weigh (1) the preservation of the parties' justified expectations, (2) forfeiture that would result, and (3) any special public interest in enforcing the term against (1) the strength of the policy pursuant to legislation and judicial decisions, (2) the likelihood that non-enforcement will further that policy, (3) the seriousness and deliberateness of any misconduct involved, and (4) the connection between the misconduct and the term in question.⁹⁸ Section 179 of the Restatement further clarifies that public policy may be

⁹⁶ See *McCracken v. Progressive Direct Ins. Co.*, 896 F.3d 1166, 1172 (10th Cir. 2018).

⁹⁷ Restatement (Second) of Contracts § 178 (1981).

⁹⁸ *Id.*

derived from legislation or the need to protect the public welfare.⁹⁹ Thus, the determination hinges not on the benefit to the party seeking the determination, but rather based on whether enforcement of the provision would be detrimental to the public welfare.¹⁰⁰

But courts must proceed cautiously, and exercise this power to void contract provisions only in cases that are clear and free from doubt.¹⁰¹ That is, the public policy at issue must clearly outweigh the general policy interests in favor of enforcing contract terms.¹⁰² Few situations are as clear as when a statute specifies that a provision or contract is to be void under certain circumstances.¹⁰³ Florida's Sunshine in Litigation Act, for example, voids as a matter of policy any agreement that conceals a public hazard.¹⁰⁴ Arkansas has a similar rule, which states that "[a]ny provision of a contract or agreement entered into to settle a lawsuit which purports to restrict any person's right to disclose the existence or harmfulness of an environmental hazard is declared to be against the public policy of the State of Arkansas and therefore void."¹⁰⁵ These statutes plainly establish public policy exceptions to the freedom to contract.

⁹⁹ Restatement (Second) of Contracts § 179 (1981).

¹⁰⁰ *McCracken*, 896 F.3d at 1172.

¹⁰¹ *Combs v. Shelter Mut. Ins. Co.*, 551 F.3d 991, 996 (10th Cir. 2008).

¹⁰² *McCracken*, 896 F.3d at 1172.

¹⁰³ Alan E. Garfield, *Promises of Silence: Contract Law and Freedom of Speech*, 83 CORNELL L. REV. 261, 296 (1998).

¹⁰⁴ FLA. STAT. ANN. § 69.081(4).

¹⁰⁵ ARK. CODE ANN. § 16-55-122(a).

This kind of clear legislative mandate is rare, however, and courts can look to the Restatement balancing test as a guide for what may qualify as a public policy exception to enforceability.¹⁰⁶ This balancing test leaves some room for interpretation, and will vary somewhat based on each state's contract law and public policy concerns. "Public policy is a term not easily defined. Its significance varies as the habits and needs of a people may vary. It is not static and the field of application is an ever increasing one. A contract, or a particular provision therein, valid in one era may be wholly opposed to the public policy of another."¹⁰⁷ Although one court may interpret this inherent variability as inviting judges to bring to bear their own interpretation of what constitutes relevant public policy, another may see it as reason to exercise restraint under such circumstances.¹⁰⁸

Despite this potential divergence of opinion, there have been certain categories of public policy concerns that have prompted courts to exercise their power to invalidate a contract provision on the basis of public policy. For example, courts have been increasingly willing to scrutinize NDAs, the enforcement of which could put public health and safety at risk. For example, a Connecticut court identified the importance of patients' interests in hospitals having access to full information when hiring nurses or

¹⁰⁶ Garfield, *supra* note 104, at 296.

¹⁰⁷ Henningsen v. Bloomfield Motors, Inc., 161 A.2d 69, 94-95 (N.J. 1960).

¹⁰⁸ See Maryland-Nat'l Capital Park and Planning Comm'n v. Washington Nat'l Arena, 386 A.2d 1216 (Md. 1978).

other medical personnel.¹⁰⁹ Similarly, an Ohio court of appeals determined that “an employment separation agreement clause purporting to prohibit a school district from disclosing pedophilia on the part of a teacher to a school district that subsequently employs him is void as against public policy.”¹¹⁰ Finally, in the products liability arena, courts have tended to permit employees to testify against their employers, despite being subject to NDAs.¹¹¹ Products liability settlements have often been sealed or subject to protective orders which, predictably, masks the extent of problems with a given product.¹¹²

Some scholars have argued that NDAs preventing the disclosure environmental risks to public health and safety should be void as against public policy.¹¹³ The reasoning is similar to that in other types of litigation: while an NDA might be in the best interests of the litigating parties, it does not take into account other members of the public whose ignorance of the environmental hazard at issue may ultimately lead to additional injuries.¹¹⁴ However, some have pointed out that the other branches of the government are tasked with protecting the public from environmental hazards, and

¹⁰⁹ *Giannecchini v. Hospital of St. Raphael*, 780 A.2d 1006 (Conn. Super. 2000). Although the court ultimately did not to void the NDAs in question, that holding was in deference to state statutes that spoke to the issue.

¹¹⁰ *Bowman v. Parma Board of Educ.*, 542 N.E.2d 663, 666 (Ohio Ct. App. 1988).

¹¹¹ Jodi L. Short, *Killing the Messenger: The Use of Nondisclosure Agreements to Silence Whistleblowers*, 60 U. PITT. L. REV. 1207, 1215 (1999).

¹¹² David Luban, *Settlements and the Erosion of the Public Realm*, 83 GEO. L.J. 2619, 2650 (1995).

¹¹³ See Alagood, *supra* note 71.

¹¹⁴ See Dore, *supra* note 72, at 369.

therefore, courts should not set about doing so by upending contractual expectations.¹¹⁵ But that argument fails to consider that agencies and legislatures need accurate information in order to craft laws and regulations, and allowing private parties to stifle the flow of information via contract thus subverts public policy.¹¹⁶ In fact, in order to fulfill its stated mission of protecting human health and the environment, EPA works to ensure that “[a]ll parts of society -- communities, individuals, businesses, and state, local and tribal governments -- have access to accurate information sufficient to effectively participate in managing human health and environmental risks.”¹¹⁷ Along similar lines, Congress, through enactment of numerous environmental laws, has demonstrated that protecting public health and safety from environmental risks is its responsibility, and NDAs that interfere with that responsibility should be scrutinized as potentially being unenforceable as against public policy.¹¹⁸

With regard to Pennsylvania law, the Third Circuit held that a court should not automatically seal settlements merely because the parties so request it.¹¹⁹ Instead, a court should only do so if the parties demonstrate good cause, by establishing with specificity a clearly defined injury that failure to seal will inflict on one or both parties.¹²⁰

¹¹⁵ *Id.*

¹¹⁶ Alagood, *supra* note 71, at 10465.

¹¹⁷ U.S. Env'tl. Protection Agency, Our Mission and What We Do, *available at*: <https://www.epa.gov/aboutepa/our-mission-and-what-we-do>.

¹¹⁸ Amie Sloane, *Secret Settlements and Protecting Public Health and Safety: How Can We Disclose with Our Mouths Shut?*, 3 APPALACHIAN J.L. 61, 70 (2004).

¹¹⁹ *Pansy v. Borough of Stroudsburg*, 23 F.3d 772, 786 (3d. Cir. 1994).

¹²⁰ *Id.*

Although the court was deciding whether to seal a settlement agreement, rather than enforce the terms of a private settlement, it did acknowledge in a footnote that provisions of silence in private agreements may be unenforceable if they violate public policy.¹²¹ Nevertheless, the Third Circuit recently appeared to take a more cautious approach when considering the exception to contract enforcement: “[p]ublic policy is ... ascertained by reference to the laws and legal precedents and not from general considerations of supposed public interest.”¹²² This interpretation seems more in line with the traditional view of the public policy exception, namely that such a policy should be derived from statute or case law. However, Article I, Section 27 of the Pennsylvania Constitution states that “[t]he people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment.” The Supreme Court of Pennsylvania explained that “[t]his clause places a limitation on the state’s power to act contrary to this right, and while the subject of this right may be amenable to regulation, any laws that unreasonably impair the right are unconstitutional.”¹²³ That the rights to clean air and water are enshrined in Pennsylvania’s constitution suggests that there is an argument for courts voiding

¹²¹ *Id.* at 788 n.21.

¹²² *Lupu v. Loan City, LLC*, 903 F.3d 382, 393-94 (3d Cir. 2018) (*citing* *Hall v. Amica Mut. Ins. Co.*, 538 Pa. 337, 648 A.2d 755, 760 (1994) (*quoting* *Muschany v. United States*, 324 U.S. 49, 66-67, 65 S.Ct. 442, 89 L.Ed. 744 (1945))).

¹²³ *Pennsylvania Evtl. Def. Found. v. Commonwealth*, 161 A.3d 911, 931 (Pa. 2017).

contract provisions that, were they to be enforced, pose a threat to these constitutional rights.

Scholars have also argued that enforcement of NDAs that restrict the flow of information about sexual misconduct should be void as against public policy.¹²⁴ The reasoning is similar to that in the environmental context: NDAs allow additional parties to be injured, investigations are undermined by the reduced availability of witnesses, and policymakers have diminished ability to develop policies to protect the public. Although enforceability of NDAs in the sexual harassment context has not been extensively litigated,¹²⁵ several states, including California, New York, and Pennsylvania, have considered or passed legislation to address the issue.¹²⁶ In fact, California has largely rendered unenforceable most NDAs related to sexual harassment claims filed in court or in an administrative proceeding.¹²⁷

5.3 Convergence of sexual harassment and fracking claims

Some scholars have conceptualized the use of NDAs as a situation in which the parties enter into bargains that internalize the benefits and externalize the costs.¹²⁸ That is, one party ends up with money, the other with reputation-saving silence, but third parties remain at risk for the harm that gave rise to the settlement in the first place. In

¹²⁴ *E.g.*, Prasad, *supra* note 78, at 2509.

¹²⁵ Garfield, *supra* note 104, at 263.

¹²⁶ Tippet, *supra* note 11, at 255.

¹²⁷ Hoffman & Lampmann, *supra* note 27, at 29.

¹²⁸ *Id.* at 41.

both the sexual harassment and fracking contexts, information about harm is suppressed by a variety of legal, cultural, and psychological mechanisms. Without this information being made available, it is difficult, if not impossible, to identify and punish repeat offenders, leaving them free to continue harming others. Furthermore, unless policymakers are aware of the extent and severity of these issues, they cannot enact the kind of policies that would better deter bad behavior or compensate those who have been harmed. As the following discussion demonstrates, the negative repercussions that arise from limiting public access to risk information, particularly through the systematic use of NDAs, are not merely theoretical, but very real.

Another means of ensuring that information about sexual harassment claims does not become public, alongside NDAs, is the use of mandatory arbitration clauses.¹²⁹ Since 2000, organizations have increasingly conditioned employment on employees signing forced arbitration clauses, which forces sexual harassment victims to take their claims to arbitration, rather than allowing them to litigate them.¹³⁰ Use of this kind of private forum diminishes claimants' abilities to identify witnesses who might lend credibility to their claims, thus tilting the outcome in favor of the employer.¹³¹ Thus, claimants not only struggle to prevail on their claims, but the proceedings do not become part of the public record, which shields harassers from more significant

¹²⁹ Prasad, *supra* note 78, at 2508 n.5.

¹³⁰ Alexander J. S. Colvin, *The Growing Use of Mandatory Arbitration*, Econ. Pol'y Inst. (2017).

¹³¹ Mizrahi, *supra* note 14, at 135.

consequences.¹³² The use of forced arbitration clauses also appeared in leases that landowners signed when negotiating with gas companies. “[W]ell, that’s one of the things that the early contracts had that any dispute had to be arbitrated. So you could not sue.” (1101) Use of arbitration agreements in this context serves the same purposes of maintaining secrecy and stacking the deck in favor of the gas company.

5.3.1 Economic discrepancies between parties

Research suggests that victims of sexual harassment are disproportionately the most economically vulnerable employees.¹³³ Put another way, people who cannot afford to lose their jobs or face retaliation are less likely to speak up, and are, therefore, more likely to be subject to prolonged harassment.¹³⁴ Similarly, those who have alleged water contamination issues arising from fracking activities are often disproportionately economically disadvantaged individuals living in rural areas.¹³⁵ Although topography and the location of extractable gas certainly play a role, those with less income have stronger economic incentives to lease their land, and are less able to effectively mobilize opposition to fracking in their community, should they be concerned about its risks.¹³⁶ Therefore the burdens of fracking are disproportionately borne by the rural poor, despite the fact that not everyone in a community benefits directly from these activities.

¹³² *Id.*

¹³³ *Id.* at 139-40.

¹³⁴ *Id.*

¹³⁵ Emeka Duruigbo, *Fracking and the NIMBY Syndrome*, 26 N.Y.U. ENVTL. L.J. 227, 250 (2018).

¹³⁶ *Id.*

Many people in these communities do feel as though they are treated differently due to their social economic status. “And that clearly meant they did not care about public opinion in this area. We are not real people, we are Appalachians, we are boneheads or whatever, we are backwoods -- which is ironic because even though Pittsburgh with CMU and all these high-class institutions, anywhere outside here, we’re just part of that northern Appalachian culture. I mean it seems like that’s the assumption. That’s what I’m feeling.” (1014)

Because many of the people who can afford to pay for silence are wealthy, powerful individuals who can likewise afford prolonged litigation,¹³⁷ many sexual harassment victims feel as though their only recourse is to accept a settlement that includes an NDA.¹³⁸ Residents in rural Pennsylvania are similarly well aware of the dilemma created by the power asymmetry between the gas companies and the landowners. “Well, this is hardscrabble stuff -- these are people who couldn’t afford to retain a lawyer to help an individual or even a group. And so they feel like they’re stuck. They don’t have the resources to stand up against the drillers, and the drillers say the only chance you’ve got to get anything from us is to sign this non-disclosure agreement.” (1701) One farmer, who brought suit against a gas company after animals

¹³⁷ Mimi A. Akel, *The Good, the Bad, and the Evils of the #MeToo Movement’s Sexual Harassment Allegations in Today’s Society: A Cautionary Tale Regarding the Cost of These Claims to the Victims, the Accused, and Beyond*, 49 CAL. W. INT’L L.J. 103, 111 (2018).

¹³⁸ Prasad, *supra* note 78, at 2539.

on her farm began dying shortly after drilling commenced both on and adjacent to her property, lamented that it took years before her neighbors admitted to losing livestock at the same time she did. When asked why they took so long to say anything, she replied that the mentality of many farmers was simply to accept the losses and refuse to discuss it. She speculated that they did not want to risk the consequences of complaining “[b]ecause of the gas company. You can’t fight the gas company, it’s like fighting the phone company. I mean, seriously.” (1104) Awareness of the power asymmetry discourages many of those who believe they have been harmed from considering litigation to be a realistic option. As a result, they are often willing to accept unsatisfying settlements, provided they even decide it is worth bringing a claim in the first place.

5.3.2 Privacy concerns

As noted above, one of the arguments in favor of allowing settling parties to contract for secrecy is that, in certain contexts, both parties value privacy.¹³⁹ In the sexual harassment context, the accused have a clear motivation to avoid having their reputations damaged by the allegations, but accusers often prefer to have potentially embarrassing and traumatic details of their treatment kept private, as well.¹⁴⁰ They may also wish to avoid the stigma that can come with being victimized, as well as the fear

¹³⁹ *Id.* at 2516.

¹⁴⁰ *Id.*

that future employers might view them as litigious.¹⁴¹ Although people who allege water contamination issues might have less powerful incentives for wishing to keep settlements secret, the divisiveness of the fracking issue does motivate some people to prefer to keep these issues to themselves. For many who live in these rural communities, fracking has brought them much needed income, and they respond very negatively to those who complain about it or bring lawsuits. “The whole thing with people who lease, it’s like they’re not the enemy to me. I mean, I’m the enemy to them, I understand that. ... [T]hey don’t want me messing with their source of income. I understand that, you know, it’s like if they had experienced the health impacts --” (1437A) Even those who, out of concern for their neighbors’ safety, alert them of problematic water test results, run the risk of being ostracized. “[W]hen we were told by the health department, ‘look, you’ve got arsenic in your water, you really need to contact your neighbors around you and tell them you have arsenic in your water maybe they’ll get there water tested too.’ Okay. I called the neighbors. Guess what. I would have been better off to have leprosy. Because from then on, it was like none of them wanted to talk to you. Didn’t want to hear it. Don’t talk about your water.” (1104) Given how contentious the fracking issue has become in these communities, being able to settle without any publicity might be preferable for many residents.

¹⁴¹ *Id.*

But even to the extent that some plaintiffs might benefit from being able to keep details about the settlement, or even its very existence, from being publicized, NDAs usually bestow disproportionate benefits on the more powerful party by allowing them to limit their liability for misconduct.¹⁴² Plaintiffs in these situations are giving up the right to speak about their experiences, while defendant companies are saving themselves any economic damage that might flow from subsequent harm to their reputations. Prior to the #MeToo movement, companies considered settlement of harassment claims to be just another cost of doing business,¹⁴³ and it was worth paying out more money in a settlement in exchange for an NDA if they viewed the employee accused of sexual harassment to be sufficiently valuable.¹⁴⁴ But doing so weakens any internal disciplinary measures because an economically valuable executive might opt to leave for a competitor, rather than endure any kind of discipline.¹⁴⁵ Thus, knowing that the company would not want to risk the publicity that would come with disclosing the behavior to that competitor, a sufficiently powerful harasser might escape any serious repercussions. However, as the #MeToo movement has brought so much publicity to the problem of sexual harassment in the workplace, companies have been forced to consider whether the public relations backlash from keeping a known perpetrator on

¹⁴² Ryznar, *supra* note 91, at 56.

¹⁴³ Tippet, *supra* note 11, at 272.

¹⁴⁴ Hébert, *supra* note 9, at 324.

¹⁴⁵ Tippet, *supra* note 11, at 279.

staff is worth whatever economic value he might add.¹⁴⁶ In the fracking context, many residents feel as though the gas companies are making a similar calculation as was seen in the sexual harassment context prior to #MeToo. That is, they feel as though gas companies are using NDAs to avoid the negative publicity that would come with litigation, and to keep the extent of the water contamination issues from being discovered. “[T]hey want to be portrayed as a good neighbor. They don’t want their crap being out on ‘60 Minutes’ every hour, or the news station: ‘oh, this company poisoned this residence down here.’ They don’t want that.” (1104) But just as companies might see NDAs as a means of limiting negative publicity should a landowner’s water be contaminated, the media backlash generated by their application to minor children in the Hallowich case surely serves as a cautionary tale.¹⁴⁷

5.3.3 Enabling future harm

Regardless of whether one views NDAs as something nefarious or simply pragmatic, their systematic inclusion in settlements arising from sexual harassment and fracking claims inevitably restricts the flow of important information, giving rise to some of the policy concerns Section 178 of the Restatement contemplates. “It’s a way of controlling the information that could get out about harm and so you know, how do you find out about nondisclosure agreements? How do you, unless somebody is gonna in

¹⁴⁶ Hébert, *supra* note 9, at 324-25.

¹⁴⁷ See Hopey, *supra* note 16.

confidence say, 'here's what I had to sign'? But they have legal repercussions if they violate that. That's a pretty good system, isn't it?" (1005) One of the clear drawbacks of the use of NDAs in sexual harassment settlements is that by preventing accusers from speaking out about the alleged conduct, it is difficult to establish patterns, and thus perpetrators are able to continue engaging in this behavior with minimal external consequences.¹⁴⁸ NDAs thus function as a shield that protects perpetrators from the kinds of investigations that might reveal repeated misconduct.¹⁴⁹ Many landowners living near fracking operations voiced similar concerns about the potential for more injured parties. "I feel like it's wrong -- it gives gas companies an out. It shuts people up, and then they can just keep doing what they're doing. And the story never gets out. So more people are going to be harmed because of the people who have been harmed not being able to tell their story. So I don't even think they should be allowed to get away with that." (1014) NDAs prevent external accountability, allowing similarly injurious behavior to continue.

Not surprisingly, the potential for additional parties to be harmed is perhaps the primary criticism of the systematic use of NDAs in these types of settlements.¹⁵⁰ Even in a situation in which both parties sincerely value the privacy afforded by including a nondisclosure provision in the settlement agreement, those privacy interests do not take

¹⁴⁸ Ryznar, *supra* note 91, at 54-55.

¹⁴⁹ Ian Ayres, *Targeting Repeat Offender NDAs*, 71 STAN. L. REV. ONLINE 76, 77 (2018).

¹⁵⁰ *See id.*

into account the potential impact on third parties. That is, while public policy does favor the freedom to contract, there is a countervailing policy argument against contracts of silence that suppress information about threats to public health and safety.¹⁵¹ So, for example, the parties to a sexual harassment settlement might benefit from agreeing to remain silent, but that silence does not take into account the interests of any potential future victims who might then be at risk of being similarly victimized. But while many victims of sexual harassment have very compelling reasons for preferring to avoid publicity, others wish to speak about their experiences for the benefit of others.¹⁵² The same can be said of those harmed by fracking operations. “Do you think, I mean seriously, do you think that company has enough money for me to keep my mouth shut? It will not happen. If I could prove them wrong, ... our attorney was talking about nondisclosure agreement, keep your mouth shut. But I was like, ‘you better start adding friggin’ zeros and we’ll talk about it, but until then no.’ Why should other people suffer?” (1104) While the victims of sexual harassment might be cognizant that an NDA could enable a perpetrator to harm other employees, the offending conduct can feel intensely personal. As a result, they might not necessarily assume that the perpetrator inevitably poses a risk of future harm to others. In the fracking context, on the other hand, contaminated water is not personal, nor is it subject to social or

¹⁵¹ Bast, *supra* note 27, at 700.

¹⁵² See Taishi Duchicela, *Rethinking Nondisclosure Agreements in Sexual Misconduct Cases*, 20 LOY. J. PUB. INT. L. 53 (2018).

behavioral constraints. Thus, it is easier for a landowner to assume that the substances that contaminated her well also pose a direct threat to others nearby. “So the next people, they’re signing a lease and they don’t know that maybe the guy next to them or two blocks away got sick, and can’t tell them because they’re under non-disclosure -- so you don’t get the benefit of what your neighbors experienced. So, basically, I think the system’s very bad to allow that.” (1014)

5.3.4 Discouraging claims

In addition to enabling future harm to third parties, using NDAs to reduce information availability can ultimately discourage injured parties from engaging with the legal system to seek redress. Awareness that others have suffered similar sexual harassment encourages victims to take steps to address it.¹⁵³ Sexual harassment is a circumstance that lends itself to a first-mover disadvantage, in that the first accuser faces a “he said, she said” credibility contest that can be stacked in favor of the accused.¹⁵⁴ A first line of defense against an accusation of sexual harassment is to dismiss the accuser as vindictive or crazy, and then ignore the accusation entirely.¹⁵⁵ Such a response halts the proceeding, and can even cause a victim to have doubts about whether the misconduct she suffered was, in fact, harassment.¹⁵⁶ An expectation of being dismissed

¹⁵³ Ian Ayers & Cait Unkovic, *Information Escrows*, 111 MICH. L. REV. 145, 160-61 (2012).

¹⁵⁴ *Id.*

¹⁵⁵ Hébert, *supra* note 9, at 329.

¹⁵⁶ Ayers & Unkovic, *supra* note 152, at 61.

and demonized discourages victims from coming forth unless they know there will be other victims to corroborate their claim.¹⁵⁷ Thus, because NDAs prevent victims from being aware of the experiences of others, they are less likely to avail themselves of the institutions that have been put in place to address this type of misconduct.

Several interviewees reported having their concerns bluntly dismissed when they called gas companies about the problems the fracking operations were causing, and more than one spoke of combative representatives answering helpline calls. They suspected that this behavior was a calculated first hurdle intended to discourage residents from continuing to seek assistance. Being dismissed in this way can and does undermine a person's confidence in her own experiences. One resident, who had dealt with a litany of issues arising from a wellpad on an adjacent property, sincerely asked at the conclusion of her interview whether she was the only one experiencing the types of problems she had described. Not knowing that others are experiencing similar issues discourages injured parties from engaging with the legal system to seek remedies, in part because they cannot learn from others' experiences. Some residents openly acknowledged that they did not know what steps they could take if they suspected that their water had been contaminated, and one complained that NDAs kept people from realizing that they might consider consulting an attorney and filing suit. She went on to

¹⁵⁷ *Id.* at 160-61; Hébert, *supra* note 9, at 329; Akel, *supra* note 138, at 113.

say that “the fact that there’s settlement means they’re admitting to something but they’re not taking responsibility totally. And then it discourages others from suing or doing whatever they need to do.” (5_1143)

5.3.5 Reducing public awareness of the issue’s pervasiveness

Another consequence of the widespread use of NDAs is that they impact statistics in a way that makes these issues seem less pervasive than they really are.¹⁵⁸ Without accurate reporting on the frequency of a particular occurrence, policymakers are less likely to understand its severity, and the need to take steps to address it. One outcome of the #MeToo movement was to shed light, not only on the pervasiveness and severity of sexual harassment, but also on the failure of the state to protect its citizens. The subsequent legislative response, in which several states proposed bills to curtail the negative repercussions of NDAs,¹⁵⁹ demonstrates that politicians will respond to pressure from constituents. But enough constituents need to be aware of a problem in order to demand governmental action. Even then, some remain skeptical about government action, regardless of context. “The only good thing about having city water, I think, is if a lot of people’s water is affected, then you might be able to get more action than if just a single well was affected. However, I don’t know if the people in Flint would agree.” (1003-A)

¹⁵⁸ Ryznar, *supra* note 91, at 55.

¹⁵⁹ *Id.* at 56; Tippett, *supra* note 11, at 255.

With NDAs contributing to artificially lowered sexual harassment statistics, at least a certain portion of the population was unaware of the ubiquity of the problem. However, once stories of harassment began to spread on social media, ignorance of the issue could no longer justify a failure to address it. NDAs have, in all likelihood, similarly depressed statistics on water contamination issues that have arisen from fracking. Without information on claims and settlements, industry supporters continue to claim that there have been no proven incidents of fracking causing water contamination.¹⁶⁰ Yet several interviewees made reference to gas company employees casually referencing their culpability in contaminating water wells. One interviewee had reached out to a gas company representative about her water concerns after drilling began, “and the guy said, ‘oh you know what, I’ve only ever known five water wells going bad because of us.’ Like, that’s enough. That’s enough. I mean that’s enough. He’s like, ‘oh you’ll be fine.’” (1233)

Not surprisingly, some residents in Pennsylvania feel as though the use of NDAs is part of a larger, aggressive effort to minimize public awareness of the harms of fracking.

No, no, they’re not really going to court, they’re being paid off and then forced to sign non-disclosure agreements. The gas industry knows full well that they’re contaminating these wells, and when they do, people

¹⁶⁰ See Susan Owen, “Rick Perry says there’s no proven instance of groundwater polluted by fracking”, Politifact, available at: <https://www.politifact.com/texas/statements/2012/feb/29/rick-perry/rick-perry-says-theres-no-proven-instance-groundwa/>

come to them and they say “here, we’ll mitigate the issue, we’ll give you a bunch of money, but you can’t talk about it now. Because if you do, we’re gonna sue the hell out of you. We have millions of dollars’ worth of lawyers that we will stick on you, and it’ll be awful.” They’re threatening, they’re violent, they’re vicious, it’s nasty. (1519)

This reaction is common among interviewees who have either made a complaint to a gas company, or know others who have. “I think it’s just a cover-up. I don’t think it should be allowed, I feel like there’s probably so much we don’t know and they’re shutting people up.” (1233) But even to the extent that gas companies include NDAs only in an attempt to stave off a flood of spurious claims by opportunistic landowners, rumors that companies are paying for silence will inevitably arouse suspicion and concern. “Yeah, I’ve often wondered how many people in Butler County have litigated. I often wondered that when I’m driving through the countryside, like okay how many of these people have had their wells contaminated, and no one is ever gonna know?” (1437-A)

5.3.6 Controlling narratives

Without reliable information on the frequency or severity of harm, the more powerful party can seize control of the narrative in a way that maintains the status quo. In the sexual harassment context, incidents that come to light involving repeat offenders can still be characterized as one-off issues if the other victims are contractually bound to silence. Likewise, the difficulty victims have in recovering in court can be touted as evidence that the claims were spurious. Statistics that significantly underreport the frequency of harassment incidents can be wielded as evidence that the problem is

insignificant or under control. Finally, individual accusers can be dismissed as crazy, vindictive, or overly sensitive, as they have no one to corroborate their claims.¹⁶¹ Each of these narratives either undermines an accuser's credibility, or suggests that these incidents are few and far between, which allows a harasser or the company for which he works to retain a (relatively) unblemished reputation. The MeToo movement exposed the perfidiousness of this narrative, galvanizing both the public and policymakers as a result.¹⁶²

Narratives play a similarly important role in shaping the fracking debate, some of which bear strong resemblance to those used in the sexual misconduct context. For example, some residents in Pennsylvania feel as though NDAs are deliberately used to minimize the publicity surrounding water contamination issues, which in turn preserves the gas companies' ability to dismiss these issues as exceptions to otherwise sterling records of safety. "Well that way nothing can get out of the bag that the industry does or continues to do to people. And if people aren't allowed to talk about it then everyone thinks that everything is fine. Or what's worse yet is if you know people who have gag orders, people say 'oh well that's just one person,' or 'that's just a handful of people who have gag orders.'" (1556) Conveniently, NDAs ensure that no one knows how many NDAs are in effect, nor the extent to which that impacts residents' views on the issue.

¹⁶¹ Hébert, *supra* note 9, at 329.

¹⁶² *See id.*

Several interviewees did, in fact, believe that the gas industry had a good record of safety, and was only responsible for a few water contamination incidents. “Now there could be one off the wall thing where something happened and you could complain about it, but there’s always 1, 2, 3% of somebody that’s never gonna be happy no matter what.” (1321) It goes without saying that the absence of information leaves individuals to draw their own conclusions, which some would argue is the point of NDAs in this context.

Furthermore, pro-fracking interviewees consistently characterized complaints about degraded water quality as cynical attempts by landowners to exploit the deep pockets of the gas companies. “Yeah, the methane’s been there the whole time. They just – now they can blame it on somebody. Now they can say ‘hey, it’s your fault.’ No, you could always light that water on fire. You could always do it – it wasn’t because of them.” (1321) “But here comes these big oil and gas companies, and they’ve got cash. And a lot of people are thinking this is a cash cow, and I’m gonna get some of it. And they fabricate stories.” (1212) Similar accusations arise in the sexual harassment context, as well, with victims’ attempts at seeking justice being dismissively characterized as cynical schemes to make money.¹⁶³

¹⁶³ Devora Meyers, “President of Gymnastics’ Athletes’ Commission Says Abuse Survivors Are In It For The Money”, *Deadspin*, available at: <https://deadspin.com/president-of-gymnastics-athletes-commission-says-abuse-1832990508>.

Another opinion that pro-fracking, anti-regulation interviewees all had in common was that no matter the activity, there will always be people who find something wrong with it. “So you’re always gonna have somebody that they could repave the road and one guy would say ‘well, there’s bumps there’ or something. You know – you know what I mean? You’re always gonna have somebody that’s not gonna agree with it, but if it enriches 95% of the people instead of 5% of the people, wouldn’t that be better?” (1321) “Everybody – anybody that doesn’t understand the whole dynamic can pick out a little piece here and there and say this is not good.” (1212) The narrative here seems to be that despite fracking being a safe, beneficial activity, if one looks hard enough, one can find something to complain about. Once again, the narrative allows pro-fracking residents to simplify and dismiss contaminated water allegations made by others.¹⁶⁴

Regardless of whether there have been only a handful of instances in which fracking activities actually led to water contamination, or whether there have been “thousands and thousands and thousands of other lives that they’ve affected” (1014), the use of NDAs contributes to an atmosphere of uncertainty that allows dueling narratives to further muddy the waters.

¹⁶⁴ This is not to suggest that many of the anti-fracking interviewees did not embrace shared narratives that tended to characterize and oversimplify.

5.3.7 Retaliation and other disincentives to filing claims

In addition to NDAs, the spread of information about sexual harassment is hindered by well-grounded concerns about retaliation, along with a lack of faith in the institutions meant to help victims. Many of those who have been subjected to the kind of misconduct that sexual harassment laws and policies are meant to redress, elect not to avail themselves of those remedies for fear of other negative consequences that often result from doing so. Although electing not to speak up about harassment allows serial harassers to persist in their behavior, one can hardly blame victims for remaining silent about what they have experienced. The fear of retaliation is a particularly powerful motivation to maintain silence, and one that is very rational.¹⁶⁵ While lawmakers have created protections against retaliatory terminations in these situations,¹⁶⁶ the retaliation a victim may face after speaking up can manifest in many other ways.¹⁶⁷ Diminished support from management and social ostracization, for example, might arise in response to a sexual harassment claim.¹⁶⁸ But such subtle behaviors would likely be difficult, if not impossible, to prove as part of a retaliation claim, rendering legal protection against retaliation of little value.¹⁶⁹

¹⁶⁵ Mizrahi, *supra* note 14, at 137.

¹⁶⁶ *Id.* at 137-38.

¹⁶⁷ *Id.* at 137.

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

Although the emotional and psychological impacts people experience when harmed by fracking differ significantly from those experienced by sexual misconduct victims, the factors dissuading them from complaining or pursuing legal remedies bear some resemblance. One resident, for example, spoke of retaliation she experienced for complaining about noise, and subsequently, for speaking to the media. She said that her initial complaints were ignored by the company and the township, but she was finally able to get a DEP representative to speak to the well operators on her behalf. “He went over there and talked to them and said, ‘you know what, can you at least let the people sleep a little bit, can you knock it off at around like 7 o clock?’ That night, it was so loud, it seemed like it was worse.” (1233) Because the situation had not improved, and her husband, who was recovering from a heart attack and a stroke, could not get sufficient rest, she went to the local news with her story. Shortly thereafter, the well operator provided her with numbers to call if she had any further complaints. “They’ve said, ‘if you have problems call us’ because I called the media the last time. I don’t know if you found me on WXPI, it’s on there somewhere with me complaining about it. And you also see all the gas well trolls writing nasty things about me underneath – ‘she’s probably just a welfare chick,’ ... ‘looney tune will do anything for attention’ – like I really wanted to have attention.” (1233) She noted that her daughter had actually tried to dissuade her from going on the news for fear of having the company or pro-fracking community members retaliate.

Another resident, who experienced a variety of issues associated with a well on an adjacent property, also spoke of retaliation he faced in response to his complaints.

You become a nuisance because you're interfering with their activity, their production. So you become the bad guy. And then that's when it all hits the fan. You start out – you're a good guy if you leave them alone and don't say nothing but wave, you're a good neighbor. But soon as you have an issue with the dust, the traffic, getting run off the road, whatever it might be, spills, odors, dust, noise – you're now bad. Then you're labeled, then it starts: the bad guy, the terrorist, have me arrested, harassment – they throw everything at you. (1402-B)

Alongside concerns about retaliation, some victims of sexual harassment might refrain from seeking redress because sexual harassment is so common that it is simply something they ultimately accept as part of life.¹⁷⁰ That is, because women experience harassment in one form or another so frequently, it is not always clear what constitutes the kind of behavior that arises to the level of an actionable complaint. Therefore, outside of the most egregious situations, many targets of harassment simply accept that it is part of life, and endure. A similar mentality can be seen in how some residents in southwest Pennsylvania accept pollution as a given. “The problem with this area is we've had industrialization, we've had the steel mills and the coal mines, and we've had this going on for years, and oil was discovered up in Tionesta or Titusville, wherever -- and so people are kind of like, 'well, that's just how things are.'” (1005) “[W]e kept running into that attitude: 'oh you should have seen what it used to be like.' And again,

¹⁷⁰ Akel, *supra* note 138, at 112.

it's not everybody but it was kind of like, you mention it to your neighbor, 'hey you smell this?' 'Smell what?' 'The sulfur! In the air.'" (1014)

Another reason that sexual harassment victims sometimes elect not to file a complaint comes from doubts about whether their claims will be believed.¹⁷¹ Because such allegations have often been treated with various degrees of skepticism, coming forward carries with it not only the potential for retaliation and other negative consequences, yet without any assurance that the offending behavior will be addressed.¹⁷² Therefore, if a victim questions whether her claim will be believed, or worries that the process will devolve into a he-said-she-said credibility contest, it reduces the incentive to speak up in the first place. Likewise, not having their claims believed was a common theme amongst residents who had called gas company helplines to report issues. One resident spoke of an incident in which he walked outside into a cloud of gas on his street, which immediately triggered a severe respiratory episode. When he got back inside and called the gas company, the representative "busted out laughing on the phone." (1420) The representative then told him that because he had not gotten a call from the well site, what he experienced simply could not have happened. This resident was one of several interviewees to claim that

¹⁷¹ *Id.* at 108

¹⁷² Hébert, *supra* note 9, at 323.

representatives who answered the helplines summarily dismissed any concerns as impossible.

Given the myriad disincentives outlined above, it is not surprising that researchers estimate that only 6 – 13% of sexual harassment victims file a formal complaint.¹⁷³ This reluctance to engage with the legal system or their companies' internal compliance programs demonstrates a lack of trust in the institutions ostensibly in place to provide assistance in these situations.¹⁷⁴ Studies have demonstrated the importance of trust in governments and institutions, and that the lack of trust can have significant negative repercussions.¹⁷⁵ Because perpetrators are often powerful, economically valuable members of a company, victims cannot be blamed for being wary about seeking help from that company's internal compliance program. It is well established that victims often face negative employment outcomes as a result of lodging complaints, while economically high-value perpetrators are protected.¹⁷⁶ Some victims might reasonably conclude that if the organization does not value them as highly, it will not protect them. Counterintuitively, one study into sexual harassment reporting found that complaints from high-ranking victims were actually less likely to trigger an

¹⁷³ Chai R. Feldblum & Victoria A. Lipnic, U.S. Equal Emp't Opportunity Comm'n, Select Task Force on the Study of Harassment in the Workplace, Report of Co-Chairs 16 (2016).

¹⁷⁴ Mizrahi, *supra* note 14, at 125-26.

¹⁷⁵ Anne Marie Warren, et al., *Social Media Effects on Fostering Online Civic Engagement and Building Citizen Trust and Trust in Institutions*, 31 GOV'T INFO. Q. 291, 292 (2014).

¹⁷⁶ Hébert, *supra* note 9, at 323-24.

organizational response than those from lower-ranking employees.¹⁷⁷ However, the researchers suspect that the reason for this is that high-ranking victims are necessarily harassed by even higher-ranking employees, whom the organization would be the most motivated to protect.¹⁷⁸

5.3.8 Reduced faith in institutions

Any mistrust that victims of sexual misconduct might feel towards institutions meant to render justice or protect them from retaliation would appear to be well-founded. The failure of organizations to respond to sexual misconduct allegations has been demonstrated repeatedly in recent years. In one of the most notorious examples, the failures of USA Gymnastics and Michigan State University to respond to complaints by gymnasts allowed Larry Nassar to sexually abuse minors for decades.¹⁷⁹ Another recent lawsuit revealed that a culture of secrecy, fostered by corporate executives, eventually convinced employees at Wynn Resorts to conclude that filing complaints was pointless.¹⁸⁰ Finally, court filings in a gender discrimination lawsuit filed against

¹⁷⁷ Bergman, *supra* note 55, at 236.

¹⁷⁸ *Id.*

¹⁷⁹ Dvora Meyers, "For 20 years, Gymnasts Said Their Doctor Was Sexually Abusing Them – And Nothing Happened", *Deadspin* (Feb. 24, 2017), *available at*: <https://deadspin.com/for-20-years-gymnasts-said-their-doctor-was-sexually-a-1792697880>.

¹⁸⁰ Ray Sanchez and Sonia Moghe, "Wynn Resorts executives concealed sexual misconduct accusations against Steve Wynn, gaming regulators say", *CNN* (Apr. 3, 2019), *available at*: <https://www.cnn.com/2019/04/03/us/wynn-resorts-massachusetts-gaming-commission/index.html>.

Microsoft revealed that out of 118 gender discrimination complaints filed over the course of six years, the company only considered one to be “founded.”¹⁸¹

That only one of the 118 gender discrimination complaints was taken seriously by Microsoft’s human resources department raises questions not unlike those raised by many residents in Pennsylvania, who allege that of the many water contamination complaints made to DEP, only a small percentage officially are ever linked to gas extraction activities. These residents have very little faith that the state’s environmental enforcement agency is making good faith efforts to determine whether fracking operations are affecting their water. “They were pretty good, they ought to be counselors. They feel for you, they’re going to do something about this, this is wrong, and report comes back, it’s always in favor of the industry. There’s never no findings, nothing conclusive. They’ve covered up.” (1402-B) “I just told you, they’ll come out to people’s houses and say it’s not caused by fracking ... I mean, because they’ve got their criteria very narrowly constructed, that they can -- I mean, I’m sure they have a protocol that they follow, but how good, is that really making a good determination?” (0_1101) “Anyway, the DEP had sort of two tests they used. One was a full battery that included -- it would cost a lot of money, but it would test for the fracking chemicals, which is what we all wanted to know. They had another test which didn’t test for the fracking.

¹⁸¹ Dan Levine, “Microsoft women filed 238 discrimination and harassment complaints”, Reuters (March 12, 2018), *available at*: <https://www.reuters.com/article/us-microsoft-women/microsoft-women-filed-238-discrimination-and-harassment-complaints-court-documents-idUSKCN1GP077>.

But they were using the test that specifically left out fracking-culpable type of chemicals, and then coming in saying, 'your water is fine.'" (1014) "It says it can't be from the drilling; it actually says at the end 'while we don't think it was the driller, you have serious problems with your water, and you should probably look into that.' That's what it says. So [he]'s been in litigation for four years now." (1320)

In fact, many residents, even some who support fracking, believe that Pennsylvania's interest in generating revenue from gas extraction creates an incentive for the state to err on the side of gas companies when issues arise.

And you know, DEP is about the business of permitting, making sure the permits go through, and they fill out the forms out right -- and I mean, I have to say, I was pretty naive about government before I got involved in this. I thought the government would work for us -- you know you get involved, you speak up, it'll work for you. And that's not been my experience at all. Especially when there's money to be made at the state level. And so the governors, all the governors I think, were wanting this. They wanted it here, they wanted the economic benefits of it. (1005)

A consistent conclusion among fracking opponents is that the government institutions in place to protect the citizens have failed to do so. "No way. Nobody, not the local, clean to the feds. There's no help there at all. None." (1402-B) "The DEP permits the company down here taking waste in Masontown to completely dump the shit in there -- and issue another permit the next year. How? How? Please tell me. These people aren't here for us. They're not here for us." (1317) Many residents' dissatisfaction with Pennsylvania state agencies arose as a result of their own experiences, and some are eager to derisively declare that DEP actually stands for "don't

expect protection.” But while some residents feel that DEP’s perceived shortcomings are the result of a lack of funding or manpower, others believe that they work to ensure that harms caused by the gas industry do not generate publicity: “people who notice that they’ve got water issues complain to DEP, and DEP, according to [investigative reporters],¹⁸² bury those complaints so as to make the whole notion of water issues associated with drilling appear to be much smaller than it really is.” (1701) Regardless of whether such allegations are true, it is clear that many residents’ faith in governmental institutions has eroded as a result of their experiences with fracking.

Even setting aside allegations that DEP is deliberately underreporting water contamination incidents in order to protect an industry that is economically valuable to the state,¹⁸³ many residents feel as though the gas industry gets special treatment.

Like it’s a fact that the industry in Pennsylvania has been fined over 3,000 times -- fined over 3,000 times -- that’s just when they’ve been caught for infractions. Like, how many times have they got away with it? But back to the 3,000, it’s hard to think of many other industries that that would be allowed -- that lawmakers would put up with those kinds of tallies. And yet they do, because the ... money sustaining, creating that kind of power... (1902-A)

5.3.9 Realities of litigation

While internal reporting systems do not appeal to many sexual harassment victims for the reasons outlined above, the legal system does not necessarily offer a

¹⁸² Public Herald, *available at*: <https://publicherald.org/triple-divide/>.

¹⁸³ *See id.*

better option. Pursuing redress via the courts can be an expensive endeavor, and concerns about legal fees can be sufficient to keep some victims from considering it as an option.¹⁸⁴ Furthermore, the prospect of getting into a he-said-she-said conflict might dissuade some attorneys from taking the case.¹⁸⁵ The same might be said for prosecutors considering criminal charges, as they may be wary of getting into a credibility contest.¹⁸⁶ Similar concerns about financial repercussions and lawyer availability also discourage some people who have been harmed by fracking activities from engaging with the legal system. Many people near fracking operations in rural Pennsylvania live at the edge of poverty, and perceptions of legal fees are a powerful disincentive. “They think it will probably cost them more money than they can make because they need an attorney and all that kind of stuff.” (5_1143) Hearing residents who have been harmed speak so pessimistically about their prospects of being made whole contrasts sharply with those who suggested that water contamination claims are cynical sue-and-settle schemes meant to defraud the gas companies. One landowner, who had actually filed a lawsuit, outlined his understanding of the financial situation:

Okay, so if you do get somebody that works on a contingency basis, it’s 40%. Okay, so you take 40%. First of all, medical is out of the question. Trying to prove medical, this is still too new. Ain’t happening, ain’t happening. My opinion. So you go nuisance, you know what your tax bracket is on nuisance? You pay 35%. So if you sue for \$100,000, you’re

¹⁸⁴ Akel, *supra* note 138, at 108.

¹⁸⁵ See Mizrahi, *supra* note 14, at 137-38.

¹⁸⁶ Melissa Murray, *Consequential Sex: #MeToo, Masterpiece Cakeshop, and Private Sexual Regulation*, 113 *Nw. U. L. REV.* 825, 857-58 (2019).

getting a lawyer 40, and 35 for the feds. You end up with \$25,000, and then in the end they want to sign everything away, all your rights for any kind of medical -- it ain't happening. In nuisance, it's small money. It might sound good, say you're getting \$100,000, but you ain't getting 100, you're gonna get 25. So how's it even helping you? And now you gotta sign away that they can rape you again. (1402-B)

This interviewee still pursued a claim, not because he thought he would be financially better for it, or that his injuries would be compensated. Instead, he hoped to get his "day in court," and to make what happened to him part of the public record. He was very critical of the use of NDAs to keep gas company reputations clean, and wanted more than anything to bring attention to the widespread harms for which he considered the industry responsible.

The expense of litigation, coupled with pessimism about what could actually be recovered via litigation, may explain, to an extent, why some landowners have been unable to secure representation for nuisance actions. One man, who, based on the evidence he produced during the interview, appeared to have an actionable claim, also produced four letters from different attorneys or firms declining to represent him. Although these letters did not specify why they were declining, the cost of litigating his case, when considered alongside the chances of prevailing, might have played a role. Other interviewees also claimed that landowners struggled to find attorneys to represent them, speculating that local attorneys are conflicted out due to industry ties. "So a lot of attorneys end up working for oil and gas. So then, if you're trying to say

they are doing some wrongdoing to you, there are not many attorneys that have the capacity to take those new cases on, because they are already booked.” (1556)

Setting aside any financial concerns, many instances of sexual harassment would be difficult, if not impossible to prove in court.¹⁸⁷ Many forms or instances of sexual harassment inherently leave little, if any, tangible evidence. Without such evidence, and without corroborating witness, claimants struggle to prove their claims in court.

Awareness of this difficulty dissuades some victims from seeking redress via the court.

Similarly, the challenges in proving causation in a water contamination case have not been lost on many residents whose water has gone bad. “Based on DEP’s way of thinking at the time, there was no --... the legal way of thinking was since the water hadn’t been tested before, there was no proof it was because of the oil companies. The chemicals obviously didn’t come from anywhere else. These people lived there for a long time and never gotten sick, so it was ridiculous. It was just one of those legal loophole things.” (1014) “Well I’ve just seen it in other cases down in Washington County and another case here in Butler County. And, it’s just a very difficult thing to prove. You know, because we’re dealing with scientific and expert analysis, etcetera, etcetera. And I think the deck is stacked against the individual.” (1102) None of the residents interviewed for this study were attorneys,¹⁸⁸ and their understandings of

¹⁸⁷ Mizrahi, *supra* note 14, at 139.

¹⁸⁸ One interviewee had worked as a paralegal in a Pittsburgh law firm, however.

causation or burdens of proof were predictably varied. But nearly all were consistent in believing that proving a sufficient connection between contaminated water and a particular fracking well, so as to prevail in litigation, would be unlikely.

5.4 Possible solutions in the fracking context

Despite the strange parallels that the systematic use of NDAs has helped create between sexual misconduct claims and water contamination claims, addressing each issue requires taking into account the nuances of each context. Scholars have analyzed the NDA problem in each context, but the recent surge of attention to their use in sexual misconduct settlements has prompted more scholarship, and thus, more proposed solutions. Drawing on those proposals, this chapter focuses on how similar solutions might alleviate some of the negative consequences of systematic use of NDAs in the fracking context.

5.4.1 Legislative solutions

Because the MeToo movement gained so much publicity, it galvanized legislators into passing or proposing legislation to minimize the harmful impacts of NDAs, something that has not happened in the fracking context. It makes sense, then, to first examine a sampling of those legislative efforts and analyze their likely effectiveness in each context. At the federal level, the Tax Cuts and Jobs Act of 2017 contains a provision that states: “[n]o deduction shall be allowed under this chapter for (1) any settlement or payment related to sexual harassment or sexual abuse if such settlement or

payment is subject to a nondisclosure agreement, or (2) attorney's fees related to such a settlement or payment."¹⁸⁹ Although this new provision does not restrict or render unenforceable nondisclosure provisions in settlements, it does make them more expensive. The effect this provision will have on the number of settlements containing NDAs remains to be seen, but one study estimated that from 2010-2016, employers paid out almost \$700 million via the Equal Employment Opportunity Commission's administrative enforcement prelitigation process, which would not account for settlements outside of that context.¹⁹⁰

Another piece of federal legislation that has been introduced is the Sunlight in the Workplace Harassment Act ("Sunshine Act"),¹⁹¹ which would require publicly held companies to disclose the number of settlements and total amount paid to settle sexual misconduct claims.¹⁹² The Sunshine Act, as introduced, does not apply to privately held companies, such as the Weinstein Company, so its effectiveness would be limited.¹⁹³ But this type of mandatory disclosure legislation would improve, to an extent, the accuracy of statistics related to sexual misconduct in the workplace, and would draw attention to those companies with a particularly high frequency of complaints. However, it might not create enough of an incentive to avoid using NDAs when high-profile executives are

¹⁸⁹ I.R.C. § 162(q).

¹⁹⁰ Hoffman & Lampmann, *supra* note 27, at 24.

¹⁹¹ Sunlight in Workplace Harassment Act, S. 2454, 115th Cong. (2018).

¹⁹² Aronson, *supra* note 28, at 1206-07.

¹⁹³ *Id.* at 1208.

involved. Were the Sunshine Act to be passed, the information generated would still be valuable, and it could ultimately serve as a model for a similar disclosure bill addressing settlements arising from fracking claims. But in order to effectively address the nuances of the fracking context, such a bill would need to break down the required disclosures into, for example, categories of alleged injury, such as water contamination, and geographical information, such as the number of claims made per county. Doing so would provide at least some information on those companies that have the worst track records in terms of the number and severity of incidents, which would be useful for landowners who are considering signing leases. At the same time, legislators and government agencies would gain a better understanding of the risks fracking poses to human health and the environment. Although companies sometimes prefer to dispose of claims through settlement, even when they are not at fault, the additional information generated by this kind of disclosure law would be of considerable value.

At the state level, as noted above, several bills have been proposed or passed that directly aim to limit or eliminate the use of NDAs in settlements arising out of sexual misconduct claims.¹⁹⁴ Scholars who have analyzed these bills have mixed opinions when forecasting their ultimate effectiveness. For example, although California's SB820 renders unenforceable those NDAs arising out of claims filed in court or in an

¹⁹⁴ See Tippet, *supra* note 11.

administrative proceeding, it does not address pre-filing claims.¹⁹⁵ Thus, those harassers who move quickly to reach an agreement before a claim is filed can still include an NDA that allows them to keep their conduct from being publicized.¹⁹⁶ A similar bill passed in New York, which effectively prohibits NDAs that victims do not affirmatively agree to after a post-negotiation waiting period.¹⁹⁷ But while the New York rule might mitigate the coercive bargaining tactics that lead many victims to agree reluctantly to NDAs, it does not protect third parties who might be similarly harmed by a harasser whose actions have been concealed.¹⁹⁸

With regard to NDAs in the fracking context, some states currently have laws that render unenforceable any contract provision that conceals a public hazard or environmental hazard.¹⁹⁹ Laws such as these would seem to offer a simple solution to the problem, provided they are carefully drafted to encompass settlements that implicate the kinds of issues landowners have had with fracking operations. However, given the economic benefits fracking can bring to a state, it might prove politically infeasible to pass such legislation in fracking-heavy states. It seems unlikely, for example, that the Republican-controlled Pennsylvania legislature would pass a bill specifically tailored to keeping gas companies from being able to enforce NDAs.

¹⁹⁵ *Id.* at 267-68.

¹⁹⁶ *Id.*

¹⁹⁷ Hoffman & Lampmann, *supra* note 27, at 4-5.

¹⁹⁸ *Id.* at 5.

¹⁹⁹ See Florida and Arkansas, *supra* notes 105-106.

Another concern with broadly rendering NDAs unenforceable by statute is that it may serve as a disincentive to settlement for the party most financially able to sustain prolonged litigation. Along similar lines, many defendants consider the privacy benefits of an NDA to be worth paying additional compensation to plaintiffs. Therefore, knowing that an NDA would be unenforceable will take away that privacy incentive, and lead to lower settlements for plaintiffs. In that sense, a solution that benefits third parties and society at large would lead to injured parties being compensated less. However, given the asymmetric bargaining power, as well as the value some claimants put on being able to discuss their experiences, it is not clear how much this balance would shift were NDAs not available as points of negotiation.

5.4.2 Judicial solutions

Even without such legislation, courts could simply apply the Restatement balancing test, and find NDA provisions to be void as against public policy.²⁰⁰ The arguments for doing so, as discussed above, are compelling in each context.²⁰¹ This approach allows the parties to contract as they wish, while still maintaining privacy and confidentiality if it is in their interests to do so. If, however, claimants subsequently decide to speak about their experiences, they will not be penalized for it. One advantage

²⁰⁰ See *supra* notes 97-123, and accompanying text.

²⁰¹ See *id.*

of this approach is that instead of requiring political action, courts would simply address these cases as they come.

But relying on courts to find NDAs unenforceable creates unpredictability for both parties. Defendants willing to pay extra for a promise of silence would not have sufficient assurances that this promise will be kept. On the other hand, claimants choosing to speak up in spite of an NDA would have to trust that a court reviewing the issue, and analyzing the public policy exception, would find in their favor. Furthermore, as is the case with the legislative approach, defendants who harbor doubts that an NDA will be enforced, might be less inclined to settle in the first place. Furthermore, if claimants elect to honor the NDA, and remain silent about their experiences, third parties lose the benefit of information that might protect them from similar harm. Thus, claimants gain the right to express themselves if they so choose, but this solution does not necessarily address the third-party externality issue.²⁰²

5.4.3 Partial disclosure requirement

Instead of rendering NDAs unenforceable legislatively or judicially, states could condition their enforceability on the submission of reports detailing the underlying claims. These reports would contain details regarding the nature of the claim, as well as an approximate location, but would omit additional identifying details. Upon

²⁰² See Hoffman & Lampmann, *supra* note 27, at 41.

submission, a state department of environmental protection²⁰³ would both publish the details of these reports on their website, and aggregate data from all such reports to be published in a user-friendly manner. Creation of this kind of database would respect parties' contractual expectations and preserve privacy, but would not enable suppression of information regarding public health and environmental risks. Therefore, the goal of the public policy exception to contract enforcement – protecting the public from risk of harm – would be met without reducing the parties' incentive to settle or diminishing their privacy expectations.

5.4.4 Combining the solutions

Given the myriad, and often conflicting, interests involved, the ideal path forward would be to adopt a combination of the solutions that have been presented above. This chapter proposes adopting comprehensive federal and state sunshine laws for the fracking context, along with the establishment of incident information databases. This combination maximizes the information available to third parties, which addresses the most problematic repercussions of NDAs, while minimizing burdens on privacy and the freedom to contract.

Sunshine laws that require companies to report the number of claims and the amount of money paid to settle fracking-related claims, provided they were subject to an

²⁰³ To combat concerns raised about agency capture, particularly when state tax revenue benefits from fracking activity, it may be necessary to appoint an ombudsman to monitor fracking-related matters.

NDA, would serve the same purposes as other information disclosure laws. They would allow the public and market forces to exert pressure on companies, they would provide information to legislatures about the extent of these issues, and they would alert investigative authorities of those entities with particularly poor performance. Likewise, maintaining a database that details the nature of underlying claims would have similar effects, while also providing the kind of risk information that members of the general public would find most useful. Setting aside the political challenges involved in passing this kind of legislation, the fracking context has a particular need for increased information availability.

5.5 Conclusion

That such wildly dissimilar situations as sexual misconduct and fracking nevertheless have so much in common highlights the fundamental problem with using the freedom to contract to hide public hazards. But this chapter does mean to suggest that all NDAs should be rendered unenforceable. The use of NDAs to protect intellectual property or trade secrets, for example, can be a perfectly valid exercise of the freedom to contract.²⁰⁴ The concerns and remedies addressed here apply only to situations in which third parties might be harmed as a result of an NDA concealing

²⁰⁴ Although many would argue that fracking operators who avail themselves of trade secret protections to protect the precise composition of fracking fluids are doing so in a bad faith attempt to conceal the hazardous nature of these fluids.

information that implicates a public safety risk. For those arising out of medical malpractice, products liability, or other contexts where the potential for concealment of public safety risks is higher, it may also be possible to condition their enforceability on the establishment of information-forcing mechanisms like the one proposed above for fracking. How such a mechanism would be tailored to fit those contexts is beyond the scope of this chapter, but extending the notion of conditioning enforceability in this manner may be worth considering. By keeping in mind those who are not party to the contract, yet may be hurt by its enforcement, courts and policymakers can balance the freedom to contract with the importance of making available information relevant to public health and safety.

6. Perceptions of risk and the fairness of fracking-related tort suits

Do you know how much -- I mean, the amount of money and the amount of time and the amount of stress that people go through -- who have to go through these lawsuits? They've already been harmed once, then sometimes the legal system screws them. Again. (1005)

-- Resident of southwest Pennsylvania, on bringing a fracking-related tort lawsuit

Pursuing a tort claim can be an expensive, stressful process that most people would very much prefer to avoid. But in those rare situations in which an injury is sufficiently severe that seeking a remedy via litigation feels necessary, people need to trust that the legal system will deliver a fair outcome. Fairness is the foundation of the legal system, and the basis for its legitimacy, but the notion of fairness is inherently subjective (Berrey et al., 2012). A substantial body of literature, known as procedural justice, suggests that perceptions of fairness hinge more on how litigants feel they are treated than on whether the outcomes are favorable (Lind, 1990). However, these conclusions have been questioned by an emerging literature, known as situated justice, which posits that notions of fairness are subject to contextual factors that are not being accounted for in the procedural justice literature (Berrey et al., 2012). Berrey et al. argue that because much of the procedural justice literature is grounded in hypotheticals tested in lab studies, far away from the realities of adversarial litigation, it fails to adequately explain how individuals actually perceive fairness after having spent time navigating the legal system. By interviewing individuals who have gone through the

litigation process, they offer a more complex, nuanced perspective on the factors that individuals weigh when considering fairness. Focusing on litigants in the employment discrimination context, Berrey et al. identify power asymmetries and structural biases as among the important drivers of perceived fairness.

Taking a similar approach to that of Berrey et al., the present study sought to understand how individuals living in communities affected by hydraulic fracturing (“fracking”) operations perceived the legal system as a viable avenue for compensation in the event of fracking-related harm. However, instead of focusing on those who had already sought remuneration via litigation, this research examined the perspectives of individuals who considered themselves at risk of harm from fracking operations, but who had not suffered a tortious injury. The goal of the research was to understand how risk perception might influence perceptions of the legal system. By grounding the research in a context where participants sincerely believe that they might suffer harm in the near future, it yielded unique insights into how judgments of fairness are made.

Fracking describes the process in which fluids are forced at high pressure deep into a well in order to release the gas that is trapped within the rock (Fisher, 2015). Although oil and gas operations have utilized hydraulic fracturing techniques since the 1940s, they began to revolutionize the American energy extraction industry in the late 1990s, when fracking was combined with horizontal drilling (Garmezzy, 2013). This combination allowed access to “unconventional” shale reserves that had previously

been considered economically unfeasible to extract. As a result, the number of natural gas wells in the United States has risen dramatically in the past two decades, and is expected to increase in the near future. But this increase has been accompanied by a vociferous anti-fracking movement. The primary concerns of fracking opponents arise from the potential for harm to human health and the environment (Nolon and Gavin, 2012). They argue that widespread fracking will give rise to, among other things, ground and surface water contamination, air pollution, noise pollution, earthquakes, and road congestion. Proponents of fracking, in turn, dispute these concerns by claiming a dearth of reliable scientific data, and by challenging the anecdotal nature of many of these claims (Spence, 2013).

Fracking's potential to negatively impact human health and the environment is both highly publicized and highly controversial. Because the fracking boom outpaced the research on its risks, there remains no consensus on the nature or extent of its potential harms. But there has been no shortage of individuals claiming harm from fracking, and there have been almost 150 fracking-related lawsuits filed in the United States (Watson, 2019). Thus, fracking provides the ideal context to explore perceptions of the legal system, as many residents of communities affected by fracking consider it to be a very real risk to their health and safety. Although the findings described below tend to align with the notions of situated justice, this study provides an important contribution to the literature by examining how those who consider themselves at risk of

needing to seek compensation for injury perceive the legal system's likelihood of delivering a fair outcome should they choose to engage with it.

6.1 Risk perception

Traditionally, risk has been defined as the likelihood of a particular harm, multiplied by its magnitude or cost (Walker Wilson, 2011; Sjöberg, 2004). In many contexts, risk is expressed in terms of the estimated number of deaths, something that can be incorporated into a traditional cost-benefit analysis (Walker Wilson, 2011). But while these measures of risk may appeal to economists and policymakers, they do not accurately reflect how most people actually perceive risk (Sjöberg, 2004). One body of literature contends that risk perceptions are formed, at least in part, by mental shortcuts, also known as heuristics. Because people lack the time, energy, information, and quantitative capacity necessary to assess risk with more precision, these heuristics allow for quick, efficient assessments of risk. Although these heuristics have been amply studied and demonstrated (e.g. Finucane et al., 2000; Kuran and Sunstein, 1998), some scholars question whether they play a significant role, on their own, in how individuals perceive risk, or whether they make smaller contributions as part of a larger cultural theory of risk (*see* Kahan, 2012). Regardless of the particular mechanisms involved, there is a general consensus that risk perceptions of the general public tend to diverge from expert risk assessments with regard to many risks (Breyer 1993; Sjöberg 2004; Walker Wilson 2011).

6.2 Tort law and fracking-related claims

The tort system seeks to compensate injured parties and deter undesirable behavior (Restatement (Second) of Torts at § 901). Much ink has been spilled about the usefulness of those goals from the perspective of tort theory, as well as the ability tort system to realistically achieve them (Cheit, 2008). However, it is important to note that studies investigating plaintiffs' motivations for pursuing tort litigation have found that financial compensation is not always the primary goal (Heaton et al., 2015). In fact, many other concerns take primacy, including the desire for accountability, acknowledgement of harm done, information, and policy changes. Likewise, although potential litigants, as well as the general public, may have a tendency to view litigation as ending in win-loss jury verdicts, most cases end up settling (Dore, 1999; Eisenberg and Lanvers, 2009). In the oil and gas context, most of those settlements contain nondisclosure agreements, which often constrain the parties' ability to discuss the circumstances that led to the settlements (Fisher, 2015). Systematic use of nondisclosure agreements can undermine the deterrent function of the tort system, as the lack of publicity about a defendant's prior behavior subverts the accountability that comes with public scrutiny (Cheit, 2008).

Plaintiffs have brought dozens of common law tort claims in response to injuries allegedly sustained as the result of fracking operations (Goldman, 2013). Most of these toxic tort claims arise from the contamination of groundwater. Plaintiffs typically allege

that their private water wells became contaminated shortly after the commencement of nearby drilling. The most common of these lawsuits allege private nuisance, trespass, and negligence. The outcomes of these suits vary considerably, but establishing causation has been a consistent and conspicuous obstacle (Ehrman, 2014). Causation is notoriously difficult to prove in toxic tort claims, (Gold, 1986) and can often devolve into a battle of experts, whose testimony often appears less grounded in scientific objectivity, and more akin to advocacy on behalf of the parties paying them (Robertson, 2010).

6.3 Procedural and situated justice

The legitimacy of the American legal system is dependent on the public perception that it functions in an equitable manner (Berrey et al., 2012). Widespread perception that the legal system is unfair risks eroding faith in governing institutions. Over the years, a substantial body of literature had developed to analyze how litigants perceive the fairness of the litigation and the legal system (see Jenness and Calavita, 2018). Despite the natural assumption that individuals will base these judgments of the legal system on how favorable they consider the outcomes, scholars have consistently found that if people perceive the litigation procedures to be fair, they will be more likely to be satisfied with the outcome, regardless of its favorability. The fairness of these procedures has been dubbed procedural justice. Tyler (2006) identifies four factors that influence perceptions of procedural fairness: (1) an ability or forum in which to tell their story; (2) neutrality of authorities; (3) being treated with dignity; (4) sense that

authorities are trying to do what is best. These procedural justice factors, it is argued, influence perceptions of fairness more than objective outcomes, such as verdict amount, cost of litigation, and duration of litigation (Lind, 1990).

Although a number of studies have indeed found a correlation between perceived procedural fairness and outcome satisfaction, subsequent research has begun to carve out exceptions to this finding. For example, Lind et al. (1990) determined that perceptions of fairness and satisfaction with outcome are highly subjective, and are dependent on a party's initial expectations. Furthermore, "[l]itigants may well view their case not as a dispute about outcomes but as a clash between their own view of reality and an opposing, apparently erroneous and sometimes malicious view of reality." (981) Rather than viewing outcomes as objective, as other studies had done, the researchers determined that different parties might perceive the same outcomes very differently. These findings align well with social exchange theory, which posits that satisfaction rests not only on objective outcomes, but instead on how those outcomes are evaluated against personal expectations and values.

Another framework for evaluating perceptions of justice is that of situated justice, which posits that litigants' notions of fairness are informed by structural advantages and disadvantages that influence their experiences with the legal system (Berrey et al., 2012). Situated justice questions the assumptions made by previous scholarship about litigants' notions of fairness, and considers that purportedly neutral

legal rules often result in inequities that are difficult to perceive outside the context of actual litigation. One criticism of early research on procedural fairness came from its reliance on lab settings, insulated from any factors that go beyond a mere abstract sense of fairness. By taking into account the social, cultural, and other structures that arise in a given litigatory context, situated justice aims to develop a fuller picture of how individuals develop perceptions of the legal system's fairness. Berrey et al. (2012) identify a litany of factors that inform whether an individual might engage the legal system, including knowledge of having been actionably harmed, access to lawyers, and discomfort with being labeled a victim. Likewise, social standing, age, and access to resources are among the social and cultural factors that play a role. Thus, the legal system establishes not only formal rules of civil procedure, but also subtler parameters that can have disproportionate impacts on participants, and on how they perceive their experiences with litigation or negotiation.

Of particular relevance, Berrey et al. (2012) examine perceptions of fairness in the context of employment litigation, which they posit is similar to torts and environmental litigation in the sense that lawsuits, rather than regulations, are the means of enforcing compliance. They also highlight asymmetries in the employment litigation context that very easily translate to toxic tort, such as the psychological asymmetry between powerful employers and less powerful employees, which are compounded by asymmetries in litigation experience, access to resources, and emotional distance from

the dispute. By conducting interviews with litigants, Berrey et al. were able to gain valuable insight into the experiences of litigants. For similar reasons, the present study used interviews to go beyond the data available on well violations and filed lawsuits, and explore how residents living in communities affected by fracking perceive the fairness of legal system that addresses fracking-related claims.

6.4 Research design, data collection, and analysis

The purpose of the research was exploratory, as perceptions of fracking-related lawsuits and legal remedies had not been investigated previously. The goal was not to test hypotheses, but rather to gain insight into individuals' experiences with fracking, and identify patterns and themes that could lead to the development of theories about how they interpret legal outcomes (Strauss and Corbin, 1998). Research proceeded using semi-structured interviews that facilitated in-depth examination of topics, and allowed for the flexibility to explore additional themes that emerged during the course of the study. Subsequent analysis of the interview data adhered to the grounded theory method, which was developed as a means of constructing new theories directly from data (Timonen et al., 2018). The grounded theory method does not rely on the development of *a priori* categories into which the data must be sorted, but instead requires continual analysis of data during the study, which allows themes and categories to emerge and evolve as the data accumulates.

Although fracking takes place in several states, Pennsylvania was identified as presenting the best opportunity to explore the study's principle questions. Pennsylvania not only has thousands of fracked wells, but many of its residents have alleged water contamination incidents related to fracking. Some of those incidents have led to high profile lawsuits and media coverage. Because fracking has been most intense in the northeastern and southwestern portions of Pennsylvania, interviews were divided among residents living in those two areas.

Study participants were selected purposively to ensure that interview data was relevant to the questions of interest (Cleary et al., 2014). Therefore, the study included only participants who lived in communities subject to the risks posed by fracking activities. Interview participants were recruited using both convenience sampling, in which qualified participants were identified by happenstance (Robinson, 2014), and snowball sampling, whereby participants recommend other potential participants. For controversial topics, snowball sampling is particularly appropriate, as participants may be hesitant to respond to advertisements (Robinson, 2014). Interviews proceeded until they ceased yielding new concepts and themes, signaling saturation (Cleary et al., 2014). This process ultimately resulted in a sample size of 38 interviews (33 of which were recorded, for a total of 40 interviewees recorded), consisting of 47 individuals. These participants represented a variety of economic and professional backgrounds, including farmers, small business owners, teachers, and mechanics.

Interview durations varied, but typically lasted between 30-75 minutes. Those participants who consented to being recorded were provided with a consent form, a signed copy of which was kept by the researcher. The Institutional Review Board reviewed and approved of this consent form prior to conducting any interviews so as to ensure protection of those participating in the study. The researcher began interviews by asking participants to offer general thoughts on fracking. This prompt was intentionally open-ended in order to get detailed background information on what experiences, if any, participants had with fracking. Subsequent questions, which varied in accordance with previous answers, always included topics related to perceptions of fracking risks and benefits, perceptions of regulations and state agencies, interpretation of lawsuits and legal outcomes, and means by which participants got information about fracking.

Of the 40 interviewees who were recorded, 28 interviewees were asked directly how they felt about the legal system as an avenue for compensation in the event of fracking-related harm, either for themselves or others. 6 interviewees were not asked that question, as they had already pursued legal action for injuries that they believed to have been caused by fracking activities. The remaining 6 recorded interviewees expressed their feelings about the legal system without having to be asked directly.

At the conclusion of interviewing, the recordings were transcribed verbatim, and each participant was assigned a unique identification number for use on the transcripts.

In cases where an interview consisted of more than one participant, letters were appended to the identification numbers to denote different speakers. These numbers are used for citation purposes below. The interview transcripts were imported into NVivo, a qualitative data management platform, for coding and analysis. Prior to interviewing, initial codes were developed based on an extensive review of risk perception literature, but also included topics related to information sources, lawsuits, settlements, and a variety of other legal concepts. Additional codes were then developed during the course of interviewing as new themes began to emerge. Those themes, in turn, informed subsequent theoretical sampling efforts, and facilitated the continued emergence of additional themes (Timonen et al., 2018). Once the transcripts were imported in NVivo, the researcher coded the entire data set, line-by-line (Charmaz and Belgrave, 2007), creating new codes as they emerged from the data. During the course of coding, all codes were ultimately grouped into concepts, categories, and themes.

Although most interviewees directly stated whether or not they considered themselves at risk of some kind of fracking-related harm, for interviews in which no such direct statement was made, the researcher was able to infer whether interviewees considered themselves personally at risk based on their responses to other questions.

It is necessary at the outset to clarify a few terms that are used frequently. Discussions of claims and lawsuits usually refer to allegations of water contamination, as that is the basis of many such claims, and is an issue of which most interviewees were

very aware. The term “claimant” is meant to refer to anyone who seeks redress for an alleged fracking-related injury, which includes individuals who seek compensation directly from gas companies, wholly apart from the legal system. “Outcome” and “legal outcome” refer to the ultimate resolution of such a claim, whether by settlement outside of the legal system, or a settlement or verdict pursuant to a filed lawsuit. These terms are used broadly here, as they reflect the range of understandings expressed by interviewees. It was important that interviewees framed their understandings of final resolutions in their own terms, rather than imposing any restrictions of legal terminology. Finally, although interviewees expressed concerns about a number of fracking risks, the study focused largely on the contamination of water wells.

6.5 Attention to fracking-related litigation

Given the prolonged nature of litigation, and the fact that very few lawsuits result in a verdict, there is often little to catch the attention of the media or the general public. Therefore, it is not surprising that even those interviewees who made an effort to keep apprised of fracking-related litigation struggled to find much information that they considered relevant. But because many of the interviewees nevertheless expressed strong feelings about whether the legal system would yield a just outcome in the event of fracking-related injury, it was important to establish the extent to which they paid attention to lawsuits of this nature. When asked whether they made any effort to follow lawsuits, many interviewees responded that they did not (*e.g.* 5_1143; 1852; 6_1450; 1932;

1437-A/B). "I have not looked at those, no. I don't -- unless it's on the news or on the radio, I don't look at that kind of stuff. I don't have time to sit down and read through --" (1321).

What awareness interviewees did have about lawsuits was based on stories they happened to see on the news or read in the newspaper. As a result, what they knew about fracking-related litigation was predicated largely on media coverage, usually by local news outlets (*e.g.* 0901; 1211; 1005; 1003-A/B). Other interviewees, however, claimed that lawsuits were not consistently covered by the media, at least relative to other fracking-related issues, and expressed only having a vague awareness that some landowners had sought legal redress through the court system (*e.g.* 1852; 1902-A; 1402-A/B/C).

Even those interviewees who were actively involved in opposing fracking operations, and who paid very close attention to issues arising from those operations, nevertheless tended not to track water contamination lawsuits closely: "you'd have to spend a lot of time and go to a lot of courthouses. I mean there's not a central location for all this." (5_1143)

Several interviewees did claim to follow fracking-related litigation more closely, however (0_1101; 1701; 1212; 1005; 1101). But relevant information is not always readily available: "[y]ou really can't. They sign on -- that's one of the big problems -- is they

force people, in order to be able to live their life, to sign these nondisclosure agreements.” (0_1101)

Although most interviewees said that they did not pay close attention to fracking-related lawsuits, many nevertheless had opinions about the likelihood of obtaining a satisfactory outcome were they to bring such a lawsuit. To shed light on how they formed those opinions, the following subsections analyze interviewee responses reflecting the following: (1) variations in perceived risk; (2) expectations regarding what legal outcomes should be for fracking-related claims; (3) perceptions of actual legal outcomes; (4) interpretations of why actual outcomes do not align with expectations; and (5) the perceived likelihood of obtaining a satisfactory outcome were they to bring a fracking-related lawsuit.

6.6 Perceived risks from fracking

Predictably, interviewees varied in how much risk they perceived fracking activities to pose. Some considered there to be little risk to either human health or the environment; others thought that the environment was at risk, even if they were not at risk themselves; while still others considered fracking a direct risk to their health and property. Interviewees who considered the risks to themselves or the environment to be high tended to express those concerns very clearly.

Then I started to learn about the process and as soon as I heard that “okay well they’re sticking dynamite underground and blowing it up” and you know, to me, I was like, “well I don’t like that, that doesn’t make any sense to me, that doesn’t sound good.” (1320)

Those interviewees who did not consider fracking to pose any significant risk were similarly clear: “if they called me tomorrow, and said ‘hey I wanna drill on you,’ -- pound a hole right now, go ahead. Clear it off. You know, I’m not afraid of it.” (1321) But the interviewees who harbored few concerns about fracking risks tended not to provide extensive answers to questions about fracking-related litigation, other than to express cynicism about contamination claims, and assert that the gas companies would be legally obliged to compensate for any accidents that might occur. As a consequence, they expressed comparatively few opinions about the legal system or its fairness.

On the other hand, individuals who perceived the risks to be high ultimately offered much more detailed perspectives on litigation and the legal system. For this reason, the majority of the analysis going forward focuses on individuals who perceive these risks to be high. Because they consider themselves to be at risk of the types of injuries contemplated by the tort system, their perspectives yield particularly valuable insights.

6.7 Expectations regarding what legal outcomes should be

Those interviewees who perceived the risks from fracking to be very high tended to expect that someone claiming that her water has been contaminated by nearby operations is not only factually correct in that assertion, but should be sufficiently compensated as a result. For them, there can be little doubt where blame should fall for a contaminated water well. “But if you’ve lived in a place for 15, 20 years, you never

had problem -- then the fracking comes in and all of a sudden you have a problem, I think it's pretty obvious." (0_1101) This sentiment was echoed by others who considered fracking to be a significant risk to nearby water wells (*e.g.* 1401; 1519; 1902-A; 1450-B; 1611; 1701; 1102). That anyone could interpret this chain of events any differently struck them as absurd. Even a staunchly pro-fracking interviewee felt that when something goes wrong, the blame can only fall on the gas company:

instead of ... coming, taking responsibility to do anything about it, they were dropping ... water for all of them to use. What's that tell you? That my water must be bad! If you're dropping fresh water off so I can drink it, and it was fine before, and now it's polluted, and nothing else has changed, again, why would they want to fight it? ... Why would the company want to fight it? I mean, it's as plain as your face. (1401)

Although he very much favored continued fracking in the region, he was equally adamant that when companies and contractors do not behave responsibly, they run the risk of injuries for which they should be liable. His view on this point is in line with a traditional perspective on tort claims, negligence in particular.

However, those interviewees who perceived the risks as either very low or non-existent uniformly characterized water contamination lawsuits as opportunistic attempts by landowners to make money by blaming gas companies for water wells that had always contained methane (1321; 1212; one unrecorded interviewee). For example, one such interviewee declared that: "the methane's been there the whole time. They just -- now they can blame it on somebody. Now they can say 'hey, it's your fault.'" (1321) To hear that these lawsuits were being dismissed aligned with expectations, as interviewees

those who considered fracking to be safe also considered any such lawsuits to be meritless (1212).

6.8 Perceptions of actual legal outcomes

6.8.1 Perceptions of lawsuits

Those who perceived the risks from fracking to be high consistently interpreted attempts to redress fracking-related injuries via litigation as being ultimately unsuccessful (*e.g.* 1320; 8_1317-A; 1556; 1143; 1519; 1932-A/B; 1101; 1701).

No, no. Not at all. There aren't any wins, I mean. Look what happened in Dimock. They won and then it got overturned. So that's one of the worst cases in the state. Same thing happened with the [gas company] in Connoquenessing township -- they got like \$11,000. That doesn't even cover the cost of the water replacement that they've had to do. Forget the attorneys' fees. So it's impossible. I think the only way to challenge it is through zoning. (1320)

Interviewees expressed awareness that some landowners were having issues with their water, but they did not appear to be hearing about gas companies having to compensate landowners as a result of those incidents (*e.g.* 1519; 6-1450; 1902-A; 1852; 1402-A/B/C).

"I'd love to think that [courts] would do it. I would love to see that. I don't think I've seen big things happen that way." (8_1317-A) Frequently hearing about harm, but rarely hearing about compensation, may reinforce perceptions that landowners are not getting fairly compensated for their injuries.

Likewise, two interviewees stated that even if claimants were able to get favorable verdicts, the damage awards would not be sufficient to encourage better safety or environmental performance from gas companies (1401, 1450).

I mean these gas companies, they have so much money, you know what I mean? You have to make a judgment that really, really hurts. Otherwise, they'll just say okay, well we lost, the landowner spent \$100,000 in attorneys' fees to win the case, okay? They might get \$150,000, maybe if they're lucky. ... that's got to be a tremendous, tremendous amount of money penalized because that would do it. That's the only thing that's gonna do it. (1401)

6.8.2 Perceived adequacy of fracking-related settlements

Interviewees acknowledged that settlements were very common in this context, both for formal and informal claims (*e.g.* 1519; 6_1450; 8_1317-A; 1005; 1402-A/B/C; 0_1101; 1420). Although public policy favors settlement of claims as a means of resolving disputes faster, more efficiently, and at lower cost to the taxpayers (Alagood, 2015), interviewees seemed to consider fracking-related settlements to be bad outcomes because they did not perceive them as adequately compensating the injured parties. For example, one particularly salient settlement, the terms of which became public just a month before the interviews took place,¹ involved nine families living in a trailer park where the water became contaminated:

¹ Pittsburgh Post-Gazette, *available at* <https://www.post-gazette.com/business/powersource/2018/07/10/Woodlands-residents-Rex-Energy-settle-water-well-claims-shale-drilling-fracking/stories/201807100036>.

there was just a big settlement -- no there was just a *small* settlement compared to the damage that's been done to them ... It's been seven years that they have been without water. Their water is so bad that they can't bathe in it. They can't wash dishes in it. They can't do anything with it. Every drop that they have to live has to be brought in from someplace else. And this group of people got a settlement that came to something like \$160,000. (1701)

Several interviewees felt that fracking-related settlements were, by their very nature, woefully inadequate when compared to the injuries sustained, but that landowners in this situation are economically coerced into signing (e.g. 1519; 1701): "they have no choice! They have to try to get back some life, you know. ... You can't blame them for doing it; they have to -- they have to live, you know?" (0_1101) Others, however, felt as though the courts were compelling parties to settle, which they appeared to interpret as unfairly keeping claimants from being able to seek full restitution at trial.

Interviewee_1402-B: It ain't going anywhere. They're forcing them to settle out of court. That's what's happening. That's basically what's happening. Now--

Interviewee_1402-C: They're forcing them to settle, but they want a settlement because they don't want the --

Interviewee_1402-A: They don't want the publicity.

Interviewee_1402-B: That's what it is!

These interviewees are referencing the fact that settlements in this context almost invariably involve nondisclosure agreements ("NDAs") that prevent the claimants from ever discussing the details of the incident, or sometimes anything related to fracking in

general.² Although the gas companies view the inclusion of NDAs as common practice, and nothing particularly burdensome or unusual, many residents consider them to be serious concessions in a settlement. One resident claimed that after his water was contaminated, he elected not to file suit for that reason:

it'll get to a point where they may come back, and maybe give me a little bit of settlement. But then those settlements usually come with a gag order, and so I would rather be able to go out and to freely speak about this, than to not. (1102)

These comments are representative of the feelings of many interviewees, who almost uniformly considered having to sign an NDA in order to get any kind of financial compensation as significantly diminishing the value of the settlement (*e.g.* 1104; 8_1317-A; 1852; two unrecorded interviewees). Likewise, nearly all interviewees who spoke about NDAs felt that their systematic inclusion as part of settlement agreements was unfair both to the claimant and the community as a whole.

I feel like it's wrong -- it gives gas companies an out. It shuts people up and then they can just keep doing what they're doing. And the story never gets out. So more people are going to be harmed because of the people who have been harmed not being able to tell their story. (1014)

6.8.3 Challenges in quantifying harm done to property

In addition to impressions of unfavorable settlements, another reason that interviewees felt that landowners were not getting adequately compensated may stem

² These restrictions were made famous by the *Hallowich* case, in which the gas company tried to enforce such an NDA against the claimants' minor children.

from the feeling that damaged property cannot be fully restored, and therefore the landowners cannot be made whole. Inasmuch as courts may sometimes be tasked with quantifying the value of non-pecuniary harms, such as pain and suffering, disfigurement, and even human life, in order calculate legal damages, parties who have been injured are not likely to find those calculations satisfying. When asked about what it would take to compensate him if the water on his property were contaminated, one interviewee simply replied: "I honestly couldn't put a value on it." (1701)

Although some interviewees seemed to approach the notions of compensation and being made whole as economic abstraction, many also tended to conceive of it somewhat literally (1437-A). "I mean, how you can you ever -- what amount of money makes water good again?" (1852) On the other hand, he might simply be acknowledging that once the aquifer is contaminated, the property becomes uninhabitable. Although courts may be able to determine a fair monetary value for a given piece of land, for many people property has an emotional value that cannot be compensated for economically: "it might enable you to leave and go somewhere else. But I don't want to go somewhere else. This is my home, this is where I grew up. It wouldn't help -- it wouldn't change anything." (1450-B)

Because the legal system is, or course, incapable of literally restoring plaintiffs to their pre-injury state, some method of quantifying harm is necessary. But the threat to residential properties posed by fracking has created a situation where the harm can have

a significant emotional component that makes some claimants unlikely to be satisfied with economic restitution. Failing to consider the emotional component of the harm landowners suffer can undermine settlement efforts.

No, they've killed my animals. They've killed my horse, they've killed my cows, my chickens, my dogs. And they've screwed up my health. They don't have enough money in the world. They don't have enough money in the world. For 11 years I have dealt with this. And for 11 years, the door keeps getting slammed in your face, slammed in your face, slammed in your face. But I don't know, I might have 11 more years -- I'm going to keep on going. (1104)

Several interviewees had only recently bought their properties in the area, unaware that fracking activities would soon be occurring nearby (1902-A/B; 1233; 1320; 1450-A/B). Of those who were asked whether they would have purchased their property, even at a significant discount, knowing what they did now, all of them declared that they would not (1902-A/B, 1932-A/B, 1450-A/B). "Oh my gosh, you know what, if seriously if I had known we wouldn't have bought it, no matter how badly we wanted this property. If I had known there was a gas well that close, we would not have bought it. I mean it's scary." (1233) That these interviewees all stated that they would not have bought their properties, even at a significant discount to offset their discomfort, demonstrates the difficulty in attempting to quantify the harms suffered. It also offers some explanation as to why many interviewees had negative impressions of settlements and other legal outcomes.

6.8.4 Interpreting verdicts as risk signals

But even significant jury awards in favor of plaintiffs might not be enough to change the overall negative perceptions of legal outcomes. Interviewees were asked how they would feel if they were to hear about someone in their community winning a multi-million dollar judgment as a result of a water contamination claim (e.g. 1701, 1852, 1320, 1556, 1902-A/B). Those who were the most concerned about fracking risks did not consider such an outcome to be particularly meaningful (1556). “No. Because one win out of the hundreds of people that I know who’ve gone to court and got shafted --” (1320). Another interviewee focused on the implications of such a verdict for his family, because if a court were to determine that fracking operations in their community had contaminated a neighbor’s water, it would suggest that they, too, would be at risk. “Better on one hand. On the other, our well is probably polluted now too, right?” (1902-A)

Yet when another interviewee was asked about a court hypothetically dismissing such a lawsuit as being without merit, he did not correspondingly interpret it as a signal that fracking was safe. Instead, it seemed such a dismissal would only compound his concerns.

Well it makes me feel bad because I don’t want my water polluted. I think that’s a bad thing. I have to depend on the aquifer to supply my house and my family, and if it gets polluted I gotta get water buffalo or I got to get water delivered here. And I don’t need to do that, and I can’t afford to do that. (1211)

Rather than revising his perception about fracking's safety as a result of the hypothetical determination, it instead signaled to him that he would have no legal recourse if his well were contaminated. It did nothing to convince him that fracking was any safer than he had previously believed, which suggests that some individuals interpret legal outcomes as either confirming their concerns about fracking or their concerns about the fairness of the legal system.

Tellingly, two interviewees were actually quite aware of their tendency to perceive outcomes based on their own expectations.

I think we've seen -- look, the bias comes out there. When there's a court decision that we agree with, we say, "Well that problem is okay," and when there's one we don't agree with, we say, "well, they probably are in the pocket of the gas company." I'd like to not have to feel that way, but I do. (1701)

Interviewee 1852: If the courts said that this was caused by gas extraction, I guess I'd feel a little bit better. But again, I'm a skeptic because I would want to see it hold up over time.

Interviewer: Does it make you feel better in the sense that it validates your opinion on it, or that the court is seeing it a certain way and will start to --

Interviewee 1852: I guess you're right. Probably yes, it validates my opinion, which I guess is not what the courts are there for, right? They're there for -- to find justice, truth.

6.9 Why legal outcomes do not align with expectations

Interviewees attributed what they perceived as unsatisfactory outcomes obtained by claimants to a variety of causes, each of which underscores a consistent theme that the legal system is unfair to landowners seeking compensation for fracking-related

injuries. One belief was that judges were biased in favor of the gas companies (1320, 1402-B, 1437-B, 1104, 1556, 1233). “You’re not going to have judges around here who are necessarily standing up against the wishes of the gas company.” (1902-A)

Alongside judicial bias, other interviewees felt as though injured landowners were not getting fairly compensated due to the difficulty in finding or affording competent attorneys to take on these types of cases. (1611, 1556, 1317, 1101, 1852, 1402-B, 1233) “If we filed suit with anybody or against anybody, I would think that we would have to pursue legal representation outside of the area. Because anybody else that – a lot of the attorneys, it seems like, are kind of already connected.” (1932-A)

These are not idle speculations, as other interviewees spoke of having had a difficult time finding lawyers to represent them in suits against gas companies (1233, 1317). One interviewee, when asked why he had not pursued legal action to redress his water contamination claims, pulled out four letters from different attorneys declining to represent him (1317). Another who tried to pursue a claim had similar difficulty: “I couldn’t really even find anyone interested in taking my case. As soon as you say it’s a gas well, nobody wants to take it.” (1233)

One interviewee opined that attorneys may be reticent to represent landowners in lawsuits against gas companies simply because it would not be financially beneficial. Other interviewees echoed this sentiment, and felt that bringing a tort suit is ultimately a financial loss, no matter the outcome (e.g. 1143, 1519, 1852, 1320, 1003-B). One

interviewee, who had actually filed suit against a gas company, provided his perspective on the economic realities of litigation:

Okay, so if you do get somebody that works on a contingency basis, it's 40%. Okay, so you take 40%. First of all, medical is out of the question. Trying to prove medical, this is still too new. Ain't happening. Ain't happening. My opinion. So, you go nuisance – you know what your tax bracket is on nuisance? You pay 35%. So if you sue for \$100,000, you're getting a lawyer 40 and 35 for the feds. You end up with \$25,000, and then in the end they want to sign everything away, all your rights for any kind of medical – it ain't happening. In nuisance, it's small money. It might sound good, say you're getting \$100,000, but you ain't getting 100, you're gonna get 25. So how's it even helping you? (1402-B)

Despite his pessimism, he continued to pursue a lawsuit only to get what happened to him on public record. Financial compensation, he said, was not his motivation. Another related concern is that even those who are able to win at trial will be financially unable to sustain litigation through the appeals process. “But what happens is the gas industry's classic M.O. is to just drain the finances of the people in the legal battle until they just can't afford another appeal. And they give up. That's the M.O. That's what often happens.” (1143)

Along similar lines, many interviewees felt as though the financial resources of gas companies gave them an inherent advantage in litigation (*e.g.* 1143, 8_1317-A, 1401, 1211). A common belief was that gas companies could afford “millions of dollars' worth of lawyers” (1519), which implied better representation. That expectation extended to the hiring of more and better experts as well: “it's very difficult for little folks to fight against big companies and big folks because they have access to great attorneys and all

sorts of experts and things like that.” (8_1317-A) This perception of expert witnesses as hired guns, rather than objective scientific voices, has the potential to diminish public perception of the legitimacy of courts’ ability to discern scientific truth (Robertson, 2010). Rather than aiding the finder of fact reach the correct conclusion, experts are perceived as simply another advantage of the side with greater financial resources.

Although how well interviewees understood the nuances of tort law varied, several were aware that a claimant would need to prove causation, and that doing so in toxic tort cases is exceedingly difficult (*e.g.*, 1406, 1143, 1519, 1902-A, 1450). “And, it’s just a very difficult thing to prove. You know, because we’re dealing with scientific and expert analysis, etcetera, etcetera. And I think the deck is stacked against the individual.” (1102) One interviewee articulated her belief that the disconnect between common sense notions of causality and the causal requirements of a toxic tort case is just a legal technicality that prevents meritorious claims from prevailing:

and the legal way of thinking was since the water hadn’t been tested before, there was no proof it was because of the oil companies. The chemicals obviously didn’t come from anywhere else. These people lived there for a long time and never gotten sick, so it was ridiculous. It was just one of those legal loophole things. (1014)

6.10 Perceived likelihood of obtaining a satisfactory outcome from bringing a fracking-related claim

Those who perceived the risks from fracking to be high also tended to consider it unlikely that they would obtain a favorable outcome if they were to bring a fracking-related claim. On the other hand, those who were less concerned about fracking risks

were much more optimistic about obtaining favorable outcomes in the event of harm. For example, one interviewee, who was decidedly pro-fracking, and who considered water contamination claims to be little more than cynical opportunism on the part of some landowners, had no doubts that he would be compensated for any harm:

if somebody did contaminate your well or if they did, you have that in your clause. You have that written in your legal agreement where it says, "if your well gets contaminated after we start, we will take care of it." And that's gonna be, the lawyer's gonna take care of that. (1321)

Another pro-fracking interviewee, who considered fracking risky enough to merit careful regulation, but did not appear to consider himself to be at risk personally, offered a confident, but conditional, response to the question of compensation via the legal system. "Yes. Not in a timely fashion." (1401) He did note, however, that most landowners were not in a position to be able to afford prolonged litigation with a gas company that has significant resources.

Along similar lines, interviews were conducted with two individuals who had concluded that scientific research had sufficiently demonstrated fracking to be a risk to water, but did not live in areas that were currently thought to be suitable for wells. One of them, however, owned undeveloped property that he did lease to a gas company. He expressed confidence that he would get a favorable outcome were he to sue if that property's water were contaminated:

I wouldn't hesitate, and being a scientist, I would have the evidence. I would have evidence, I wouldn't just say this is my suspicion, I would have evidence for it. ... If you have the prior evidence of there not being a

problem. If you have the original water sample test, and certainly I have had those -- (1357)

The other, however, expressed concern about the safety of his water, despite explaining that there were currently no gas wells close to his home. Although he was a less confident about getting a satisfactory outcome -- "[b]ut how are you ever gonna make it whole?" (0901) -- he still considered the legal system capable of reaching the correct conclusion:

I would tend to believe the courts, yes, because you have to believe in something. And there has to be some bottom line, and how else can I make a judgment than to do that? So yes, I would tend to believe the courts that when they got done -- as long as they got some scientific basis on doing it and not just legal procedure -- "Oh you didn't fill this form out right," you know, which you get too. So yeah, I would tend to believe the courts, I guess. (0901)

But for those who perceived fracking to pose a high risk, particularly to themselves and their families, there was less optimism about getting a favorable outcome by engaging with the legal system (24 interviewees). "So in my opinion, trying to go the environmental contamination route -- they're never gonna win." (1320)

6.11 Proposed theory: the relationship between risk perception and perceived fairness of the legal system

Careful analysis of the interviews collected for this study strongly suggests that how individuals perceive the likelihood of obtaining a satisfactory outcome through the legal system in the event of a fracking-related injury negatively correlates with their perceptions of the risks posed by fracking. Furthermore, it is likely that this result is

driven by interpretations of outcomes experienced by claimants who have alleged such harm, and what those experiences imply about the fairness of the legal system (figure 5).

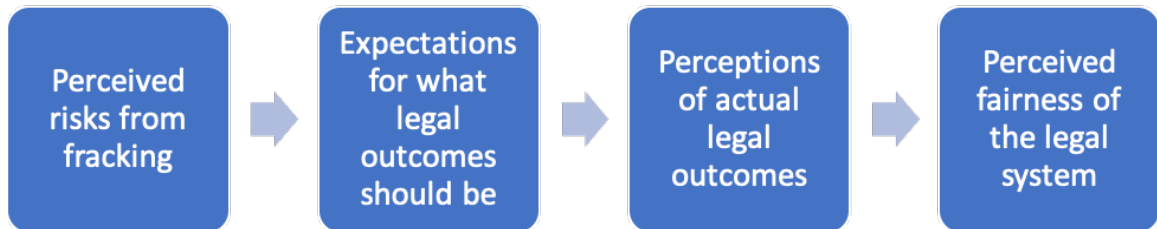


Figure 5: Influence of risk perception on perceived fairness

This theory is predicated on a clash between expectations regarding what the outcome certain claims *should* be, and perceptions of what the outcomes of these claims actually have been. For individuals to be personally concerned about fracking risks, they must necessarily believe that fracking can and does cause the harms associated with it. Thus, when a landowner alleges that her water well became contaminated after nearby fracking operations commenced, those who perceive fracking to be dangerous will have little reason to doubt that fracking caused that contamination, based on a commonsense notion of causality: (1) the well was fine; (2) fracking occurred nearby; and (3) hazardous chemicals have subsequently appeared in the well. They then expect that the person making the claim should be fully compensated for the harm done. But if the actual outcome does not meet that expectation, they conclude that the system governing the outcome is unfair.

The researcher did not set out to prove the proposed theory. This study was designed as an exploratory study to examine how people perceive the legal system as a

means of compensation in the event of a fracking-related injury. The proposed theory arose after analysis of the data suggested that there might be a relationship between risk perception and perceived likelihood of a positive legal outcome. Although this is not a quantitative study, nor does it intend to measure or prove a causal relationship, Table 1 lends support to the proposed theory by breaking down the 40 recorded interviewee responses in terms of whether they considered themselves personally at risk from fracking activities – whether directly expressed or inferred by the researcher – and whether they had a positive or negative view of the legal system’s likelihood of yielding a satisfactory outcome. Six interviewees had already pursued legal action, and were therefore not included.

Table 1: Interviewee risk perception and views of legal outcomes

	Positive view of legal outcomes	Negative view of legal outcomes	Unclear/inconsistent view of legal outcomes
At risk personally	0	24	2
Not at risk personally	3	3	2

6.12 Legal outcomes and fracking strategy

Although these findings appear to be at odds with the procedural justice literature, they align well with the emerging situated justice literature. Situated justice takes into account “the institutions and structural advantages and disadvantages” encountered by litigants, something evident in the findings of this study (Berrey et al., 2012 at 3). For example, both here and in the study conducted by Berrey et al.,

interviewees expressed frustration related the difficulty procuring competent legal representation, and the financial and emotional toll of litigation. But what distinguishes the present study is how the interviewees interpret legal outcomes as part of a larger narrative about fracking safety. Fracking's potential to harm human health and the environment remains fiercely contested, and it does not appear as though interviewees interpret claims as one-off, fact-specific inquiries subject to factfinder scrutiny, but rather see them as referendums on whether the legal system responds to those claims in a manner that aligns with how they believe or expect that it should.

It is important to keep in mind that these individuals are approaching questions raised in the interviews with the utmost certainty that fracking has, in fact, caused this type of harm to any number of people. Thus, they were not approaching them with the kind of detachment one might expect from asking this kind of question in a lab or as a hypothetical. They sincerely feel that the legal system has failed to compensate landowners for the very types of injury that the system is in place to address. Even to the extent that these responses reflect some measure of realistic awareness of the uncertainties of litigation, a lack of faith in the legal system to justly compensate injured parties is evident.

However, a number of factors combine in this situation that are unique to fracking, and may not apply outside of this context. First, the claims at issue here implicate the larger question of a particular activity's potential to cause harm, something

not always the case in the toxic tort context. Here, the kinds of harms being alleged from lawsuit to lawsuit are very similar, and usually arise from contamination of private water wells. Although specific facts certainly vary, the claims are analogous. But unlike some other toxic tort claims, the alleged harms are not caused, for example, by a single chemical or a particular facility. Here, similar claims are alleged against different companies, in different parts of the state, and implicating different gas wells. This reinforces the notion, at least for some, that these lawsuits implicate the larger issue of fracking safety, rather than a single, fact-specific claim arising from a unique set of circumstances. Second, settlements invariably include nondisclosure agreements, which make it impossible to accurately gauge the number of people who have made these and similar allegations. Not hearing about favorable outcomes, regardless of the reason, is interpreted negatively because residents hear about alleged incidents, but not necessarily about any subsequent compensation or resolution. Third, and relatedly, there was, and still is, an aggressive media campaign by the gas industry touting the safety of fracking. When combined with a relatively underdeveloped scientific body of research examining direct links between fracking to contaminated wells, the result is an atmosphere of controversy and confusion, in which the safety of these operations is fiercely debated, and residents look for confirmation of their risk perceptions.

Thus, for those who consider fracking to be a serious threat to human health and the environment, the inability of claimants to get just compensation for their injuries is

evidence of the legal system failing to acknowledge the reality that they, and many others, are at serious risk. Rather than being a situation of two opposing perspectives of the facts in a slip-and-fall case, for example, some residents may view each fracking claim as raising the question of whether fracking is actively contaminating water wells, or even whether it has the potential to do so. So, for those who are certain that these operations *are* contaminating water wells, something that has severe consequences for landowners, it is difficult to reconcile that certainty with a perceived failure of the legal system to come to the same conclusion, and ensure adequate compensation is paid.

6.13 Faith in the legal system

Interviewees' explanations for why the legal system is failing to compensate injured parties tend to fall into two categories: judicial bias and systematic disadvantages. Several interviewees insinuated or outright expressed a belief that judges in the area were biased in favor of the gas industry, and that this bias accounted for claimants' difficulties in obtaining fair compensation. Many others cited structural disadvantages, such as access to financial resources, access to competent attorneys, and difficulties proving causation, as the reasons for a perceived lack of claimant success. Claimants' struggles to prove causation in the toxic tort context have been well documented (*See Klein, 2008*). Whether any of these factors are, in fact, yielding unjust outcomes in the fracking context is outside the scope of this paper. But as a result of perceiving such disadvantages, many interviewees expressed little faith that the legal

system has been handling the claims of landowners fairly. Likewise, they feel that it would not treat them fairly should they file suit in the future.

This diminished faith can be summarized in one interviewee's reaction to a hypothetical question about plaintiffs winning significant verdicts.³ When pressed about how she would feel if such positive verdicts became consistent, she responded: "[i]f they were winning more consistently, we'd be getting changes in regulations, and this wouldn't be happening." (1320) Her response implies that if legal outcomes reflected the realities of fracking's harmfulness, it would trigger the legislative action necessary to reduce those harms. In a sense, she is suggesting that the failure of the courts to acknowledge and respond to these harms is allowing fracking activities to proceed unchecked, and additional parties to be injured. It underscores a general sense that the institutions in place to protect people from harm, and to compensate them in the event of harm, are failing to do either. But it also suggests that risk perception influences how outcomes are interpreted, such that even a favorable outcome would not be looked upon very favorably unless it led to a reduction in the risks as perceived.

³ As noted above, when asked how they would feel if they were to hear about such a verdict, several responded negatively. Instead of interpreting those outcomes as evidence that the legal system is working as intended, they dismissed them as outliers that were not representative of the experiences of other claimants.

6.14 Between procedural justice and situated justice

Based on in-depth interviewing of affected individuals, this study proposes a theory that risk perception may play a role in how they perceive the fairness of legal outcomes arising out of fracking-related claims. Those interviewees who felt personally at risk demonstrated a diminished faith in the legal system to deliver just compensation were they to be harmed by fracking operations, and questioned whether they would bother pursuing a legal claim in that event.

This pessimism reinforces what Berrey et al. (2012) reported about plaintiffs' disappointment after having their hopes of vindication dashed during the course of employment discrimination litigation. But what distinguishes the present study is that the disenchantment expressed by interviewees came without their having gone through the litigation process. In that sense, this study bridges the gap between the procedural justice literature, which has largely relied on studies conducted in lab settings that are divorced from the realities of litigation, and the situated justice literature, which examines how actual litigants feel *after* having gone through the process. By examining the attitudes of individuals who have not engaged with the legal system, but who believe that they are very much at risk for the kinds of injuries the tort system is meant to address, the present study provides unique insight into the factors that shape perceptions of the legal system.

The first insight is that risk perception, under certain conditions, may play a role in how individuals perceive the legal outcomes of others. Those most concerned about fracking's potential to harm them or their families felt that those who have brought fracking-related claims were not justly compensated by the legal system. In contrast, those interviewees who did not consider fracking to pose any threat whatsoever saw no such injustice. They interpreted the dismissal of fracking-related claims as owing to a lack of evidence, as they did not believe fracking was capable of causing such harms. Finally, those interviewees who believed that fracking was at least capable of contaminating nearby water wells, but who did not themselves feel at risk, expressed confidence that they would get just compensation were they to bring a claim.

That risk perception may influence interpretation of legal outcomes leads to the second important insight of the study: perceived fairness is informed by expectations about what outcome *should* obtain. It is reasonable to assume that most individuals enter into litigation with the expectation of vindication, and that any outcome to the contrary will inspire disappointment, and perhaps a sense of unfairness. But because this study examined the perspectives of those who had not (yet) litigated, the fact that they are so pessimistic about the fairness of the legal system should be concerning, particularly because many of these interviewees consider themselves at risk of the very harms the tort system is intended to address. That they could be so certain that the facts

and the law would support their position, yet would still consider litigation to be fruitless, sheds some light on the inherent asymmetries in the legal system.

But as noted above, there are a number of factors that combine to make the fracking context unique, both in terms of the development of risk perceptions, and the interpretation of legal outcomes. That unique combination may limit the generalizability of the findings reported here, at least in terms of seeing analogous findings in other legal contexts. Likewise, because this study was exploratory, the insights identified arose only after interview transcripts were carefully analyzed. However, this provides ample room for future research to seek additional insight into the issues raised here. For example, do those who consider the legal system unfair to fracking claimants see similar unfairness in other contexts, and if so, why? Is there a difference between how pro-fracking and anti-fracking individuals perceive the fairness of the legal system, generally?

How individuals in different contexts perceive legal outcomes is a fertile area for future research, and in-depth interviewing can help develop a deeper understanding of how those perceptions are formed, and how they diverge from assumptions that underpin the litigation process. Trusting that the legal system will yield a fair outcome is crucial to those considering whether to engage with it in the event of injury. Failing to explore and address the inherent asymmetries that litigants face, in the toxic tort context

and elsewhere, threatens to diminish the legitimacy of the legal system in the public's eyes.

7. Conclusion

This study examined how Pennsylvania residents living in communities affected by fracking interpret the risks it poses, the regulations governing it, and the legal system as an avenue for compensation in the event of injury. By focusing on those individuals who see fracking as a threat to themselves, their communities, and the environment, the study yielded a number of insights into the fracking controversy that merit further attention and exploration.

7.1 Key insights

Although interviewees' discussions of their perspectives on fracking safety reflect well established risk perception mechanisms, the uniquely complex nature of the fracking context not only reveals some nuance in how they are manifested, but also highlights the need to guard against the vulnerabilities they create. For example, whether knowingly or not, landmen who touted the tremendous financial windfall that could come from leasing land for a gas well were triggering the affect heuristic, which induced landowners to correspondingly reduce concerns they had about the potential negative consequences of leasing. Much like the availability entrepreneurs described by Kuran and Sunstein (1999), the landmen exploited a mental shortcut for their own gain.

The study also demonstrates that influence of proximity on risk perception is very complicated in the fracking context, and distance alone insufficiently predicts how individuals will perceive the risks posed by a gas well. Three factors, in particular,

cloud the relationship between risk perception and proximity: (1) significant differences in how benefits and harms are distributed, even between residents living in the same township; (2) the manner in which gas wells and other fracking-related facilities are scattered throughout areas and communities; (3) the hilly topography in these regions of Pennsylvania. Taken together, these factors caution against making assumptions regarding risk perception based on geographical proximity.

Although risk perception predictably influences support for or opposition to fracking, this study suggests that it also has ramifications for how residents perceive the fairness of the legal system, and whether they would engage with it in the event of injury. Individuals who sincerely consider themselves at risk for the very types of injury the tort system is in place to address, nevertheless expressed hesitancy to seek legal redress due to perceived unfairness, something that should raise concerns within the legal community. Fairness is the foundation of the legal system, and its legitimacy depends on citizens trusting that it can, and will, yield just results. Whether interviewees' concerns about fairness arise from their own experiences, the experiences of others, or even from a general cynicism about the legal system, the consistency of this perspective among interviewees strongly suggests that the issue be taken seriously.

Along similar lines, this study also demonstrates residents' frustration with the regulations governing fracking operations, and with the state agencies tasked with enforcing them. Allegations of DEP collusion with the industry suggest a serious lack of

trust in the governing institutions in place to protect people from the harms fracking has allegedly caused. Familiarity with fracking regulations varied among interviewees, but there was a consistent desire for increased transparency with regard to the contents of fracking fluid, and how produced water is managed. The insistence for more transparency went beyond fracking fluid, however, and emerged as a central point of contention for interviewees. There was an almost universal desire for more information about safety-related aspects of fracking operations, including the frequency and severity of spills and water contamination claims.

7.2 Recommended steps in the near term

“Access to environmental information is imperative to ensure human health and safety. Environmental harms and hazards are more likely to occur -- and more likely to escape detection for longer -- where there is inadequate access to environmental information.” (Lamdan, 2016, p. 483) Given interviewees’ consistent appeal for more comprehensive and comprehensible information, I conclude that policymakers can make significant strides to alleviate the frustrations of many residents by enacting measures that increase the collection and publication of safety-related information. Implementing the information disclosure measures discussed in Chapter 4 will not significantly burden the gas industry the way increasing well setbacks would, for example. Yet the benefit to residents of providing additional safety information would be significant.

Although communicating risk information to the general public does not ensure that they will use that information in a manner that aligns with expert risk assessment, it does not excuse the failure to provide relevant safety information. The study has demonstrated that for those individuals who are concerned about the risks fracking poses, the lack of information about those risks only exacerbates their concerns. Interviewees did not benefit from overly technical monitoring or exposure reports, but instead expressed a desire for the kind of information a reasonable person in their situation would want, such as how often residents have reported water well contamination, or where spills have occurred.

7.3 Future research

Broadly speaking, this study was designed to examine how individuals living in communities affected by fracking perceived the risks it poses, as well as the regulations in place to govern it, and the legal system as an avenue for compensation. In line with the nature of exploratory research, it yielded unexpected insights, but it also raised questions that can be examined further in future studies. For example, additional research is needed to understand how pro-fracking residents perceive the legal system, not only with regard to fracking lawsuits, but in general. If additional research were to find that they profess confidence that they would win a fracking-related tort suit, but lack such optimism when speaking about other types of lawsuits, that would be significant.

Similarly, because this study largely focused on individuals who perceive the risks posed by fracking to be significant, future research into how pro-fracking residents arrived at conclusions about fracking risks would be insightful. For example, understanding the interplay of cultural cognition and solution aversion with other cognitive mechanisms might provide more insight into how fracking supporters develop perceptions of its risks.

Finally, to complement insights gleaned from interviewing residents living in communities impacted by fracking activities, similarly in-depth research into the perspectives of state legislators could reveal any discrepancies between how residents and policymakers come to perceive fracking risks. Understanding these discrepancies would shed light on how different values are prioritized, and ultimately assist policymakers in crafting policy interventions that would be most beneficial to those constituents who face the risks they purport to mitigate.

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