Fracking Futures: Political-Ecological and Socioeconomic Realities in Southwestern Manitoba's Oil Field

by

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Abstract:

Hydraulic fracturing (fracking) has arrived in southwestern Manitoba enabling oil companies to drill in formally inaccessible and uneconomic areas on the fringes of the Bakken Shale. My study analyzes the regulatory framework, assessment regime, and potential political-ecological and socioeconomic effects of new fracking technologies in Manitoba. I look beyond fracking as a technical exercise, engaging with it as a situated lived experience. Through purposive qualitative interviews with those affected by the industry, immersion in the field and an evaluation of grey literature studies, I describe the attitudes and realities of people living amidst the fracking boom. I ultimately unfold the narrative of fracking in the province to reveal a neoliberal program that I argue puts economic and technical desires above public health and environmental concerns.

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Chapter 1: Fracking in Manitoba: an introduction to local geographies in the Bakken

It has long been an axiom of environmental geography that the human-environment connection coalesces at the intersection of natural resources extraction and the social and economic framework that it supports (Ostrom, 2015; Robbins, 2011). This relationship ties communities affected by resource extraction, often manifesting in environmental, health and economic concerns (Bridge, 2008; Fletcher, 2010). In this thesis, I explore the ways that hydraulic fracturing or the "fracking" for oil in southwestern Manitoba has shaped and continues to shape local communities by influencing the past, present and future lifeways of those living amidst the oil boom. I examine the way the oil industry is governed through legislation and more subtle forms of governmentality to analyse the unique experience of fracking in southwestern Manitoba. My overarching goal is to illuminate gaps and elisions within the common extractivist discourse, or the way we think and, talk about and react to oil in Manitoba, and to explore some alternative narratives of fracking.

Fracking has dramatically shifted the way contemporary fossil fuel extraction is conducted. New technologies combining hydraulic fracturing with horizontal drilling have opened up access to deep underground shale deposits, exponentially increasing the amount of available oil and gas in North America and across the globe (Parfitt, 2011; Prud'Homme, 2014; CCA, OCMOH, 2012; Sica, 2013). Although there are important biophysical and economic component to natural resource extraction, there are also social, political, technical, historical, and environmental forces that intersect and produce what we understand as natural resources. Interwoven amongst these forces is a network of power relations. While the industry refers to hydraulic fracturing as the technical act of high pressure drilling, I propose that the term and

practice of fracking intertwines technical realities with social and political relationships of those living and working amid the oil boom. By obscuring the social components of fossil fuels and framing extraction in predominantly economic and technological terms, extraction proponents and the industry regulators limit the discursive frame through which we can think about extraction. This framework establishes power dynamics, assigning the roles of the beneficiaries of the industry, and establishes to a certain extent where and who are affected by potential negative externalities of extraction. Whether acknowledged or not, human-environment relationships produced alongside fossil fuel economies are complex and ever-shifting social productions.

In this thesis, I conceive of natural resources as hybrid entities, fusions of nature with social relations, and I follow scholars who refuse the ontological separation of the physical and social realms (Braun, 2008; Bridge, 2009; Castree and Braun, 1998; Demeritt, 2002; Willems-Braun, 1997). Resources in this sense are produced within modern capitalism that prioritizes accumulation and the alienation of nature. Matt Huber (2008) has shown how, to ensure environmental processes and social relations do not become barriers to profit, capitalist societies encourage the epistemological separation of people from nature by defining extraction in narrow scientific and technological terms. Neoliberal ideology, broadly understood as the radical marketization and privatization of life, has shaped the way environments and communities have been divided, supporting privatization and commodification of land to ensure access to buried fossil fuels (Bridge, 2010[a]). Concerns over human induced climate change through greenhouse gas emissions, the possibility of having peaked the world's oil supply and increasing violence in oil exporting countries have taken precedence in decision making (Bridge, 2010[a]; Bridge, 2010[b]; Bridge and Wood, 2010; Huber, 2008; Huber, 2011). Instead of taking this as a blow to

capitalism, or a chance to reorient the extractive dimensions of our economies, “Big Oil” companies and neoliberal governments around the world have used the carbon crises as opportunities to invest in tight oil extraction. Global neoliberal forces are combining and interacting with the local economic and geophysical conditions to create the phenomenon that has come to be called the tight oil boom (Mercer et al, 2014).

I am interested in the culture of this technology, and the culture produced both in its regulation and in its aftermath – before and after extraction. This “oil culture” in southwestern Manitoba manifests in the material impacts that fracking has on the physical landscape and in the inescapable connection that humans have with the natural world (Barnett and Worden, 2014). Pollution, public health risks and environmental hazards associated with fracking can be understood as social relations, intersecting between society, environment, industrial development and the embodied nature of experience (Parr, 2006; Willow and Wylie, 2014). Following an analytical framework that focuses on social relations allows me to direct attention to how resource extraction is experienced on multiple scales, bringing prosperity, attention and social and economic dislocations to places that have been considered unattractive or uneconomic to the oil and gas industry in the past. Biophysical and cultural landscapes become defined through the privatization and commodification of land, a frame that prioritizes access to resources, and indeed produces resources as desirable things. In this instance, and as I argue in this thesis, the regulating bodies of the state and the economic interests of the oil industry align as growth becomes the measure of success, feasibility and continuity. Within this growth model, as the magnitude of oil extraction increases, public commons like air, water, soil and community spaces are increasingly at risk and devalued as social and economic commodities.

Fracking in Manitoba

Hydraulic fracturing has been in use in Manitoba for over two decades (Welch, 2013). It may not be a new extraction technology (MB Petroleum Branch, 2015), but the scale at which fracking is occurring in the province is unprecedented. As technology advances, so too does its industrial footprint; the combination of hydraulic fracturing and horizontal drilling has created an engineering marvel that can drill into deeper formations than ever before. This technology has opened up places like southwestern Manitoba to new drilling investment.

Southwestern Manitoba lies over top of the northern section of the Bakken shale formation; a massive light tight oil formation that extends into southeast Saskatchewan and down into North Dakota and Montana. All of these jurisdictions have substantially larger oil economies than Manitoba (Evensen, 2015; Schaeffer, 2014). Fracking has been localized around the town of Virden, the epicenter of the provincial oil economy which extends throughout the southwestern corner of the province. The industry has brought economic opportunities and job growth into rural areas, bringing revitalization to communities largely dependent on uncertain agricultural prospects. Small towns in the areas are experiencing sometimes rapid population growth leading to infrastructural and social issues common to "boomtown" communities (see Braiser et al. 2011; Brown et al. 2005; Parkins and Angell, 2011).

Much of the uncertainty produced in the wake of fracking economies stems from the very fact that environmental and associated health realities of the chemicals and techniques used in fracking are largely unknown, or at least cannot be specified or tied directly to place. The lack of definitive short and long term risks for individuals living amidst the boom is a major source of tension (Cartwright, 2013; CCA, 2014; Coram et al. 2014; Goldstein et al. 2012; McKenzie et al.

2012; OCMOH, 2012). Community members are forced to live amidst the uncertain risks to their bodies and land as scientists and regulators attempt to "catch up" to the oil boom. Very generally, the precautionary principle of scientific endeavours has not been applied effectively in the management of oil and gas futures (Holbrook and Briggle, 2013)

The oil industry in Manitoba is on the rise, as multinational oil corporations begin to move into rural communities like Virden, Cromer, and Melita to compete with local drilling companies in the race to tap into underground wealth. Provincial regulations encourage economic development though they contain little room for public consultation. This regulatory/participatory disconnect, alongside the lack of mainstream media attention creates the conditions for oil activities in the province to remain largely under the radar, despite the fact that it comprises roughly 7% of the provincial economy (MB GET, 2016). Industry and government rely on particular forms of discourse as a means to govern public understanding of oil in a way that facilitates economic success and profit maximization. In this sense, the affect of the oil industry can be seen in multiple ways. I aim to question both the material and discursive affects of oil development.

My research breaks down the administrative and regulatory black box to unpack impacts of new shale oil economies in southwestern Manitoba. I draw on examples from industry and government in Manitoba to explore how these techniques of rule have played out in practice. I turn to political ecology literature to show that people living amidst the oil boom have a much more complicated understanding of fracking than the strictly economic terms used by fossil fuel authorities. I also draw on literature from human geography debates on scale (Marston et al. 2005; Kurtz, 2003; Tsing, 2000), environmental assessment (Diduck and Mitchell, 2003; Cheng et al., 2003; O'Faircheallaigh, 2010; Sinclair et al, 2008;) and extractive economies (Bridge,

2009; Bakker and Bridge, 2006; Huber, 2011) to understand relationships between the provincial government as a regulator and assessor, the industry as profit maximizing proponents and technical experts, community members as employees, watchdogs and neighbours, and the natural environment as the matrix where interconnections between players are acted out. I focus on interviews with policy-makers, technicians, administrators in the Manitoba Petroleum Branch, and stakeholders in and around Virden, the town at the centre of the fracking boom. I engage community members, key stakeholders including oil workers, local environmental groups, the Manitoba Water Caucus, and businesspeople. My research, though based in the very materiality of oil cultures and economies in southwest Manitoba, aims to examine the discourse surrounding oil extraction in Manitoba in politics and ambiguities inherent in the industry, illuminating the epistemological circumstances that fuel the shale oil economy of southwestern Manitoba.

What is Fracking and Why is it Important?

In the 1990s, breakthrough technology in horizontal drilling and multi-stage hydraulic fracturing in the Barnett Shale awakened the tight oil and gas revolutions (Prud'Homme, 2014; CCA, 2014, OCMOH, 2012). Conventional drilling uses vertical wells to access underground reservoirs. Unconventional drilling technology uses vertical boring to reach the desired underground depths, and then the bore is angled to drill horizontally or diagonally to access previously unreachable reservoirs. This has dramatically increased the oil potential of North America (Prud'Homme, 2014). As part of this process, companies inject millions of liters of water and thousands of liters of chemicals and proppant (usually sand) underground at extremely high pressure into each individual well to fracture the underlying shale rock formations. The released underground liquids seep from the rocks and migrate up the well to the surface for collection. The used 'frac-water' (aka 'produced water', 'slick water', brine or salt water) is

brought back to the surface in the process called flowback, though a significant portion (as much as 90% according to Earthworks, 2016) of this water is left underground and encased in the well after the fracking process has been completed. Besides oil and saline water, underground reserves often contain trace amounts of radioactive elements (Boschee, 2014; CCA, 2014, OCMOH, 2012). Once extracted, the oil must be refined and processed into useable forms of hydrocarbons, petrochemicals and oil-based products.

Because much of the operation is underground, the process of horizontal drilling and hydraulic fracturing only account for a component of the visible evidence on the landscape. Each well requires the creation of a road, a well pad, pipeline, disposal facility and proper casing and batteries. Trucks haul in the necessary equipment and water: the average well requires 15 000 to 20 000 cubic meters or 1 000 truck loads of fresh water (Boschee, 2014; CCA, 2014; OCMOH, 2012). Unknown concentrations and combinations of proprietary chemicals, as well as sand, are used in the fracturing process to improve flow, prevent organism growth and to reduce friction (Barati and Liang, 2014). Once the well is no longer active, the site must, in theory, be decommissioned and the land reclaimed.

The process requires the intensive combination of technology, engineering, chemistry, and brute force power to turn raw materials into useable energy. This may be the emblematic "brute force technology" (Josephson, 2002). The ecological footprint of fracking is substantial once the entire lifespan of the technology is taken into consideration. Some of the physical concerns fracking communities face include the extensive damage to roads due to increased heavy truck activity, chemical spills, waste water spills, ground water contamination and depletion, increased seismic activity, methane migration, air pollution and other unknown long-term effects (Ellsworth, 2013; Osbourn et al. 2011; Parfitt, 2011; Prud'Homme, 2014; Wilbur,

2012; Wylie and Albright, 2014). Some of the socio-economic impacts communities face includes dramatic changes to property values, disputes amongst neighbours, financial pressures from contaminated agriculture, disruption of social networks, strains on infrastructure and social services, and increases in criminal or 'deviant' social behaviours (Willow, 2014; Willow and Wylie, 2014). There are countless other ways people have been affected that have not been included in this short list, though they will appear in the analysis that follows. The important point is that the impacts of fracking are multiple: broader than the industry claims, often uncertain in outcome, and potentially long-term in effect.

Local perceptions of fracking are usually characterized by levels of ambiguity. Communities are often excited to welcome new economic opportunities but are concerned about the short and long term impacts. Most people are generally aware of our societal reliance on fossil fuels, and understand the benefits of consuming domestically produced fuel. However, many people also want a say in the terms and conditions of extraction. Alongside the economic benefits are real environmental and social consequences. People experience community life through the intersection of all of their identities. Everyone's experience is unique to that specific time and place. Natural resource development creates new fissures within communities and can deepen already existing marginalization. I offer no singular explanation of fracking; the experience will depend on the position of the observation and the observer.

How the West was Won: A Short History of Oil Exploration in Southwestern Manitoba

The southwestern corner of Manitoba has a long relationship with the oil industry, shaping the economy and working culture of the region. The province has a history of oil development with the first charter of petroleum exploration in Manitoba dating to 1877 (Mineral

Education Series, 1987). In the midst of a developing exploration economy in the Waskada-Melita district, the provincial government passed the first oil and gas legislation in 1947 and in the same year the Brandon Exploration Company was issued the first Oil and Natural Gas Reservation Numbers (Mineral Education Series, 1987). Even in these early years, there were strong international ties between oil companies. Prominent multi-national companies had the capital to fund exploratory endeavours. This investment, in turn, shaped local conditions to favour industry relations. For example, in 1951, the California Standard Oil Company (parent company to the Brandon Exploration Company, and now known as Chevron) drilled the first successful oil well in the province, located fifteen kilometers west of Virden, in the Williston Basin (see Figure 1) (Mineral Education Series, 1987).

Figure 1: Map of the extent of the Williston Basin (Canadian Oil Stocks, 2016)

That same year the Daly Field located in the Virden area was proven viable for exploration, and in 1952 seventy-three successful wells were drilled (Mineral Education Series, 1987).

The introduction of drilling into the province kick-started a small but lucrative oil industry. Around this time, Manitoba's first crude oil pipeline gathering system was installed in the Daly Field. By 1955, a total of 554 wells were producing 658 789 cubic meters of oil (Mineral Education Series, 1987). Oil exploration and production steadily increased in the 1960s. In 1968, oil production peaked at 986 023 cubic meters (Mineral Education Series, 1987). In the 1970s, following Shell Oil Company's declaration of a deep oil find in neighbouring North Dakota, Manitoba's oil patch began attracting interest and investment from larger multinational energy companies. This interest peaked in 1981, with the discovery of the Lower Amaranth Formation at Waskada (Mineral Education Series, 1987).

More robust oil and gas legislation accompanied the increase in drilling, particularly as conflict developed between local stakeholders and the companies operating in their midst. In 1983 the Manitoba Surface Rights Act created a Board to mediate drilling and leasing conflicts between petroleum companies and landowners (MB Petroleum Branch, 2015). The Surface Rights Act created a legal space for landowners to negotiate details about reimbursement, well location and expectations from drilling companies. In the chapter that follows, I address the limitations of this act by pulling apart what it means to be a surface rights versus a mineral rights owner, alongside the built-in power imbalances that put farmers and landowners in a dependent but sometimes adversarial relationship with government and oil and gas companies.

The industrial growth of the early 1980s oil boom was shortlived. This was perhaps inevitable, given the cyclical and "cyclonic" nature of resource development (Keeling and Sandlos, 2009; c.f. Braiser et al. 2011; Brown et al. 2005; Parkins and Angell). Internationally, during the 1970's and early 1980's, OPEC (the Organization of the Petroleum Exporting Countries), an intergovernmental organization of major oil-producing nations, sought to

manipulate oil markets by withholding production, and in the process orchestrated an all-time high price market for oil through unified petroleum pricing and production in member countries. The ebb and flow of oil markets then reached a nadir in 1986, when a major market crash caused oil prices to collapse leading to a massive glut of petroleum products which further exacerbated price decreases and corresponding production complications (OPEC, 2016). This 1986 crash had global repercussions, including in Manitoba's oil patch. The price of oil fell by 46% locally (Mineral Education Series, 1987), grinding the local industry to a virtual standstill. The massive decrease in oil prices meant Manitoba's industry would need time to recuperate from the oil depression.

In spite of the dour economic forecasts in the wake of the OPEC oil crisis, there was promise on the horizon for Manitoba's oil industry. In 1985, it was discovered that the Bakken Formation, more recently heralded as North Dakota's economic saviour and the solution the US's perennial domestic energy crisis, produced oil in the Daly Field in Manitoba (Mineral Education Series, 1987). The Daly Field is located northeastern regions of the Bakken Formation, beneath the town of Virden and surrounding areas (see Figure 2 - "Daly Sinclair"). The formation was so large and accessible that it was deemed economically viable in spite of the low prices.

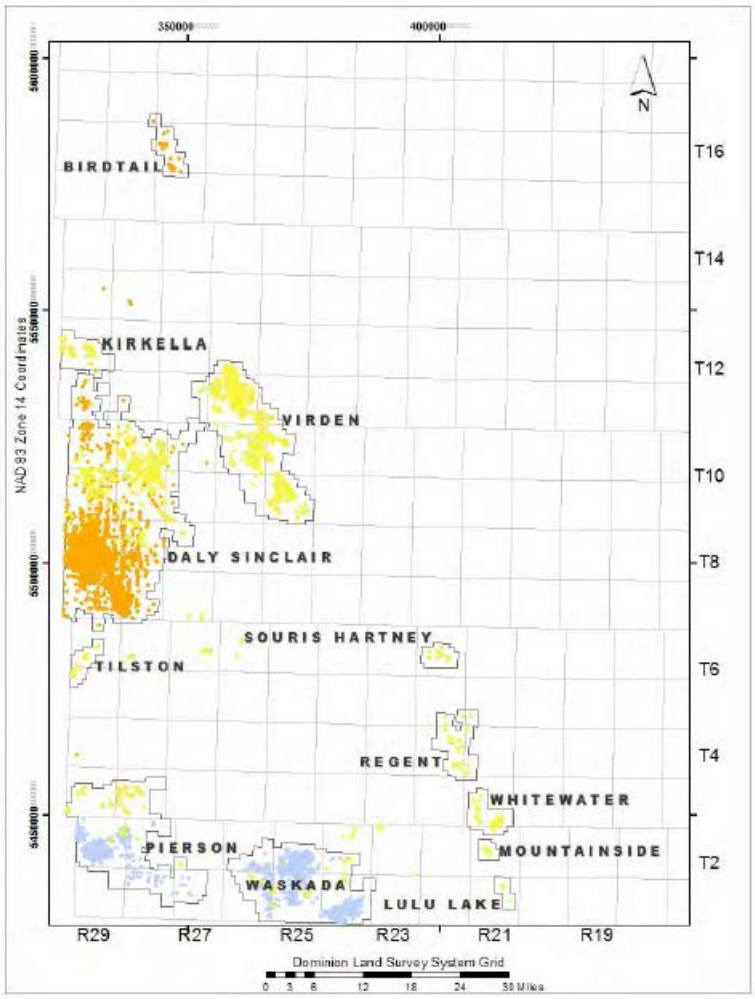

Figure 2: Map of daily Sinclair oil field in southwestern Manitoba (MB Petroleum, 2015)

Economic viability was at least partially explained by advances in production technology. It was also around this time that the combined technologies of horizontal drilling and multi-stage hydraulic fracturing (fracking) were introduced in the province (Welch, 2013). Prior to the introduction of multi-stage fracking, drilling in the province was limited to subsurface depths of about 1000 metres, primarily interventions into the Mississippian Lodgepole and Mission Canyon Formations located between 600 and 1050 metres deep. Oil culture was already in the region, but fracking technology simply amplified its cultural discourse and technological

potential. The new drilling technology introduced in the 1980s allowed for much deeper drilling capabilities, while horizontal drilling allowed operators to direct wells into previously inaccessible areas. Well production capabilities dramatically increased the scale of oil extraction. Horizontal wells have also proven to be more productive than vertical wells in the province, producing approximately 3.8 cubic metres per day compared to 1.91 cubic metres per day (MB Petroleum Branch, 2015). This meant Manitoba had a much larger potential and the drilling economy was revitalized with record breaking extraction figures the result.

Horizontal drilling ramped up Manitoba's oil production substantially. Although the technology was available in the 1980s, the real prospects of fracking were felt during the 2000s (figure 3).

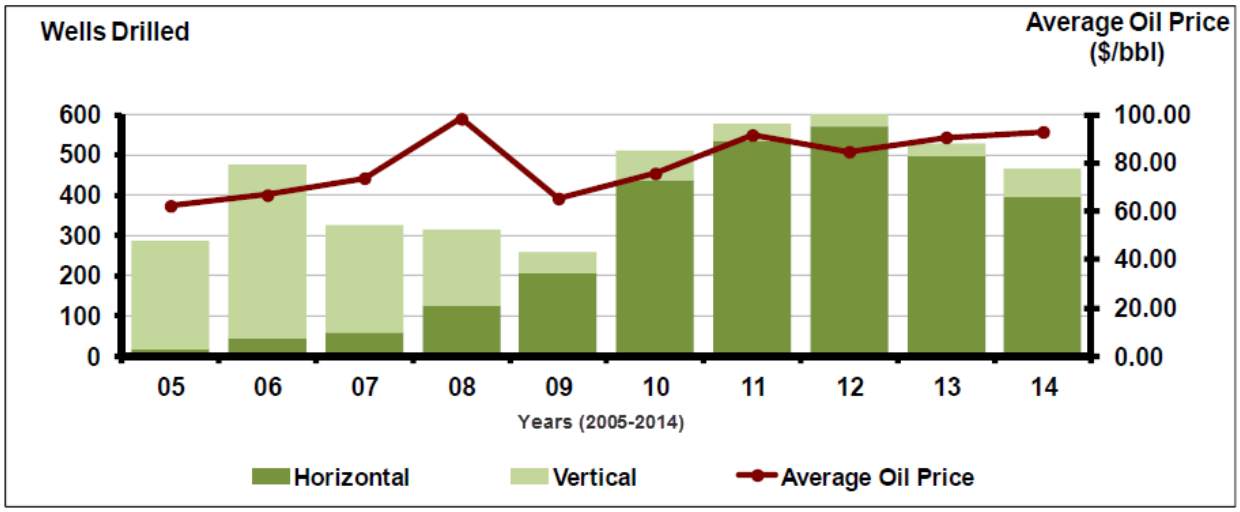

Figure 3: Comparison of horizontal and vertical drilled wells in Manitoba from 2005-2014 (Manitoba Petroleum, 2015)

The production benefits of fracking technology have carried over to current drilling practices. Most of the drilling now occurs in the Williston Basin, which encompasses the Bakkan

Formation, connecting southwestern Manitoba, southern Saskatchewan, North and South Dakota and Montana.

In 2009, it was estimated that with fracking technology there is approximately 9.5 billion cubic metres of oil that is recoverable in the province (MB Petroleum Branch, 2015). The height of the global frenzy around the new oil and gas economy in 2012 was also a record breaking year for drilling in Manitoba with almost three million cubic meters of oil produced (MB Petroleum Branch, 2015). The improvements in technology alongside high global demand created a lucrative oil market in Manitoba. This positive industrial trend continued in 2013 with 530 new wells drilled, 498 of them horizontal. The total production for the year reached just over three million cubic metres, with approximately eight thousand cubic metres of oil or over fifty thousand barrels produced each day (MB Petroleum Branch, 2015). The official online records shared by the Petroleum Branch only report up to 2013, but unofficially the high drilling numbers continued throughout 2014 (MB Petroleum Branch, 2015).

In 2015, the price of oil fell dramatically due to several factors, not least the massive amounts of oil being produced through fracking technology domestically in the Bakkan Shale and similar formations both in North America and elsewhere. In effect, the boom created by the implementation of new fracking technologies produced the conditions that have resulted in reduced prices and supply gluts, exactly the phenomena that threatens the health and capacity of the oil industry and the wellbeing of workers in the Bakken. The result of the depression in price and production is being felt presently, and is evident in the communities of southwest Manitoba, but an empirical analysis of the situation will have to wait until more current numbers are released by the government (Kives, 2015; Welch, 2013; Zinchuck, 2015).

Yet the culture of the oil industry remains and active component of southwestern Manitoba community identities, seen most prominently in Virden. The early years of exploration and the discovery of oil has stamped the legacy of oil production on the landscape. Visible markings of the industry's presence and history can be found throughout the region, especially in the unofficial "Oil Capital" of Virden. Older vertical wells can be seen bobbing next to high tech and high impact fracking pads. The community takes pride in their history of oil, even displaying the first ever oil pump jack outside of the Virden Tourism Information Center in town – seen in Figure 4 below. This pride in the industry is strengthened by the fact that many families have worked within or have leased land to the industry for multiple generations, adding personal histories and bolstering the cultural collective identity around oil extraction in the area.

Figure 4: Manitoba's Oil Cultures - the first pump jack on display in the town of Virden (K.Hlushko, 2016)

Methodology and Ethics

Ethical considerations must be taken when conducting research that has the potential to directly affect participant's lives. The University of Manitoba's Research Ethics Board (REB)

produces guidelines for students to follow to mitigate the risks that may be placed on their research subjects. By following the recommendations of the REB, the methodology I use, the way that I write and the storage of my data has been considered. I have attached a copy of the ethics protocol for my research that was reviewed and approved by the REB (See Appendix A). My aim in my research is to express the way that fracking has affected people living in southwestern Manitoba while honouring and respecting the information shared with me through interviews.

I used qualitative semi-structured interviews to understand community and individual perspectives and experiences with fracking in southwestern Manitoba. I focused on how these attitudes have been constructed, and what they mean for people living amidst the fracking boom. Participants answered a series of interview questions on how they understand fracking and the way the process has affected their lives. I followed purposive qualitative sampling methods, meaning participants were chosen because of their connection to the oil activity in Manitoba. Maximum variation sampling was used to ensure a wide spectrum of attitudes towards fracking was represented. To achieve a balanced perspective, I attempted to include a range of opinions, including those who are pro-fracking, anti-fracking, have little to no opinion, or may be ambivalent because of conflicting priorities. By contacting people over the phone, through email, and in person meetings, I engaged with policy-makers, technicians, administrators in the Manitoba Petroleum Branch, non-governmental organization employees in Winnipeg and stakeholders in Virden (the town at the centre of the fracking boom), community members, key stakeholders including oil and gas workers, local environmental groups, the Manitoba Water Caucus, and businesspeople.

I interviewed five people from industry, three from government, three people from non-government organizations and seven people from the community, for a total of eighteen interviews. The interviews generally lasted about an hour. The interviews were recorded using an audio device and the responses transcribed and analyzed after data collection. Participants were encouraged to suggest others who were interested in the study. All of the participants were aware of the nature of my research and had the option to disclose as much identifying information as they felt comfortable with.

I searched for initial participants by contacting key stakeholders in industry, government and non-government organizations through email or on the phone and asking them if they would be interested in participating in my study. Through word of mouth, I was able to contact people that were perceived by others to be involved in the fracking industry. The only qualification that I used to screen participants was whether they were either directly or indirectly connected to fracking in southwestern, Manitoba. However, since I am interested in filling a gap in information in the area, I included some people who were mostly unaware of the oil and gas activities in the area. I predominately looked for people who live or work within southwestern, Manitoba, particularly in Virden, and in the surrounding rural communities of Melita, Reston, and Winnipeg. See Appendix B for a copy of the interview questions I used.

With the permission of the interviewee, the interviews were audio recorded and I took field notes to aide in transcription at a later date. Three participants refused to be recorded, while one participant refused to be interviewed after we went over the list of questions prior to the interview. I analyzed the data to identify main themes that emerged through the interviews. I chose to highlight certain narratives so the stories of individuals would not become lost in the general themes (Green and Thorogood, 2004; Neuman, 2000).

To understand the way oil extraction is legislated in the province, I relied heavily on the resources made available by the Manitoba Petroleum Branch and Manitoba Sustainable Development. Manitoba's acts and regulations are public documents that can be accessed online. I also used archived materials that were gifted to me by staff at the Petroleum Branch. When I was not able to find certain information on the public websites, I would call or email personnel from the Branch, although this approach was often unanswered. While there is a large amount of information available to the public, specific statistics and the most current numbers are harder to come by.

Due to the potentially politicized nature of fracking, participating in my study could have economic and social consequences. Oil and gas economies directly and indirectly provide a large number of jobs for people in the province, especially in my study area centered around Virden. People may have been reticent to share their opinions about fracking if they did not align with the goals of the companies involved in extraction and servicing and government that promotes and regulates the industry. With this in mind, the threat of job loss or reprimand was taken seriously. Speaking out against fracking may also be socially alienating, since many people benefit economically from the process. Because of these risks, all participants were able to choose the level of confidentiality or anonymity for documentation. This might mean leaving names of people, businesses, organizations, locations, etc., out of my thesis, identifying participants in an encoded manner. The place and time of the interviews was also flexible, allowing the participant to choose the most appropriate form and venue of communication. In person, over the phone and email interviews were all options. All electronic data was protected by inscription software, and hard data was kept in a locked storage cabinet at the University of Manitoba. This process was approved by the University of Manitoba Research Ethics Board.

Through these methods, the social and economic risks of participating in this study were mitigated, and any identifiable factors included will be at the discretion of the interviewee.

I acknowledge that I was not able to represent every viewpoint on the topic, but the range of my research ensures the major themes were covered and a strong and representative diversity of perspective can be included. The small interview sample size can be partially attributed to the politicized nature of the topic, a transient workforce, my position as an outsider of the community, and the time restraints for collecting field interviews. As a result I observed reluctance in participants to speak openly or even associate themselves with fracking. A more robust sample size may have provided a clearer snapshot into the lives of those living amongst fracking, however, the silence I received – especially from the industry, is in line with the reality that the oil industry in Manitoba operates 'behind closed doors.' My research aims to illuminate some of the barriers to obtaining current and meaningful information.

Roadmap of Thesis: What to expect from my research

By using a combination of formal interviews, literature reviews, grey material searches, and personal observations and experiences, I have produced an academic portrayal of the fracking experience in southwestern Manitoba. I have woven together empirical detail with stories and policy perspectives to interpret what it means to live interconnected to oil extraction in the province.

My research is broken into three chapters. The first chapter is focused on oil legislation and regulation in Manitoba. In this chapter I examine the legalities of oil extraction in Manitoba, and ask questions about how environmental and health concerns fit into the legal structure. The second chapter explores theories of environmental governance. I use a critical approach to

neoliberal visions of human-environment relations to uncover influences on the way humans and nature intersects within fracking spaces in Manitoba. The last chapter is empirically based, and pulls together the interviews I conducted to support the claims I make in the first and second chapter. I argue that fracking is more than just the apolitical act of extracting oil from the ground, but a complicated network of nature, technology, culture and power.

Due to practical constraints as well as a general unwillingness to speak openly about fracking, I acknowledge that I do not capture every perspective. However, I believe I illuminate cracks in the legislation, governance and experience of fracking in Manitoba and pose valid questions around the secretive nature of the industry particularly in this province. Finally, I do not claim to have the answers to the questions I have untangled from this research experience, but I encourage others to further this research endeavor.

Chapter 2: Legislating the Oil Boom: Governance in Manitoba's Oil Industry

Government legislation provides the skeleton of industry, shaping extractive operations to reflect the ideals of the governing body. These regulations are supposed to act as a rule book that reflects the values of the citizens, ensuring that communities and the environment are protected from negative impacts. When legislation has gaps, is outdated or unbalanced towards economic growth over other relations, industry operations cause friction in communities, and those most affected may feel powerless to be heard by the regulating bodies. When trust is broken between industry, government and community, legislative checks and balances are no longer enough to protect individuals from harm (Darnall et al. 2009; Pfaff and Sanchirico, 2000; Potoski and Prakash, 2005). Because of the lack of coherent and synthetic information on the legislation and administration of the oil and gas industry in Manitoba, I had to "go back to the well" (so to speak) in order to effectively interpret the oil and gas stories told in later chapters.

Like most extractive economies, the oil industry in southwestern Manitoba requires government, industry and community cooperation for effective governance. The intended outcome is an industry that reflects the goals and needs of those affected by the legislative process. The primary actors in this process are the Manitoba government's Petroleum Branch, the federal National Energy Board, major industry players such as Nordic Oil and Gas Ltd, Tundra Oil and Gas Partnership, EOG Resources Canada Inc., Pennwest Petroleum Ltd., ARC Resources Ltd., Canadian Natural Resources Limited, Legacy Oil and Gas Inc. and Surge Energy Inc., and diverse community groups like the West Souris River Conservation District, the Surface Rights Association, and Virden Skills Training Inc. Rules and regulations are created and enforced by the Petroleum Branch, creating a system where oil companies act as business

proponents, and community members as stakeholders and subjects of community, corporate, and extractive relations.

The legislative framework allows the state[1] to regulate relationships between the industry and the environment, with the ostensible governance goal that the biophysical world is protected and any community concerns about the industry are addressed. In reality, the regulation of corporate and extractive behaviour is much more complicated than what is projected in the basic government-as-regulator framework (Garvin, 2001). This becomes apparent when examining local activities of the oil industry in Manitoba. Industrial activities are developed not only in relation to local government policy but also to larger economic ideologies and market processes, and to cultural and political engagements (Dyer, 2009; Florini and Sovacool, 2009; Huber, 2011, 2013). These grander-scale influences shape the goals and roles of local industrial patterns to match economic growth models of capital gain. This framework values the overarching belief in the virtue of economic growth and reliance on the productive and self-regulatory capacity of the market shaping the way we interact with our surroundings, redefining the biophysical into natural resources (Bakker, 2005; Bridge, 2010; Castree, 2002).

In this chapter I discuss the current legislative framework that governs the provincial oil industry, enacted by the Manitoba Petroleum Branch and the federal National Energy Board. I challenge the notion that there is separation between stakeholder's roles, especially government regulators and industry representatives, by examining areas of overlap where allied interests emerge (Darnall et al. 2009; Garvin, 2001). I reveal gaps in the way Manitoba's oil industry is legislated compared to other provinces. Through an examination of the acts and regulations applicable to the industry, I create a compact guide to oil legislation in southwestern Manitoba,

[1] State in this instance refers to the Government of Manitoba - more specifically the Petroleum Branch

revealing overlaps, gaps and ambivalences. No such analysis of the oil and gas legislative apparatus exists for the province – an egregious gap in a province with a small but economically sustainable oil and gas economy. Industry proponents are obviously conversant in the governance mechanisms of the oil and gas industry. It is their bread and butter. My aim, however, is to build an empirical and analytical platform for other interventions to build upon because oil and gas governance remains opaque for the average citizen and for academics and policy interveners with an interest in Manitoba's extractive economies. Additionally, the material set out in this chapter provides the empirical foundation for the arguments in subsequent chapters.

Fracking Legislation in Manitoba

As the drilling economy developed in southwestern Manitoba, so too did the system put in place to govern the industry. The Petroleum Branch – the government division responsible for all oil and gas development in the province – developed the framework that dictates how the industry must legally conduct operations. The existing regulations are heavily focused toward the technical parameters of drilling, dimensions of critical health and safety importance in an industry with some industrial hazards attached to operations. This legislative apparatus is vital to any extractive industry but I focus on legislation that addresses the environmental and social components of the industry because this area has received relatively little attention from government regulators and media outlets. The lack of clear and directive guidelines on how the industry should address impacts that affect communities and their environments has left many of these relations up to the discretion of the company. The spaces left open by Manitoba's legislation creates an equivocal and uncertain dynamic between industry and society, prompting questions about the role of the oil industry in Manitoban communities, and about the ambiguities

in social and economic relations produced within this dynamic. By examining the Federal regulations and the *National Energy Board* alongside the provincial *Oil and Gas Act,* with special attention to the *Drilling and Production Regulations,* the *Surface Rights Act,* the *Water Rights Act,* and the *Air Quality Regulations* I address the legal regime created around oil extraction in Manitoba to argue that the current legislation does not provide adequate legal instruction on how the industry, people and their environment must coalesce to ensure a positive and just outcome.

The Petroleum Branch

In Manitoba, drilling, hydraulic fracturing, oil extraction and intra-province transportation of hydrocarbons fall under the jurisdiction of the Petroleum Branch, housed under the Provincial Growth, Enterprise and Trade Department. The oil industry is unique compared to other natural resource developments in the province because remarkably, its activities do not fall under the provincial *Environment Act.* The Act is designed to ensure that any private or public development in Manitoba is assessed for environmental impacts, including both biophysical and social concerns, *before* construction begins. Proponents to development are required to submit a proposal to Manitoba Conservation and Water Stewardship (MCWS), where the project is evaluated and classified according to the expected impact (Diduck and Sinclair, 2002). Development plans with the potential for environmental or social impact trigger a provincial Environmental Impact Assessment (EIA) under the *Environment Act* to predict, evaluate, mitigate and monitor effects. This process requires proponents to submit a development proposal to the *Clean Environment Commission (CEC)* - a board of government-sanctioned technical experts who assess and suggest potential amendments to the project. Depending on the project, the CEC may invite public input to ensure that those who will be affected have a voice in the

planning process. The process of review and comments is repeated until the CEC is satisfied that adequate protective measures are in place. MCWS monitors the project throughout the lifecycle of the development to ensure that the requirements outlined in the EIA are upheld, with monetary fines and stop-work orders acting as penalties for non-conformity (Eckert, 2004). Instead of the EIA system put in place by MCWS's *Environment* Act, the social, environmental, technical and economic concerns of the oil and gas industry are addressed in-house by the Petroleum Branch. Because oil development is not classified under the *Environment Act*, the Petroleum Branch has become a one-stop-shop for all industry-related planning, development, decommissioning, regulations and licences. Oil and gas development is outside of the EIA process in Manitoba, relying instead on the governance processes of the Petroleum Branch.

Due to legislative organization, the oil industry in Manitoba simply does not have the same material checks and balances as other extractive industries. The already large volume of work has become magnified as the drilling boom has taxed Branch personnel. Inspectors face an increasing workload, with a limited number of petroleum inspectors employed in the Branch. There are currently three full-time petroleum inspectors at the Branch who are responsible for overseeing all drilling and exploration in the province (Allan, 2014).

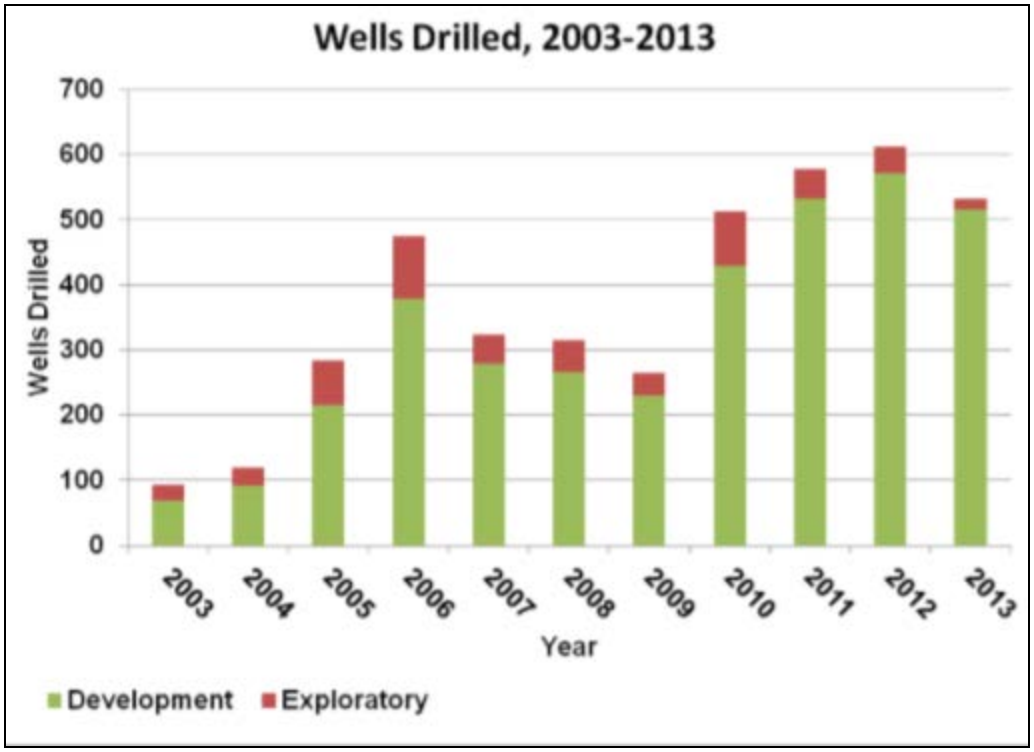

Figure 5: Wells Drilled in Manitoba from 2003 – 2013
(MB Petroleum, 2015)

The arithmetic here puts the staffing problem in stark relief. As seen in Figure 5 the number of wells being drilled in the province has increased over the past decade, peaking with just over 600 wells drilled in 2012. Drilling success has meant that the workload for inspectors is increasing dramatically but the number of employees has remained static. In response to the potential backlog, the Petroleum Branch has created a streamlined process, where proponents need to navigate the bureaucratic system of only one branch of government. In other ways, the system is isolated and is not designed for the same amount of public input, expert suggestion and flexible planning as is possible within the *Environment Act.* The chronic staff shortage has created some public concern over compliance issues being overlooked or unreported. In a 2013 article for *Western Producer*, Carlyle Jorgensen, a long-time farmer in Manitoba's oil region, spoke about his experiences with an underground flow line spill on his neighbour's land in the

winter of 2012. Approximately 100,000 litres of oil spilled from the pipe, contaminating the soil and harming his farming operation. Jorgenson believed the line was broken for weeks before it was detected (Arnason, 2013). As demonstrated in the article, many believe there are not enough government regulators in the field conducting necessary audits and inspections, while initial approvals were also inadequate, placing an unofficial responsibility on landowner's to monitor their land for oil spills and contamination. This shifts the responsibility from the companies and government regulators onto the landowner – changing the narrative from a preventative approach to reactive surveillance.

Federal Influences on Southwestern Manitoba's Oil Patch

In Canada, as a result of constitutional division of responsibility for resource governance, oil and gas legislation is under the jurisdiction of provincial and territorial governments (Natural Resources Canada, 2006). This means that the way the industry operates varies across the country due to regional political differences and geological endowments. The federal government also has strong political influences over the Canadian oil industry, through federal legislation and tax regimes, and supporting specific research through funding.[2] Natural Resources Canada (NRCan) is the federal department responsible for "enhancing responsible development and use of Canada's natural resources and competitiveness of Canada's natural resource products" (NRCan, 2016). NRCan supports Canada's provincial, territorial and international energy economies through policy, technology and practices (NRCan, 2016). The specifics of

[2] Under the P.E. Trudeau Liberal government the National Energy Program (NEP) was put in place from 1980-85 as part of the federal budget as a response to the recession caused by the OPEC oil crises of the 1970s. The NEP goal was an autonomous national energy supply for Canada that would withstand global fluctuations in oil prices. This caused friction amongst western energy producing provinces that felt the NEP was infringing on their right to regulate provincial industries. The NEP dissolved in 1985 by the Chrétien government after global oil prices fell (TCE, 2005).

Canada's oil and gas industry are addressed by the National Energy Board (NEB). NRCan keeps track of national energy supply and demand, monitoring production levels in accordance with global markets, while the NEB acts as an autonomous agency to regulate the construction, operation and abandonment of pipelines, powerlines and fossil fuels crossing borders. In 1959, the federal government launched the NEB to act as an independent, quasi-judicial regulatory board for oil and gas activities that cross domestic and international trade lines (NEB, 2014). Under the federal *National Energy Board Act,* the *Canadian Oil and Gas Operations Act,* and the *Canada Petroleum Resources Act* the federal government oversees the physical transport of fossil fuels and manages trade relations. The movement of oil through a combination of pipelines, rails and trucks is orchestrated by the NEB, delivering Canadian oil to supply national and international markets. Proponents are required to submit an application to the NEB for any plan to transport oil over national or international boundaries. Depending on the scope or and/or location of a project, the proposal may trigger an environmental assessment and/or a public hearing through either the *Canadian Environmental Assessment Act (CEAA 2012),* the *Mackenzie Valley Resource Management Act,* the *Inuvialuit Final Agreement* or the *Nunavut Land Claims Agreement* (NEB, 2014). The board is made up of professionals in natural resource extraction, business, engineering, law, environment, geology, or Indigenous and northern relations who serve in both permanent and temporary three–year terms (NEB, 2014). It is the duty of the board members to represent Canadians in all federal energy matters and ensure that environmental and social affects are considered.

Federally Funded Oil Research in Manitoba

The federal government also influences and supports Canadian industry by funding specific research that develops the industry across the country. This can have significant local

outcomes, but the effects of innovation are dispersed across the industry. Much of this research is funded through universities, certainly in Alberta, but increasingly in other Canadian oil and gas provinces. For instance, in January, 2015 the federal government granted the University of Manitoba $2.4 million to establish the Centre for Oil and Gas Research and Development (COGRaD), centered in the University's chemistry department. COGRaD's focus is on environmental services and remediation research for the industry, formally documenting and studying southwestern Manitoba's oil industry from an environmental science perspective for the first time. Along the same lines, we might also point to bourgeoning research relationship on oil spills between university researchers in Manitoba and the Experimental Lakes Area, a former federal limnology research facility that has been recently privatized under the auspices of the Winnipeg-based International Institute for Sustainable Development (IISD), with support from the provincial governments of Manitoba and Ontario. In this way, industry, academia and government coalesce around the promotion of new tools to equip researchers to better service the oil industry and to develop innovative tests to quantitatively measure chemical changes to the environment. These tests will be developed locally in Manitoba, but the results will be shared nationally, influencing industry practices and policy across Canada (UM Today, 2015).

Northern Manitoba's oil export potential is also gaining academic attention as a new $28 million marine research center is being proposed in Churchill, Manitoba. The Universities of Manitoba, Calgary, Victoria, Laval and Dalhousie are partnering with the province of Manitoba, Canadian Foundation for Innovation and the federal department of Aboriginal Affairs and Northern Development to construct the Churchill Marine Observatory (CMO). The focus will be on technical, economic and scientific impacts of oil spills on global climate change and marine ecosystems as the Churchill port is expected to play an increasingly important role in Canada's

developing oil and gas industry. The federal and provincial government, along with oil exploration, development and transportation industries are expected to be closely involved in CMO through partnerships, funding and knowledge transfer (CEOS, 2015; Cross, 2014; UM Today, 2015).

The nature of COGRaD, the new ELA and CMO questions the purpose of government and industry-funded research with the federal government's interest in expanding the oil economy to use domestically and sell overseas (NRCan, 2016). Since the funding for the COGRaD and CMO's oil and gas research comes from government coffers, it is possible that the scope, direction and outcomes of the studies may be influenced by federal agendas (which have arguably not changed in the wake of changing governments, only shifted focus). The way that Manitoba's environment is observed and how the results are interpreted is intimately tied to funding, which is currently framed towards oil exploration, development and export. Even with the recent downturn in oil production (Kives, 2015; Rabson, 2016), Manitoba's oil potential is attracting federal government interests in funding research to advance local economic development.

The Oil and Gas Act: Outcomes, Adherents and Elisions

Manitoba's *Oil and Gas Act* is the regulatory skeleton for proponents interested in development as it provides technical guidance on well development. *The Act* methodically directs industrial clients through each procedure required to run a government approved oil or gas operation. Companies that wish to drill in Manitoba are required under *The Oil and Gas Act* to obtain a 'Geophysical Licence' to survey the terrestrial and subterranean geology plus a 'Well Licence' to drill, operate and carry out well-related activities. In practice, proponents survey

particular locations to determine oil productivity before obtaining a Well Licence. A proponent cannot obtain a Well Licence before meeting the requirements of *The Surface Rights Act* (discussed in greater detail below). The figure of the Petroleum Branch Director holds an extraordinary amount of discretionary power over the practice and process of oil and gas extraction in the province. The Director is responsible for halting development for environmental reasons, leaving the diagnosis of 'significant environmental impact' up to the Director's interpretation (The Surface Rights Act, 8.93). On the face of it, the policing of environmental and social relations that emerge out of the oil economy are at the sole discretion of the Director. The categorization of sites as 'fit for development' does not guarantee that long term impacts, or affects that have not yet been connected to the relatively new technology of fracking/horizontal drilling will not be felt. Once a well site is granted approval, changes to the environment that cannot be directly linked to the well sites are overlooked, leaving affected people with little opportunity to seek compensation or remediation through the Branch. Conversely, under the *Environment Act* as discussed above, every proposal (with the exception of oil and gas development) must take all environmental and social concerns before a third party – *the CEC* – to ensure the project will not cause undue harm. Oil and gas developments only have to secure approval from the Branch Director, who is simultaneously responsible for growing the industry, developing a profitable industry for the province and regulating the industrial behaviour of oil and gas companies. This potential conflict exacerbates concerns about the Director's ability to protect those who may be harmed by well development (Bell, 2001; Dyck, 2015).

Environmental legislation can be juxtaposed against the steadfast concern for workplace safety in the industry. Workplace safety is an important frame within the Act; proponents of the oil industry must comply with the provincial *Workplace Safety and Health Act* which focuses on

ensuring that community and worker health and safety risks associated with industry activities are addressed and minimized. For instance, a permit is needed for the disposal of salt water (often called 'produced' or 'slick water') produced in the process of re-injecting fracking solution back into the ground (The Oil and Gas Act, 109.1).[3] It is also the responsibility of the oil battery operator to make a *reasonable* (emphasis added) effort to reduce the amount of pollution released and to prevent spills (The Oil and Gas Act, 114.4 & 119.1). What actions are considered 'reasonable' is again at the discretion of the Director. This built-in interpretative logic allows companies to prove due diligence as long as their efforts appear reasonable to the Director. Without clearly defined guidelines for pollution control, the standard for risky behaviour becomes ambiguous. Companies have also been encouraged to pool their pollution reduction efforts to reduce costs while providing better protection. The Petroleum Branch has established an "Oil Spill Cooperative" which combines the efforts and resources of multiple operators for dealing with oil spills (The Oil & Gas Act, 120.1). The battery operator must also take steps to stop or mitigate pollution if there are any human health or environmental consequences (The Oil & Gas Act, 114.2).

Despite the stated focus on matters of environmental protection, it is again up to the Branch's Director whether the operator needs to develop and file an Environmental Protection Plan. An Environmental Protection Plan is a project specific document created by the company that sets out corporate policies regarding the project's environmental emergencies and other instructions on matters of compliance with government legislation. Normally, an Environmental Protection Plan is a requirement of the Environmental Impact Assessment required under the Environment Act. Once again, the inclusion of an Environmental Protection Plan is based on the

[3] Much of the salt water produced in fracking operations in Manitoba is disposed in facilities located across the border in Saskatchewan. This is another area of study that requires academic and public attention.

Director's assessment of the environmental sensitivity of the area under consideration (The Oil & Gas Act, 120.1, 120.2). If the Director requests an Environmental Protection Plan for a well proposal, the plan must include a description of the emergency response, maps of waterbodies, spill control points, road access, pipelines and proposed wells, equipment to be used for spill response, procedures for spills, policies for worker safety, and personnel duties during an emergency response (The Oil & Gas Act, 104.1). Plans are time-consuming and expensive. It is also up to the Director to declare any state of emergency (The Oil & Gas Act, 121.1), approve a well abandonment (The Oil & Gas Act, 122.1), or to ensure abandoned wells are properly rehabilitated (The Oil & Gas Act, 125 & 171.4). It is a position of extraordinary discretionary power and immense responsibility, especially for an unelected civil servant.

If an operator is found to be non-compliant under *The Act,* petroleum inspectors hold the power to shut the operation down (The Oil & Gas Act, Part 15). Because the Director determines the effort companies must put into environmental protection and planning and by not having specific guidelines requirements for environmental protection, companies have the opportunity to bypass many of the expensive and time-consuming planning, monitoring and mitigation efforts that are legally required in other industries.

Safety Culture and the Universalizing of Risk and Responsibility

The allowance of varying levels of environmental protection that is built into *the Oil and Gas Act* is in stark contrast to the strict and clear regulations outlined in workplace health and safety legislation. Historically, workplace health, safety and environment (HSE) has been governed as one function unit (Hale and Hovdon, 1998). Recently, the government of Manitoba has unpacked the HSE bundle, establishing workplace health and safety rules, regulation and a

"culture" separate from their environment department. Manitoba regulates workers' health and safety in the the *Workplace Safety and Health Act,* which came into effect in 2014 (WSHA, 2015). Industrial activities are moderated through the prevention organization SAFE Work Manitoba in partnership with Workplace Safety and Health, and the provincial Worker's Compensation Board. This organization works to promote healthy and safe work places through promotion, protection and education by making health and safety "everyone's responsibility" (SWM, 2015). The implementation of the "safety culture" has successfully permeated down the corporate ladder of the oil and gas industry, appearing as a policy directive everywhere from boardrooms to worker's daily routines in the field.

While workplace safety and health has been pushed to the forefront of Manitoba's industries, a strong corporate "environment culture" is lacking in comparison. In many respects, health and environment are oppositional frames for corporate behaviour. Colin, an employee in a Manitoba-based oil servicing company suggests "for us, we are definitely concerned about the environment, but it's more about the health and safety side. We deal with the hazardous chemicals, we put on seventy-five thousand clicks on our trucks every year transporting dangerous goods. We definitely have a health and safety culture" (Colin, 2014). Tundra Oil and Gas, a local industry leader in Manitoba, has a dedicated safety page on its corporate website. Tundra claims to be committed to the health and safety of its employees, contractors and the public, going so far as to "recognize that no business opportunity will be pursued at the sacrifice of safety" (Tundra, 2016). The major pipeline outfitter in the province, Enbridge, released a 2014 "Safety Report to the Community" boasting the company spent $74 million dollars between 2012 and 2014 on safety training and equipment, as well as 162,000 hours or roughly 18 hours per employee for health and safety training" (Burnett, 2014). As Colin, Tundra Oil and Gas, and

Enbridge demonstrate, considerable effort has been put in place by the Manitoba government, corporations, unions and workers themselves to ensure that workplace health and safety is a top priority. It is interesting to note that the public sector is generally unionized, which has arguably led to the increases in worker health and safety, yet the neoliberal agenda that drives the industry challenges the role of the union (Gillen et al. 2002; Weil, 1999),. Although enthusiasm for corporate environmental awareness is growing in Manitoba's oil industry (Tomorrow Now – Manitoba's Green Plan, 2014) it has not had the same systemic success that workplace health and safety has had.

The concern with health and safety must be juxtaposed with the method of disposal of natural gas. Oil and natural gas are often found in the same geological formation, however, in Manitoba natural gas is considered a by-product, partly because the province has not built the physical infrastructure to harness and transport gas to market. Instead of harnessing the gas for production like other provinces and states, Manitoba burns off associated gases in a process called flaring, quite literally lighting the gas on fire and releasing it into the atmosphere (Welch, 2013). The process of flaring is known to cause health and environmental contamination, as the example of sour gas in Alberta has shown (Boxall et al., 2005, Masuda et al. 2008; Nikiforuk, 2015; Waldner, 2008). Flaring and the production of hydrogen sulphide (H_2S) gas (also known as sour gas) is also addressed under *The Oil and Gas Act.* Because of potential environmental and health concerns accompanying the release of H_2S, proponents of wells must take into account comments and concerns over gas exposure from landowners and occupants within 500 meters of the battery. In 2013, Manitoba's oil industry released 813 kilotonnes, or the equivalent of 168,000 cars on the road for a year, of greenhouse gas emissions through flaring. These emissions accounted for three to four percent of the province's total greenhouse gas emissions

(Welch, 2013). Plans must be implemented for flaring and venting systems, as well as air dispersion models to predict gas movement in the surrounding atmosphere. Special measures should be taken to reduce venting, control odours and to improve the flaring systems (The Oil and Gas Act, 76.1.3) but the fact remains that, because of an infrastructure deficit and a lack of political will, gas is released into the atmosphere alongside the production of oil in Manitoba. The gas is gone forever, along with any potential economic profits, though environmental effects persist.

Safety culture also mediates interactions with gas at the work sites. Workers at the battery are required to be certified in "H_2S Alive" training, which focuses on working safely around the potentially toxic gas (The Oil and Gas Act, 85.1). It is up to the discretion of the Director to order an operator to take steps to prevent, eliminate or reduce the release of gas on a site (The Oil and Gas Act, 88.1). Once again, a public health concern rests with one very powerful bureaucrat. Manitoba is not the only jurisdiction that allows flaring, but unlike Alberta, British Columbia and Saskatchewan, it does not have a limit on flaring (Welch, 2013). As Dennis LeNeveu, an environmental consultant working at the time in Manitoba's oil patch explains in the *Winnipeg Free Press*, Alberta, B.C. and Saskatchewan have created regulations to severely limit flaring, and they have not done it for a reason – it is a big environmental polluter. Manitoba just turns a "blind eye" as quoted in Welch, 2013. Due chiefly to concerns about effects on climate, the release of greenhouse gases into the atmosphere via flaring has been strictly regulated and reduced among the major fossil fuel producing provinces. Alberta, Canada's top oil producer, has reduced the amount of natural gas flaring by 80% from 1996 to 2010, while British Columbia, another large producing province moved to ban routine flaring altogether by 2016

(CAPP, 2015). In many respects, Manitoba's oil legislation remains outdated while other provinces adapt to changing technological and environmental conditions and attitudes.

Buried Networks: Pipeline and Flowline Legislation

Pipelines and flowlines are also regulated under *The Act.* Any pipeline that runs within Manitoba without crossing provincial or international borders is the responsibility of the Petroleum Branch. Enbridge has a major pipeline, Southern Lights Pipeline (Line 13), running from Northern Alberta down through Saskatchewan and Manitoba to the United States and then north again through Ontario. As Figure 6 shows, this giant oil artery passes through Cromer, Manitoba – the site of an Enbridge mainline terminal (Burnett, 2014). Locally produced oil is transported from individual wells through shorter "flowlines" to oil batteries or oil storage facilities then to the Cromer terminal, where it joins the larger pipeline network.

Figure 6: Enbridge Pipelines across North America
(Burnett, 2014)

In order to construct a new pipeline, a flow/pipeline licence is required. A petroleum inspector must approve the construction design and the necessary surface rights must be acquired. A flow/pipeline will not be approved if it will endanger human health, safety or the environment (The Oil and Gas Act, 154). Once the construction is complete, a new licence is required to operate the line.

Oil Spills and the Threat of Environmental Disaster

Pipeline and flowlines are areas of concern for many communities because their linear design crosses multiple property boundaries and ecosystems, linking neighbours by oil flow. This is also the technology that is most susceptible to oil spills, made even more precarious by its expansive spatial imprint (Kheraj, 2015). Due to the pipes being laid underground, it is hard to visually monitor for cracks, spills and wear and tear. Community members must rely on companies to ensure that their lines are in proper working order and are maintained to provincial codes. Yet many close to the industry are skeptical of the ability of provincial guidelines and inspectors to monitor the network of pipe and flowlines. As Carlyle Jorgensen, also acting Vice-president of the Manitoba Surface Rights Association, describes:

> The province has very few regulations for flow lines. If it was in an oil and gas facility, the welder would have to be certified for that specific size and type of pipe. Yet when they put pipeline in the ground, the can pick up somebody off the streets of Virden that doesn't even know what a crescent wrench is. He could put that pipe in the ground with absolutely no supervision from the province. (quoted in Arnason, 2013).

As Jorgenson explains, current legislation does not require much direct instruction or supervision from the government about pipeline installation. This approach, coupled with the shortage of petroleum inspectors, leans on industry self-regulation, placing confidence in companies to follow best practices. This approach sometimes fails. In January 2015, a leak from an underground Tundra Oil and Gas flowline in southwestern Manitoba near the Saskatchewan border went unnoticed for a considerable time causing approximately 100,000 liters of oil to be spilled onto adjacent farm land (see Figure 7). Tundra Oil and Gas claim the flowline spilled for ten days before company intervention, but community members neighbouring the spill suggest that it was likely closer to a month of undetected leakage (Dyck, 2015).

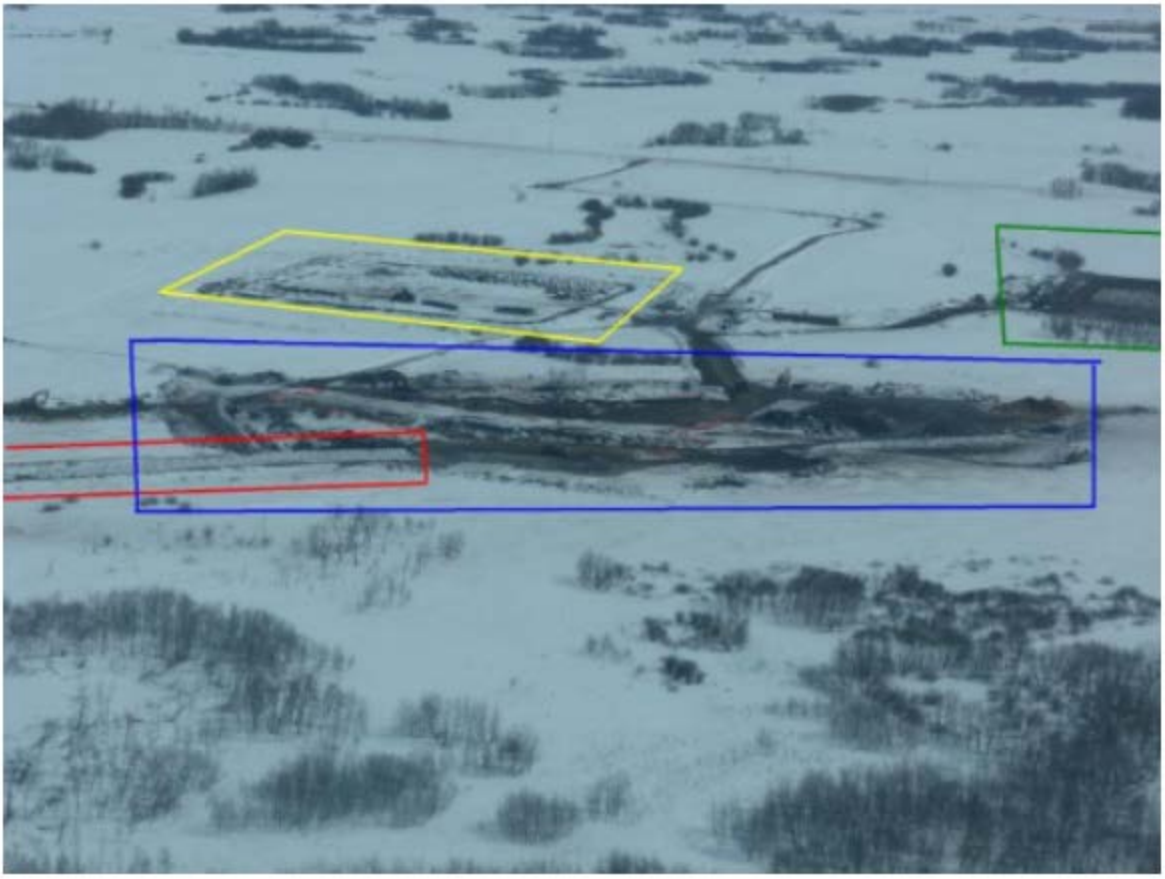

Figure 7: Aerial Photograph of approx. 100,000 Liter Oil Spill from Broken Underground Flowline in Southwestern Manitoba near Saskatchewan Border in January 2015 - Spill is outlined in Blue
(Dyck, 2015)

To be sure, industrial operators have a vested interest in maintaining a good safety and environmental record. Spills and accidents are bad for business and they erode the public's confidence cultivated by individual operators and the industry at large. Yet much of the pipeline watchdog responsibility is downloaded onto landowners themselves. It is often landowners who discover leaks in pipes by noticing dead patches in their fields or other environmental disturbances to their land. This places an indirect onus of responsibility to watch for signs of leakage. For example, in March 2015, approximately 300,000 liters of crude oil, salt water and bitumen spilled from an oil/water separator onto 2.5 acres of farmland near Cromer. The spill

was identified when fluid was discovered to be pooling in a low-lying area. Specifically *who* discovered this spill is left out of the report, yet Harv Jacobsen of Corex Resources explained to the *Winnipeg Free Press* that "the guys were there the day before and it wasn't spraying, so it happened at some time through the night" (Tweed, 2015). While the immediate remediation costs and labour is the responsibility of the oil companies, landowners are stuck living with the lasting legacy impacts of contaminated soil. Landowners are caught in a paradoxical relationship between the economic benefits of oil leases and the potential material hardship of leak risks. As Carlyle Jorgenson explains, "[t]he position that a lot of us are starting to realize is that there isn't any amount of money that could be paid to us landowners for us to accept the environmental responsibility that comes with having these types of installations on our land" (CBC, 2013). The threat of spills is very real. In 2014, Manitoba's petroleum industry reported a total of 96 spills, with the majority of the spills from oil wells (33%), and pipelines/flowlines (17%). It is clear that increased production correlates with increased spill risk. In 2013, the Petroleum Branch reported 126 spills, the highest number in 25 years of record keeping (MB Petroleum Branch, 2015). The numbers may even be higher, as the Branch figures are derived only from spills that were officially reported to the government and occurred on leased land. Spills off of leased land or less than 500 litres, even when officially reported, are not counted in Branch figures (MB Petroleum Branch, 2015).

Again, the figures employed by the Branch are less onerous than those employed by equivalent regulatory bodies that administer other industries in Manitoba such as hydro-electricity, mining, agriculture and forestry (MCWS, 2015). For instance, Manitoba Conservation and Water Stewardship (MCWS) requires the reporting of any fuel spills over 100 litres, ethanol glycol spills greater than 5 litres and any amount of hazardous material that enters

the water (MCWS, 2015). Additionally, the quantity limits of reportable spills for the oil industry are not available to the public, either online or otherwise, like they are with MCWS. Personal communications with a senior petroleum inspector provide some details on how Branch personnel conceive of the differences in task, application and industrial clients (MB Petroleum Branch, 2015). The difference, I was told, lies in the very nature of the industries regulated by each unit. The Petroleum Branch's reportable spill quantities are higher compared to MCWS' because the MCWS' work is "upstream" and the Petroleum Branch's is "downstream".

The material risk of the product under consideration is used to justify the comparative leeway given to oil economies and, in particular, to the precarious movement of its product (Bridge, 2004; Peyton and Franks, 2016; Zalik, 2010). The notion of 'precarity' is important here in the Branch analysis of what constitutes a hazard (Stephenson et al. 2012; Stephenson and Shaw, 2013; Huber, 2008). In this reckoning, the Petroleum Branch regulates unprocessed crude materials (downstream) while MCWS deals with processed hazardous materials (upstream). The downstream movement of unprocessed materials is inherently more risky, therefore, allowable spill numbers are necessarily higher. Additionally, the subterranean position of most pipelines has shaped the culture of regulation and enforcement. It is as though the economic value of oil validates fracking technology as a means, justifying downstream spills and other impacts as a necessary side effect. In this respect, pipeline administration has focused on reactive efforts on spill response and remediation (Arnason, 2013), rather than preventative measures.

Decommissioning and Remediation: Attempts to Erase a Well

Wells also have a finite productivity. The afterlives of individual wells are an important consideration in the development of oil and gas legislation. Part six of *the Act* instructs operators

on well abandonment and remediation. Within the remediation guidelines, the optics of disposal and spills intersect. All drilling fluids and liquid wastes must be disposed of properly. Drilling companies may dispose of brine or salt water by injecting it back into the ground. Drilling companies must obtain a 'Salt Water Disposal Permit', gain approval from the Branch for the disposal well site by conducting geological surveys and submitting diagrams, collecting written consent from all royalty owners and working interests within 0.5 kilometers from the well, document a discussion of any anticipated impacts for the owner, and pay $200 to the Branch (MB Mineral Resources, 2013). Drilling fluid is vaguely defined by the Branch under Oil Field Waste as "a fluid used in the drilling, completion, servicing, or abandonment of a well" (The Oil and Gas Act). Drilling companies keep their specific drilling fluid recipes a proprietary secret, leaving the public in the dark about the specific chemicals being used. In Manitoba, like the rest of Canada, the contents of fracking fluid are protected under the federal *Hazardous Products Act*, which exempts a supplier from disclosing chemicals and concentrations of trade-secret formulas (WHMIS, 2016). Although there has been some discussion of a Manitoba Petroleum Branch supported "FracFocus" website – where companies will be encouraged to disclose chemical information to the public – the webpage is currently under development and directs interested parties back to the Petroleum Branch (FracFocus, 2016). Drilling fluid may be sprayed across the adjacent land (landspreading) as a means of disposal, though a sample must be submitted to the district office of the Petroleum Branch, and consent from the surface owner and petroleum inspectors must be secured. *The Act* does not provide much detail on the means of disposal if the landowner does not consent to landspreading, only that the drilling fluid will be disposed of "in a manner approved by the Director or an inspector" (The Oil and Gas Act, 59). The site is to be returned as close as possible to pre-constructed conditions (The Oil and Gas Act, 58). Once the

site has been remediated, the petroleum inspector will examine the vegetation and may take a soil sample (The Oil and Gas Act, 59). Once the inspector and the surface owners are satisfied a certificate of abandonment is issued.

Site remediation places the reconstruction of local ecologies as its primary goals in order to reconstruct a productive landscape as if oil development never occurred. Remediation guidelines cannot, in this instance, account for issues that cannot be obviously seen such as community concerns like social disruption of an existing way of life or vulnerability caused by a boom and bust business cycle (Willow, 2014), nor does it properly consider the contingent nature of the movement of organic materials through an ecosystem or non-linear time scales of contamination and potential health concerns (CCA, 2014; Krzyzanowski, 2012; OCMOH, 2012, Parfitt, 2011). In 2014, the Council of Canadian Academies released "*Environmental Impacts of Shale Gas Extraction in Canada*", outlining potential industrial consequences of fracking technologies to human health and the natural world. The CCA report was only one of a number of scientific and/or advocacy documents, many sanctioned by state or provincial governments that urged caution in regulation of new fracking economies (OCMOH, 2012; Wheeler, 2014). Although the study focused on shale gas extraction, the key findings apply to fracking technology as a whole. The study concluded the fracking industry has far outpaced scientific knowledge and impact monitoring in Canada and therefore more information and studies are required before acknowledging Canadian practices as safe (CCA, 2014). Public health affects or environmental contamination may take longer to emerge than the remediation process allows, leaving many of the problems that cannot be directly linked to extraction and transportation infrastructure. With much of the extractive process occurring underground, aesthetically it may be possible to return the land to its original state, but long-term marks of development are harder

to erase. The CCA report, and others like it, should be placed alongside the legislative and regulatory apparatus developed by the provincial government and administered by the Petroleum Branch.

Sustainably Developing Non-Renewables

Moreover, the focus on short-term impacts is at variance with the stated Branch goals of sustainable development. The Petroleum Branch is responsible for guiding industry proponents through the legislative/regulatory process to ensure all necessary criteria is met. *The Oil and Gas Act* is meant to provide a comprehensive outline on the mechanics of safe and efficient fossil fuel development in Manitoba. The main purpose of *The Oil and Gas Act* is to ensure maximum economic gain through efficiency and waste prevention while upholding the principles of sustainable development. In Manitoba, we ostensibly have sustainable oil and gas production. Under *The Act* sustainable development is described, in a very conventional manner, as making decisions that respect and protect the environment while still considering the economic legacy for current and future generations of Manitobans. The focus on sustainability as a governance mechanism is problematic because it weighs environmental protection against monetary needs (Adger et al. 2003; Cashore, 2002; Newel, 2013). When sustainability goals are mixed with economic forecasting, the resulting actions tend to favour the short-term market and place less emphasis on the future society and environment. As Scrase and Sheate (2002) explain "What is good for business or preferred by consumers today is not necessarily compatible with what is good for environmental protection in the long term." The time lapse between decision-making and result creates a false separation between humans and their current environments as well as the environments of future generations, creating an arena where environmentally harmful decision-making can be justified by short-term economic gain (Bridge, 2004; Bridge and Wood,

2010; Huber, 2011). The definition of sustainable development also assumes that the current generation is capable of knowing future conditions and is adept at understanding the long-term consequences of today's actions (Babcicky, 2013; Morrison-Saunders and Fischer, 2006, Wals, 2010). Current analyses of the environmental and public health effects of fracking on Canadian communities calls for further research because not enough is known to classify the technology as safe (CCA, 2014; OCMOH, 2012; Wheeler, 2014). Despite these recommendations, Manitoba's petroleum industry continues to produce oil and emphasis is placed on the government's and industry's ability to reign in economic desire for development enough to 'respect and protect' nature, but still ensuring a profit.

The sustainability focus is further undermined because *The Oil and Gas Act* does not include a social or cultural dimension in their sustainable development definition. Within this frame, oil development does not take into consideration the full spectrum of the wants and needs of affected communities. Social and cultural aspects, such as perceived changes to a 'way of life', vulnerability to the boom and bust cycle, displacement due to pollution, strains on social services from increased population, etc. (Willow, 2014) that fall outside of the economic sphere are not part of the Manitoba Mineral Resources Division. Former Assistant Deputy Minister of Mineral Resources Division of Mineral Resources (now under the Department of Growth, Enterprise and Trade), John Fox, believes the current legislation adequately addresses public concerns: "We think we have very good rules. There are certainly public issues and we want to make sure we have the information that we can assure the public so their concerns are addressed" (quoted in Welch, 2013). Since *The Act* does not have a built in forum for public consultation, the Director of the Branch often makes decisions on behalf of public welfare. For example, in section 114.2 of *The Act* states,

> Where the director is of the opinion that a discharge of pollutants from a battery or gas plant is a hazard to public health or is having or might have a significant adverse effect on the environment, the director may in accordance with the regulations require the operator of the battery or gas plant to take such steps to reduce the discharge of the pollutants as the director considers necessary or advisable. (The Oil and Gas Act, 114.2).

There is little opportunity for the public to directly interact with the oil and gas industry through the Petroleum Branch. The public can access documents such as well location, regulations and acts, and land information on the Branch website, but other information like pollution complaints, details on land leases, and historical well locations are not available. A person can request access to information by contacting the Branch during working hours and paying a fee (The Oil and Gas Act, 15.1). Branch assurances that public concerns are heard and taken into account is not reflected in the definition of sustainable development applied in the legislation for in its public accountability or reporting protocols.

Under *The Oil and Gas Act* both government and industry share the responsibility of sustainable development. In order to minimize negative impacts to the environment and economy, *The Act* calls for conservation practices that are "wise and efficient". This language becomes problematic when the wisest choice is not the most efficient. *The Act* assumes that it is possible to balance economic, social and environmental goals, all while supporting a growing industry. Since economic gain and efficient development can be quantified and have instant gratification, these factors often outweigh decisions with slower, qualitative results like long-term public health and community satisfaction.[4] For example, an academic study looked at how fracking was portrayed during 2010 – 2011 in five different Canadian newspapers – *the National Post* and *the Globe and Mail* from Ontario, *the Leader-Post* from Saskatchewan, *the Chronicle*

[4] Rob Nixon (2011) uses the term 'slow violence' to describe the gradual and therefore under-detected effects of environmental degradation. Nixon explores how slow violence against the environment accumulates into catastrophic consequences that is not easily recognized through capitalist systems of blame.

Herald from Nova Scotia, and *the Winnipeg Free Press* from Manitoba. It was found that *the Winnipeg Free Press* was more likely to report that fracking created jobs and to discuss industry trade-offs in communities, and reported less on water pollution, water usage, uncertain risks, strict regulations and moratorium than the other newspapers (Olive, 2016). As this study suggests, government- and industry-led scientific and technological research is expected to show a balance between improved productivity, efficiency and competitiveness, and 'sustainable development' but as of now, the focus on Manitoba's oil extraction is weighted in favour of economic considerations.

The Oil and Gas Act ostensibly covers the complete lifecycle of a well from the logistics of the beginning of a well proposal through drilling to well abandonment and remediation. The focus of *The Act* is the technicalities of drilling operations and productions. Much of the legislation, or at least its application, is left up to the discretion of the Director, leaving multiple ambiguities around the specifics what is actually technically and administratively required of oil companies when drilling in Manitoba. The Director even decides which information is released to the public, and which information remains confidential (The Oil and Gas Act, Part 13). Although *The Act* does take into account environmental impacts and mitigation strategies for well activities, it is mostly focused on cause-and-effect issues and does not address cumulative or long-term concerns. These types of issues are more complicated and require more time and effort to address, making them unattractive and incompatible to the boom and bust cycle of the oil industry. The health effects of well production are briefly touched upon in the form of worker health and safety, but community social concerns and public health issues are inadequately addressed. By only focusing on short-term, quantitative issues, the oil industry

and the Petroleum Branch are able to shield any negative outcomes of the process outside of the legislative framework.

The Surface Rights Act

The ambiguities that emerge out of the Oil and Gas Act are reinforced by the ownership and tenure regime enforced under the Surface Rights Act. Manitoba implemented surface rights legislation in the 1980's by adapting Saskatchewan's 1968 model (Andrew, 2014). Like *the Oil and Gas Act, the Surface Rights Act* was designed for a pre-hydraulic fracturing industry and is not designed for complex horizontal well designs. In Manitoba, private land is divided into the ownership of Surface Rights and Mineral Rights. When an individual purchases a piece of land in Manitoba they are either buying the rights to the surface, the underlying minerals or both. In many cases, people purchase the Surface Rights, while some other person or corporation owns the Mineral Rights. Since well production requires access to the surface and the minerals, both parties must be involved in drilling decisions. This is where *The Surface Rights Act* comes into play. Under this act, if an oil company wants to produce a well on a piece of land, they must reach a lease agreement between both the surface and mineral owners. Once land rights have been signed over to oil companies, the landowner relinquishes their land rights, at least temporarily, and the oil company has legal access to proceed with installations on the land. *The Surface Rights Act* provides a legal mechanism for acquiring land rights and leases, facilitates payments and compensation, ensures land is maintained, preserved and restored, and mediates conflicts between parties.

While guidelines are set in *The Surface Rights Act*, land lease agreements in Manitoba are usually done privately. In most instances, much like the infamous "land men" operating in

the Marcellus Shale area in the northeastern United States (Eisenberg, 2015; Frehner, 2014; Wilbur, 2012), a representative of the oil company will approach the land owner(s) with a proposed sketch of the well development and compensation the company is willing to pay. It is then up to the landowner to review and fully understand the offer before negotiating and signing to the terms (Surface Rights Guide, 2015). *The Surface Rights Act* provides a guideline of compensation terms, but negotiations are usually done behind closed doors (The Surface Rights Act, 9(b)). The Manitoba Surface Rights Association offers advice to individuals going through the Surface Lease process. Legally, landowners cannot prevent oil companies from accessing their land. Oil companies can access private land through either the landowner's permission or a "Right of Entry" granted by the Surface Rights Board (SRA, 2016). Landowners may not be able to prevent oil companies from accessing their land, but they do have the opportunity to negotiate compensation. To determine a fair deal, the Surface Rights Board recommends researching the outcomes of recently negotiated leases and hearing decisions from the Surface Rights Board, contacting the Surface Rights Association and to use a professional lawyer (SRA, 2016). The Association recommends setting up a Surface Lease in very detailed terms so the oil company only has legal access to specific structures on the land (i.e. a single well, specific roads, etc.). They also suggest that landowners understand the impacts that the operations will have on their land, and negotiate a location that will minimize negative affects on farming, esthetics, access, etc. and recommend that all powerlines and flowlines are buried appropriately (SRA, 2016). Finally, the Surface Rights Association encourages all landowners to place an *indemnity clause* into their surface leases, which legally makes the oil company responsible for their actions on your land (SRA, 2016).

The current structure of Manitoba's surface rights adjudication tips bargaining power towards oil companies. There is a lack of transparency in surface rights leases and land agreements because the lease deals are conducted privately between oil companies and landowners. If a landowner decides they are unsatisfied with their lease, had a bad experience with oil companies on their land, or found out their neighbours are getting a much better deal, they can go to the Surface Rights Board to re-negotiate. However, once an agreement has been signed, the process laid out in the *Surface Rights Act* makes it difficult for landowners to make changes. The lease situation is made more complicated for many landowners because the variabilities associated with the boom and bust cycle of oil economies in Manitoba. Many of the original leases were signed generations ago and include twenty-one year automatic renewal clauses.

As a result, some landowners receive outdated or inadequate compensation amounts that do not reflect the new environmental and spatial effects of fracking technologies (Andrew, 2014). Moreover, the bureaucratic nature of the Surface Rights administration dissuades some landowners from engaging the process designed to protect them. If a landowner chooses to bring their case to the Surface Rights Board, they can expect to face a lengthy and expensive legal battle against oil companies who have professionals on staff specifically dedicated to addressing land claims. Scott Andrew, a member of the Surface Rights Association, a non-profit advocacy group that supports landowners, explains perceived difficulties for landowners before the Board:

> Going to the Surface Rights Boards as a farmer, most of them don't want to spend time in front on an oil company litigator who personally attacks them for days at a time. So there isn't even a venue that is conducive to the landowner to get what they want to get done. Legislation will not support an expert coming in and representing the landowner, yet the oil company can do the same thing. They can hire a litigator, whose whole life is built around arguing. The landowner can hire a lawyer, but they still need to show up and give evidence. It is a very hostile environment. (Andrew, 2014).

As Andrew explains, the cost of bringing an issue to the Surface Rights Board are comparatively much higher for the landowner, and the repercussions are potentially punitive. The private process and community reservations around talking openly about lands deals, coupled with a quasi-legal system that may work against the interests of the landowner create a restrictive situation for Manitoban's looking to re-negotiate oil leases or protect their land rights.

Other Relevant Acts

Although the acts and regulations administered under the Manitoba Petroleum Branch and the Surface Rights Board are the most pertinent legislation to oil activity in Manitoba, there are a few other pieces of related legislation that relate to oil and extraction directly. Much of this relates to the use of water. While the amount of water required per well depends on the geological formation, length of horizontal drilling and number of fractures required, fracking requires a great deal of water, with estimates varying from 5, 000 to 100, 000 cubic meters– per 'frack' in Canada (PSAC, 2016) to 7.5 million to 19 million liters of water over the life time of the well (EPA, 2016). The provincial government controls the allocation and use of water for both domestic and commercial purposes through *The Water Rights Act.* Industrial uses of water are listed as the number four water use priority in Manitoba, falling behind domestic, municipal and agricultural uses (The Water Rights Act, 9). Water use for oil wells falls under this jurisdiction. *The Water Rights Act* requires anyone who wishes to use water for industrial purposes to obtain a water licence except for water withdrawals under 25,000 liters per day (MBCWS, 2015). Because of this clause, the *actual* amount of water being withdrawn in Manitoba is unknown, because only larger withdrawals are licensed. This creates concerns over the cumulative impact of unregulated withdrawal alongside increased demand for agriculture and

industry (MB Water Strategy, 2014). *The Water Rights Act* is subject to conditions laid out in *the Water Resources Conservation Act*, prohibiting the use of water for activities that are not approved by the Lieutenant Governor acting on behalf of the Province (The Water Conservation Act, 2). Water legislation in Manitoba is not specific to the oil industry itself, but acts as a generic guide for water users in Manitoba.

The oil industry in Manitoba uses approximately 500 cubic decameters per year (where one cubic decameter = 0.811 acre feet). This is roughly the annual amount of water used by the town of Souris, Manitoba (not coincidently located in the heart of the oil patch), with a 2011 population of around 1,800 people (MB Water Stewardship, 2013). The water used by the industry is sourced mainly from the Oak Lake Aquifer – an approximately 2000 square kilometer underground fresh water reservoir located between the Assiniboine and Souris River, as well as surface water and recycled water (MB Petroleum Branch, 2015). In 2000, the Manitoba government Water Resource Department created an Oak Lake Aquifer Management Plan (OLAMP), commissioning a technical study of the aquifer and recommending management steps. The aquifer's watershed is considered drought prone, and since the major local industries (agriculture and oil), and the communities rely heavily on this water, sustainable water use was highlighted. The study found that water quality and quantity of the Oak Lake Aquifer were "delicate and in need of protection" (OLAMP, 2000). Concerns over potential pollution from roads, rail lines, pipelines and oil exploration all connected to the oil industry were addressed and suggested that infrastructure could be re-routed around the aquifer and oil activities could be limited. Despite the potentially devastating and irreversible consequences of polluted groundwater, the study concluded that these options were undesirable because "the degree of associated risk was considered to be small relative to the inconvenience and cost of change"

(OLAMP, 2000). In this case, the government of Manitoba decided to wager the economic potential of the oil industry against the risk of an environmental catastrophe. By downplaying the degree of risk associated with industry actions, environmental protection and human health are placed in lower priority than capital gain (Beck, 1992; Edward and Burger, 1990). There have been no further groundwater studies since the OLAMP in 2000, and since then the rate of oil activity in the area has increased dramatically. As the study outcomes suggest, the prevailing notion that short-term benefits of the oil industry outweigh long-term potential environmental risk continues to favour the growth of provincial oil economies.

Equally, there are authorities dealing with questions around air quality. Manitoba Conservation and Water Stewardship's Environmental Programs and Services Department addresses air quality and water use concerns from oil operations. As mentioned earlier, there is currently no air quality legislation for oil battery emission releases and flaring of natural gas, only guidelines that suggest acceptable levels for human health and the environment, and a spatial demarcation for allowable proximity of houses, people and livestock. Among the many chemicals released during oil production, hydrogen sulphide (H_2S), colloquially known as sour gas, is the most prominent. Manitoba government guidelines state that the one-hour maximum acceptable level for H_2S is 0.011 parts-per-million. These guidelines are modelled after the 1976 Federal-Provincial Committee on Air Pollution from Environment Canada, and the 1985 Federal-Provincial Committee Advisory Committee on Air Quality from Environment Canada (MCWS-EPS, 2005). In comparison, the Alberta Energy Regulator, a provincial department devoted to hydrocarbon development, works directly with oil companies and affected members of the public to identify well sites with high sour gas potential, and has developed Emergency Response Plans and monitors for potential blowouts (AER, 2015). British Columbia's Oil and

Gas Commission, an independent regulatory agency for BC's oil and gas industry, partners with the provincial Ministry of Environment, Ministry of Natural Gas Development, and the oil and gas industry to actively monitor air pollutants as part of the Northeast Air Monitoring Project. The BC Oil and Gas Commission also has its own separate mobile air quality lab that can be deployed to different communities to study and monitor air pollutants from the provincial oil and gas industry (BCOGC, 2016).

There are currently no government documents available to the public regarding the amount of H_2S emitted by the industry in Manitoba. In other words, it appears that the safety of sour gas emissions rests with the self-regulatory power of oil and gas companies and the individual technicians operating release valves at individual batteries.

Manitoba's regulatory system for the oil industry in the province is spread across several pieces of legislation. The *Oil and Gas Production Tax Act* designates responsibility and rates of tax payable by the industry, while the *Crown Disposition Regulation* regulates fees, rental agreements, and land sales for the Crown, and the *Geophysical Regulation* outlines geological requirements for licensing and field operations. These acts, regulations and guidelines are relevant to the environmental and social impacts of the industry. The oil industry has been active in Manitoba since the 1950's, and although the legislation was updated in 2014 and the version before that in 2002, it is meant to manage a radically different industrial context (MB Petroleum Branch, 2015). When oil operations began in the province, the industry worked exclusively with vertical linear wells, instead of the horizontal drilling and hydraulic fracturing techniques common in today's industry, which has created an underground drilling network that is capable of reaching depths and producing oil volumes at a far greater scale than conventional drilling. Due to advancements in technology, fluctuating market demand, and scalar changes to

operational modes and technological development, oil legislation can quickly become outdated. For instance, the *Oil and Gas Act* was last updated in 1994, before the large-scale implementation of horizontal drilling and hydraulic fracturing. The existing legal structure that Manitoba uses for pursuing sustainable development and minimizing ecological damage and social/community concerns are less sophisticated than systems implemented for larger provincial hydrocarbon economies like Alberta or Saskatchewan (AER, 2015; GoSask, 2015). For instance, the Manitoba *Oil and Gas Act* and the *Drilling and Production Legislation* are modelled after the 1960's regulations from the government of Saskatchewan (Andrew, 2014; Arnason, 2013). Since then, Saskatchewan's regulations have been updated to accommodate drilling trends in the southeastern portion of the province which has similar geology to southwestern Manitoba, while Manitoba's legislative progress has lagged behind (GoSask, 2015). Legislative updates have been promised, as in Manitoba Conservation and Water Stewardship's 2014 "Tomorrow Now" proposal to include the oil and gas industry under the *Environment Act*, but until concrete timelines are put into place, the Petroleum Branch remains the overarching legal and administrative authority for the industry.

Conclusion

There has been massive technological and scalar change in the oil industry, but the acts and regulations enacted by the Petroleum Branch have not been updated to reflect parallel management procedures. They remain more appropriate for the conventional vertical drilling operations of the past. The regulations enforced by the Petroleum Branch are mainly encouraging to oil companies, and requirements to obtain a licence to drill are less stringent than in other provinces. For example, in Quebec and several other jurisdictions in Canada there is a moratorium on fracking due to the ambivalent public opinion of the technology and government

concerns about the safety of the technology (Vendeville, 2014). Newfoundland and Labrador also has a moratorium on all fracking activities until an independent review panel appointed by the Provincial Minister of Natural Resources can compile a full geological assessment and public consultation (NLHFRP, 2016). In Alberta, not exactly known as a paragon of environmental enforcement, the oil and gas industry is regulated under numerous branches with specialized acts and regulations that claim to promote social, environmental and economic sustainable development. Companies interested in drilling in Alberta must consult and comply with the *Alberta Oil Sands Conservation Act,* the *Energy Resources Conservation Board*, *Alberta Environment Department, Alberta Sustainable Resources Development Department,* the *Environmental Appeals Board,* the *Oil Sands Sustainable Development Secretariat,* and the *Alberta Land Stewardship Act* in order to obtain a drilling licence. In Manitoba, oil and gas development is solely governed under the Manitoba Petroleum Branch, relying on the *Oil and Gas Act,* the *Surface Rights Act,* and *Drilling and Production Regulations* to ensure that the environment and communities are adequately protected.

Larry Maguire, Progressive Conservative MLA for the Virden area agreed in a 2013 interview that Manitoba has fallen behind its neighbours in environmental protection: "We need to look to other jurisdictions as to the type of programming and management that they've put in place" (quoted in Arnason, 2013). As Maguire has it, Manitoba's current oil and gas legislation is much less stringent than provinces and states extracting from the same formation. Importantly, the local oil industry does not fall under the Manitoba *Environment Act,* meaning companies are not required to do a formal environmental impact assessment, even for individual installations. This leaves requirements for baseline social and ecological studies, community consultation and mitigation plans for their proposed development by the wayside (MB Conservation, 2014).

Whether it is intended or not, the current legislation in Manitoba is attractive to prospective and active drilling operations, creating the legislative conditions that add fuel to the development fire.

Manitoba's oil legislation remains superficial with a focus on technology and economics. Despite the history of the industry in the province, the legal requirements enacted by legislators or enforced by provincial regulators could be characterized as immature. While other provinces have organized multidisciplinary government networks that ensure governance coverage across many areas of concern, Manitoba relies heavily on the Petroleum Branch to monitor drilling. This raises important questions of why this might be the case: what governance work does this legislative immaturity accomplish? Carlyle Jorgenson, in his capacity as Vice-President of the Surface Rights Association, explains his understanding of the grey areas created by the all-encompassing governance structure of the Petroleum Branch: "The oil companies do try to operate within the regulations, to a point. I had a Petroleum Branch inspector tell me that's correct. Enforcement should be a completely separate division […] it's impossible to promote and enforce out of the same office" (quoted in Arnason, 2013). As Jorgenson reveals, the many roles of the Petroleum Branch are often in direct conflict, creating an irreconcilable tension between expanding industry and protecting those affected by it. With the focus more on production than protection, people who live alongside the Manitoba oil industry are adversely affected by a governance system that is struggling to balance development with sustainability, with potential compromises in both directives.

Chapter 3- Environmentality and the Making of Manitoba's Oil Cultures

My aim in this chapter is to explain how southwestern Manitoba's oil industry is regulated and legislation through a neoliberal framework. I adapt the terms 'governmentality' and 'environmentality' to gain a deeper understanding of how neoliberal values are both embedded in the acts and regulations of the Manitoba Petroleum Branch as well as productive of new resource space. Using the concept of 'governmentality', originally articulated by Michel Foucault, I explore how the province's oil activities are influenced not only by the regulators at the Petroleum Branch but also by the broader political economy of global and local industry influences, public concerns and technological developments. I use the term 'environmentality' to apply Foucault's concept of 'governmentality' to the social order of nature, in this case oil extraction in Manitoba.

I challenge the hegemonic view of natural resources as an apolitical exercise of anthropogenic collection of goods and services from the earth, by exploring meanings of space. I uncover meaningful networks linking people, place and the environment to southwestern Manitoba's oil field. I examine the dichotomy of the predominant industry health, safety and environment (HSE) culture and challenge corporate conservation as an opportunity of scale. Through my investigation I have tried to pull back layers of political, ecological, cultural and economic meanings behind oil governance in Manitoba, suggesting that the industry here is thought about differently than in other jurisdictions. By applying a neoliberal frame to my analysis, I address the discourse used to justify the commodification of nature for oil production. By understanding the language of oil in southwestern Manitoba, thought patterns, dominant discourses and justifications are revealed.

Manitoba's '*Dirty*' Little Secret

To date, there has been little academic attention paid to the oil industry in Manitoba, at least in social sciences (though see, Chen et al. 2009; Jiang et al. 2001; Osadetz et al. 1992; Requejo et al. 1992). Most of the information available is from media sources like newspaper articles and brief reports from the Winnipeg Free Press, the Brandon Sun, and the local affiliate of the Canadian Broadcasting Corporation (CBC). A few local non-government organizations like the Manitoba Eco-Network and the Manitoba Water Caucus have examined oil activity in the area, through their analyses are fairly broad, and focused more on explaining the basic science, technological interventions and environmental concerns of fracking than on critical political ecological analysis. Recently there has been more attention on the southwestern corner's activities because oil prices have reached a five year low, drawing some curiosity and questions about the longevity of the local industry. The dearth of academic work on Manitoba's oil regime can be contrasted to the international arena where, especially in recent years, we have witnessed an explosion of work on fracking, especially from an economic, engineering and geological perspective (see, for example, Fitzgerald, 2012; Gilje et al. 2015; Handren and Palish, 209; Palish et al, 2007; Yethiraj and Striolo, 2013). This literature boon has had less focused attention on the socio-political, public health and ecological concerns of fracking on communities, but this gap has also been closing alongside growing interest in America's "Shale Gas Revolution" (Stevens, 2012).

From a geological perspective, southwestern Manitoba is an interesting test case because it is often claimed by the Petroleum Branch and industry representatives that the geological structure and stratification of this corner of Manitoba is different than other areas of Canada and the United States (Martiniuk, 1988; Osadetz et al. 1992). The geological characteristics prevalent

in southwest Manitoba, in particular the large amount of bedrock between the water table and the oil reserves, enable the conditions which allow for 'safer' fracking (Allan, 2014; Colin, 2014; Enbridge, 2014; Ernst, 2013; Welch, 2013). In effect, a perception of geological scale that emphasizes separation and distance is used to create the appearance of safety (cf. Braun, 2000; Wainwright and Robertson, 2003).

From a political ecological and human geography perspective it offers the opportunity for insights into how communities and individuals perceive, adapt and react to the oil industry in southwestern Manitoba. The way people relate to natural resources is complex and layered with meanings about space and place. In this chapter, I draw on existing social theory that treats human-environment relationships as undividable (Agrawal, 2005; Bridge, 2010a; Bridge, 2010b; Castree and Braun, 1998; Castree 2003, 2008; Foucault, 1997; Harvey, 2005) alongside case studies, grey material, legislation, interviews and field observations to understand what oil extraction means to communities in southwestern Manitoba.

When exploring the effects of natural resource extraction on a community, extraction history, political attitudes, local ecological conditions, social demographics, culture and biophysical environments must be taken into account. Even then, it is exceedingly difficult to encompass all individual perspectives and experiences that a community has towards extraction because the human/nature relationship is saturated with personal meaning, reflecting individual perception of place (Cresswell, 2014). Yet it remains clear that nature is not an apolitical arena for human life, it is a dynamic place where people connect to values, emotions and self-identity (Ardoin, 2006; Bender, 2006; Brehm et al. 2006; Cheng et al. 2003, Davenport and Anderson, 2005; Farnum et al. 2005; Reed and Bruyneel, 2010; Rogan et al. 2005). People develop deep connections with nature, forming meaningful relationships with the environment and

interconnected communities. Individual positionality determined by personal identity at particular times and places will greatly influence one's ideas or beliefs about resource extraction. The people-place connection becomes hard to define because explanations of meaning are deeply personal. This strong sense of place powers social interaction with nature, influencing natural resource extraction and policies. Through this lens, and with these obstacles firmly in mind, I examine what fracking means to people of Manitoba and how those meanings are governed, influenced and processed though state regulatory and corporate structures. My analysis considers the making of Manitoba's oil cultures both in Winnipeg, the provincial capital, and in the rural communities more directly involved in the process of extraction.

Environmentality on the Prairie: Governing Southwestern Manitoba's Oil Industry

Social relations with the natural world are regulated at a deeper level than what is enforced by the law. This legislative and administrative context does not operate in a vacuum. Interactions with nature are influenced by dominant hegemonic beliefs that are deeply rooted in societal norms that prioritize the economy over the environment (Braun, 2008; Castree and Braun, 1998; Demeritt, 2002; Willems-Braun, 1997). French social theorist Michel Foucault deployed the term 'governmentality' to describe what he called the 'conduct of conduct' or the deliberate direction of individual behaviours to meet the needs of governing policies and hierarchies:

> I have then tried to sketch out a bit this notion of government, which seemed to me to be much more operational than the notion of power, 'government' being understood, of course, not in the narrow and current sense of the supreme instance of executive and administrative decision in State systems, but in the broad sense, and old sense moreover, of mechanisms and procedures intended to conduct men, to direct their conduct, to conduct their conduct (Foucault, 1979-1980).

As Foucault describes, governmentality emphasizes specific discursive techniques and develops programs that state institutions use to build and achieve their political goals. These techniques can include the use of education, persuasion, inducement, management, incitement, motivation and encouragement to govern specific domains and to induce particular forms of social behaviour (MacKinnon, 2000; Dean, 2009).

Governance technologies work to create or legitimize a reality that is stable and predictable, allowing the state to successfully intervene to achieve political goals through the exercise of power, manipulation and suggestion. In this section I will explore different ways governmentality is woven through the oil industry in southwestern Manitoba and use Arun Agrawal's (2005) related concept of environmentality – the creation of willing environmental subjects to secure the governance in Manitoba's oil industry (see also, Luke, 1995; Birkenholtz, 2009; Peyton and Franks, 2016).

The tactics of governmentality can be subtle, such as the normalisation of preferred behaviours, or aggressive, like legal regulation or even outright force. However the practice of governmentality is conducted, there is always a distinction between the state-sanctioned experts who do the work of governing and the subjects who need to be governed (Li, 2007). Governmentality is used to fashion ordered populations that are manageable by political bodies (MacKinnon, 2000; Dean, 2009). Governmentality draws on different forms of rule, such as disciplinary measures and the internalisation of social norms and discourse to mould a society where government sanctioned behaviours are encouraged and consolidated (Florini and Sovacool, 2009; Foucault, 1991; McCarthy, 2005). Through the operation of governmentality we are shown how to act, think and behave in order to prevent disorder, to incentivize prosperity and to suppress difference.

Citizens are aware that there are not enough police or government employees to watch and judge the actions of every individual at all times. Therefore, the consequences of breaking social or legal codes act as a type of discursive surveillance camera. People are encouraged to self-regulate their behaviours to conform to institutional guidelines, not because of personal altruism but because of the constant reminders that someone might be watching (Agrawal, 2005). In order for this type of regulation to be successful, individuals must internalize their roles as subjects to a higher authority, and work together to create an atmosphere where preordained inappropriate actions lead to disciplinary measures. In many cases, the idea of breaking social code is enough to effect self-regulation, but to ensure a higher compliance rate, citizen policing of the self and others is encouraged. Through this form of governmentality, rules are absorbed into our everyday lifestyles, making it possible to exercise a level of control over the movements of the masses (Foucault 1997, 1991).

Governmentality works through the deployment of specific techniques that work on different layers of society to influence the action of the populace. One of these techniques is the use of discourse. Foucault explains discourse as the interpretation of language which privileges certain ways of thinking over others (1991). Through selection, emphasis, presentation and repetition of certain ideas, specific epistemologies are heard while others are actively silenced. Discourse dictates which ideas matter most in certain circumstances and which actions are considered appropriate (Mercer et al. 2014). On a grander scale, frameworks of particular ideologies are upheld through discourse, actions and practices (Mercer et al. 2014). Through the use of language, or discourse, the oil industry for example is able to reframe human needs and desires to parallel those of the market. Metalogics and discourse do not exactly change our opinions on certain topics, but create a framework through which we process information.

Discursive Regimes of Power: Thinking about Manitoban Oil

Part of the challenge of developing an analysis within the framework of governmentality is to differentiate the nature of power and discourse across space. Indeed that is part of its appeal for many researchers. Discourse surrounding the oil industry in Manitoba varies considerably across the province, but there seems to be two broad currents of thought defined by geography and social location. The first discourse comes from within the oilfield in southwestern Manitoba. Extraction is presented by the industry and government in this area mostly in terms of wealth accumulation and community futures. Ken, from TSL – a locally run oil field trucking company – explains the economics of the local industry: "When I came out here and started doing this [work at TSL], it was a change, but it was a change for the good as far as I am concerned. I enjoy it. It brings huge growth and revenue to all these small communities out here. We draw workers from this main area and the growth goes back here" (Ken, 2014). The idea that the oil industry is a positive benefit to the local community because it brings direct and indirect economic opportunities was mentioned in every interview conducted. The possibility of economic benefits from oil extraction is not under dispute, at least in the short term, but this ubiquity of this fame deserves critical attention. Colin, who grew up in Virden and now works in the oil fields explains his view of the industry as one bounded to notions of place, opportunity and resource history:

> "I think a lot of it comes down to everybody understanding where their bread is buttered. When you look at the oil patch in town it indirectly or directly impacts easily 90% of people here. Whether it is building a hockey rink or funding a sports dinner, I think in a sense because we are such an oil town, it gets overlooked. When an industry comes to town and we don't feel the direct benefits, then probably guys tend to shy away. For the most part we don't have any new industry, it's either agriculture or oil. Actually the first oil well in Manitoba was drilled here. It's a huge part of our history. (Colin, 2014).

As both interviewees said, the oil industry in southwestern Manitoba is often framed as a benefit to communities because of economic growth. Despite this overwhelmingly strong discourse about the industry in this corner of the province, conversations about the oil industry outside of the southwestern oil boom are uncommon.

The second discursive regime is one of relative silence. There is a lack of dialogue about the industry directly outside of the oil fields. This is actually a discursive absence. Details of the provincial oil field only reach the rest of the province when metropolitan news channels pick up on major industry events. Winnipeg, the centre of provincial news media, is located approximately 300 kilometers from Virden, the epicenter of the oil field. As Ed, Virden's Economic Development Manager explains: "The oil industry does not affect Winnipeg. There is less awareness, and with that there is less concern" (Ed, 2014). Megan, the Water Caucus Program Manager for the Winnipeg based non-government organization *The Manitoba Eco-Network*, explains her knowledge of the provincial oil industry: "I don't know enough about fracking in other places, and to be honest I don't know very much about fracking in Manitoba. I don't think there is a clear number out there of how many wells there are in Manitoba, I just know that they are increasing" (Megan, 2014). The province of Manitoba appears to be divided in the way that people think, talk and interact with the oil industry.

The majority of people located within the oil field are familiar with the industry and see the benefits that natural resource extraction has on their communities. Manitobans outside of the oil field have less of an awareness about the specifics of the industry, and are perhaps less likely to form an opinion beyond a more general normative assessment of extraction. The apparent lack of knowledge of the provincial industry outside of the immediate extraction area has created an atmosphere of little political and social resistance.

In more recent publications, Foucault's ideas of governmentality have been applied to the relationship between humans and the natural world. Nature here is not an apolitical backdrop but a biophysical actor able to influence governance and ideology. The natural world has been assigned economic, political and social meaning, affecting the way we think about and regulate natural resources (Cheng et al. 2003). At the leading edge of this turn, Arun Agrawal (2005) has developed the notion of "environmentality" – a greening of Foucault's term "governmentality", to describe the creation of environmental subjects and the governance of nature. Agrawal studies the progression of environmental concern, noting that one's connection to nature is rooted not only in formal regulation but in social structure location and personal experiences.

As natural resource extraction rates increase, concerns about environmental protection emerge and gain traction. Environmentality denotes a framework where governing technologies influence practice and imagination to produce subjects that are concerned about the environment, though often in particular ways that code environmental interventions along a spectrum of value, as 'good' or 'bad'. Environmentality asks questions about how members of a society come to think, act and ultimately care about the environment. Agrawal tackles the dichotomous identities of natural resources; how the environment is thought about both materially as a means to produce capital *and* conceptually as a sphere that must be protected. His studies of environmentality, in his case in India, focus on how populations come to know nature and which social, economic and political forces influence their stance on extraction and conservation. As capitalist society becomes more politically motivated to protect the environment, technologies used to govern populations encourage the internalization of the ideas of sustainability (not to mention resilience and wellbeing, and so on) so actions reflect environmental regulations. These governance aspects roundly favour the goals of the state. The relationship between governor and

subject becomes more distinct as the government dictates how citizens should interact with nature (Agarwal, 2005; Castree and Braun, 1998; Fletcher, 2010).

Corporate Bodies: Governing Health, Safety and Environment in Manitoba's Oil Industry

The oil industry in southwestern Manitoba employs Health, Safety and Environment (HSE) external government and internal corporate policies to quantify, govern and protect the bodies of the workers in the oil patch. Colin, in his capacity as an employee at Bakker Hughes, an oilfield servicing company in Virden explains the HSE culture at his job:

> In order to start with us [Bakker Hughes] you get sent for a two-week training course right off the bat. You get in and you go straight to Calgary. You do one week right off the bat and then another week a month later. It's basically the same thing, trying to make sure people understand the [HSE] culture. In a big company there are so many policies, but the policies are there to ensure your safety. It's not like they are just checking a box, they want you to go home. Our HSE is quite important to us. (Colin, 2014).

As Colin and many other oilfield workers I interviewed explained to me, the emphasis on HSE culture and education by their employers is very strong.

Any infractions to the HSE policies leads to serious discipline. Although HSE education targets the individual, companies calculate the effectiveness of their HSE through quantitative statistics and declarations. For example, Enbridge – a multinational pipeline company with several installations in southwestern Manitoba – describes their HSE accomplishments in their 2013 Operation Reliability Report:

> Our team has spent more than 160,000 hours in 2013 building safety knowledge and skills. Over the past seven years, we've quadrupled the average number of environment, health and safety training hours per employee and increased the total number of environment, health and safety training hours by more than six times. (Enbridge, 2013).

As the statement by Enbridge exemplifies, the number of injuries, fatalities and environmental incidents (or lack thereof) are quantified to promote the company as one that cares deeply about

its HSE program. The detail of the events and the people affected are replaced by numbers used to set goals and show compliance. The reliance on the individual to preform according to HSE policy aligns with the notion of managing individual bodies to achieve governance goals.

The strong HSE culture in the oil industry in southwestern Manitoba creates a paradox, because on one hand, health, safety and the environment are promoted in a more aggressive manner than has ever been seen before in the industry here. This has obvious benefits for workers in resource industries. An employee of a local oil field servicing company in Virden, Manitoba explains her confidence in the industry's ability to protect the environment:

> There is so much more environmental [sic] involved in the oil industry now. Like they are really good at reclamation now, so I don't think it is as big of a concern as it would have been in the last oil boom. Technology has improved so much, it is better. I think everything does have an impact, but I would just hope that everyone is doing their due diligence and it gets put back as best as it can and that it doesn't make too much of a difference. (Anonymous, 2014).

As this person explains, the responsibility is placed on and is assumed by both the companies and the individual workers to make the best effort to prevent environmental damage.

On the other hand, there is a growing number of reports showing major concerns about the affects that fracking has on health and environment (CCA, 2014; McKenzie et al, 2012; Prud'Homme, 2014; OCMOH, 2012; Osbourn et al. 2011; Wilbur, 2012; Wood et al. 2011). This divide can be thought of as an issue of scale. The industry led HSE culture focuses on the individual worker, making sure that their daily activities keep them and their immediate environment safe. The emphasis of responsibility is on the individual worker, rather than the collective community (Flint and Luloff, 2005; McEwan and Goodman, 2010; Sica, 2013). Conversely, the major concerns that are being addressed by media and academic sources tend to look at the cumulative impacts of drilling operations on community health and the environment in both the long- and short-term. While the individual worker may be directly protected from the

chemicals and machinery they are using through corporate HSE policies, the larger concern is over how the diverse community – men, women, children, the elderly and those with weakened immunities – may be affected by many well sites releasing low concentrations of chemicals and hydrocarbons into the air, water and soil over time. These longer-term concerns are abstracted by the HSE focus.

Despite the increasingly well-known controversy surrounding fracking, the strong HSE culture in southwestern Manitoba has instilled confidence in many members of the community, while abstracting the long-term environmental, health and social concerns and reframing the notion of community health in the oil patch. My point is not to discredit or critique HSE culture, as it has played an important role in ensuring worker safety and environmental awareness, but rather to analyze the administrative or governmentality work done in and through its implementation, as well as other forms of rule.

Neoliberal Governance in Manitoba's Oil Industry

The concepts and behaviours embedded in governmentality are being used to exploit southwestern Manitoba's natural environment to justify profit-maximizing extraction. The Petroleum Branch in conjunction with the oil industry have created a governance regime which relies on a competitive free market to dictate actions. With economic goals at the forefront, neoliberal economic visions dictate the role of the industry on its endless search for capital accumulation, the rolling back of the traditional government regulation to rely on market indications, and the role of the community as watchdogs to keep the industry in line with their values.

The neoliberal capitalist framework engages the tactics of governmentality to enable governments and its administrators to emphasize neoliberal policies with the end goal of

producing efficient and competitive economies and market-centric societies (Harvey, 2005; Holifield, 2004; Larner, 2006; Mackinnon, 2000 Peck, 2004; Robertson, 2004). Under neoliberalism the welfare state and its social provisions are essentially restructured to promote an atmosphere that encourages competitiveness and entrepreneurial vision through the free market. It is a way of reorganizing social and economic relations for capital accumulation. By upholding a theoretical and ideological framework that fosters neoliberal standards of turning nature into profit, the state is essentially able to reform policy to promote the economy at the expense of other relations (Larner, 2006). Through this framework individuals are viewed as self-interested autonomous actors who make decisions to prioritize economic gain (Fletcher, 2010). Neoliberal governments manage the population through market governance, encouraging individuals to adopt the rules of the market into their daily lives (Larner, 2006). In this section, I engage this framework to examine the ways the government of Manitoba (mainly through the Petroleum Branch), the industry and the community interact with each other, filling the essential roles needed for a well-functioning neoliberal extractive society.

In recent years, Manitoba's oil economy has ramped up with the introduction of hydraulic fracturing and horizontal drilling. Following the increase in drilling and the growing interest of global corporate investment in the southwestern corner of the province, more people are coming to work in the area. This means more people, actions and sites of politics and economy to govern than ever before. Jeff McConnell, the Mayor of Virden, the town at the heart of the province's oil boom, explains the dynamics of stability in the oil industry in Manitoba:

> We are not a big producer, however we are significant enough and our product is easy enough to get to and it's easy to refine. It's not like the tar sands scenario where they have a whole lot of other processes. The stuff that comes out of here is nice sweet crude, as I understand it. All those things combined tell us it's going to be here for a while. Plus, even though the price of oil went up to one hundred dollars, four or five years ago, the larger producers in Manitoba are

> smart enough to know that the price fluctuates and they set up their ten year plan based on global events. (McConnell, 2014).

As the Mayor explains, the combination of technologies, geologies and economies has cultivated a strong oil industry in Manitoba. “Strength” here is framed as a bulwark against the inherent volatility of the oil industry. Moreover, the very nature (i.e. the biophysical structure of the resource) is framed as viable for extraction. But we might also ask questions about the role of politics and bureaucratic structures (regulations, assessments, administration, taxation, etc.) in the growth of the industry.

Neoliberal policies are often presented as apolitical or neutral because of the reliance on the market to guide the actions of individuals. This is the ‘common sense’ quality so often appealed to by markets proponents. Since governments are not supposed to directly influence the market, proponents of neoliberal policies claim that the market provides an impartial outlet for distributing the benefits and costs associated with capitalism and resource extraction (Fletcher, 2010; Harvey, 2005). The focus of the neoliberal economic remodelling is to create an atmosphere where capitalism thrives. Through this frame, everything becomes defined in economic terms. This narrow framework suppresses all other ways of knowing, limiting policies and our ability to react. Castree (2008) argues that relying on the market to allocate essential life (in this case oil, the people who extract it, the ecosystems that it comes out of) resources is actually a very political exercise. He explains that neoliberal governance is more than an economic exercise but a social, environmental and geographic project, each dimension with its own political consequences.

Neoliberalism is social because it redefines individual relations with the state, the community and the natural world to match market logic. These relationships shape the way we live, putting emphasis on the accumulation of capital. Relying on the market to allocate the

"goods" and "bads" of capitalism is also a social justice issue, since the benefits of capital accumulation are intrinsically connected to one's social status. Neoliberal reform changes the way humans interact with one another, redefining relationships into transactions.

Neoliberalism is also an environmental project because it commodifies the natural world (Castree, 2003). By viewing nature as natural resources, other biophysical and social values are subordinated unless they can be presented as a business opportunity – one might argue that ecosystem services or the concept of sustainability fits within this frame (Dempsey et al. 2011; Redclift and Woodgate, 2000; Robertson, 2006). This shift in environmental awareness has dramatically changed the way humans interact with the environment, placing human social and economic relations ahead of nature.

Finally, neoliberal ideology is a geographic project because capitalism is experienced on a multitude of scales, influencing global politics all the way down to local government. Regardless of localized dominant hegemonic beliefs, the underlying current of capital accumulation guides the management and development actions of communities under neoliberalism (Kurtz, 2003; MacKinnon, 2010; MacLeod and Goodwin, 1999; Marston, 2000; Marston et al. 2005).

We can apply this analysis of neoliberal governance to the Manitoba government and the creation of a petroleum industry driven primarily by economic motives. The focus is on attracting big oil operations to the province to develop the industry. In a sense, this is an obvious statement, but it bears closer inspection. Within the neoliberal optic, a close relationship between the state regulatory bodies, in this case the Petroleum Branch, and industrial/corporate proponents is necessary to foster a competitive system that focuses on maximizing profits through resource development and the application of a market logic. The government is

responsible for creating the (neoliberal) framework through legislation and regulations. It is then up to industry and communities to fill in the gaps created when the government rolls back responsibilities essential for social wellbeing with corporate policies and community programs. The industry's use of subcontractors to divide the work amongst many smaller niche companies also muddles the roles of responsibilities and accountability. These three divisions – government regulators, industry and the public – are often presented as clearly defined categories but in reality the borders are muddled with constantly shifting grey areas of considerable ideological and governance overlap (Garvin, 2001).

In southwestern Manitoba these roles are further complicated because the complex relational dynamics of the small, tightly-knit communities often means that individuals embody multiple and sometimes conflicting roles (Flint and Luloff, 2005), and social relations are freighted with meaning and history. In this sense the personal really could be political. For example, government regulators are often hired from within the community, with years of experience working in the oil industry and possibly having vested interests in the nature of regulation. Locals have grown up knowing the industry intimately, their lifestyles adapting to the boom and bust cycles of drilling. The industry has directly and indirectly provided employment to the majority of the community and dotted the otherwise agricultural landscape with drilling rigs. It is common for people to work for oil companies during peak times and return to farming when the drilling slows down. Since both agriculture and drilling rely heavily on differing manifestations of the environment, these two industries are constantly vying for resources – particularly land, water and workers. The oil industry blurs both physical and epistemological boundaries as the area between industry, community and regulator bleed together through a neoliberal economic lens.

Proponents of capitalism are able to harness the economic potential of the Earth's materials in exchange for financial accumulation (Mackinnon, 2000; Fletcher, 200; Castree, 2003; Castree, 2008). In the process of commodification, nature is first privatized through the social concept of land ownership and then divided and bought by individuals, corporations and the state. The privatization of natural resources allows for capital accumulation by selling or leasing valued commodities to developers for extraction (Mansfield, 2004). No longer are natural elements like air, water and land thought of as public commons, but rather as private property that can be marketed however the owner sees fit. Through the privatization of nature, land becomes divided, mapped, reimagined and made "legible" according to resource potential, and all social, historical and ecological roles the land plays becomes secondary (Scott, 1999). In effect, new "treasure maps" (Bridge, 2001) are drawn to show the way to resources.

Another key characteristic of neoliberalism is the shift from local government to local governance (Harvey, 2005; Mackinnon, 2000). Although the neoliberal government steps back from direct ruling through regulation, it does not mean that there is less influence on behaviours. In terms of natural resources, this means more emphasis is put on individual companies and their employees to self-regulate the consequences their actions are having on the environment (see, for instance, the emphasis on HSE in the previous section). This is usually done through an internal Environmental Management System (EMS) that includes scheduled internal audits and inspections. The collection and storage of this information compresses natural events into easily defined data points that prove company due diligence to environmental standards. These records are then kept on file and government officials can legally request to see documentation of environmental responsibility. Companies that fail to comply with documentation or safe

environmental practices are disciplined by the government, usually in the form of a monetary fine.

The distancing of the government from regulation has led to both an increase and a decrease in industry environmental standards (Castree, 2008). The stripping back of government regulations has led many companies to augment their own environmental practices to exceed government standards to attract eco-conscious consumers. At the same time, environmental practices that end up having high costs in production and are less obvious to consumers are often pushed to the side. Since most of the reliance is on the proponent to self-regulate, it has become increasingly the role of NGO's and concerned citizens to monitor for problems that may emerge between government visits (Fletcher, 2010; McEwan and Goodman, 2010).

This same dynamic manifests in the energy economies of southwestern Manitoba. Scott Andrew, a local lawyer and a member of the Surface Rights Association (SRA), explains the need for his local SRA:

> I am part of the SRA. We are the advocates for landowner rights. There is a Surface Rights Board which is appointed by the government. The Surface Rights Legislation in Manitoba was adopted in the 1980's, which came out of Saskatchewan's 1968 legislation. It is outdated, it is bad legislation. Unfortunately, a good board can do a lot with bad legislation, but a bad board and bad legislation is just bad. That is why we have the SRA. (Andrew, 2014).

As Andrew explains, his NGO has become the de facto social and environmental watchdog, monitoring the oil industry's legal interactions with the public to ensure landowners are not being taken advantage of. This extra-legal monitoring and advocacy is perceived to be necessary because under the neoliberal managerial regime it makes sense to treat the environment as profit maximizing natural resources. Community members are required to take on more responsibility

to hold the industry accountable to local social and environmental concerns, often volunteering their time to protect both public commons and private resources adjacent to extractive sites.

In southwestern Manitoba, government at a distance means more reliance on industry accountability, compliance and transparency. The Manitoba Petroleum Branch relies on oil companies to operate according to their policies and regulations. The Branch uses a combination of auditing, inspections and good faith to ensure compliance with their environmental standards. However, there are currently only three government petroleum inspectors and as one of those inspectors, Allan explains, the demand for their attention is growing: "We are less staffed than in 1991, when I started and there is probably ten times as many oil and gas facilities than then. So that presents a challenge in house for us *in the way we do business.* But we have a very strict mandate on what to do and how to proceed in oil and gas activities." (Allan, 2014, emphasis added). The way we do business is, of course, 'just' an expression. But, as a discursive mode, it illustrates a particular emphasis of the Petroleum Branch. As Allan suggests, the notion of government inspections is thought of as a business transaction, bolstering a neoliberal economic framework, and the 'strict mandate' he describes circumscribes how the regulator can interact or influence the industrial process.

Furthermore, the low number of inspectors belies the importance of the role of the Petroleum Branch in Manitoba, as I discuss in greater detail in the following chapter. This regulatory body acts as a one-stop-shop for any and all things associated with drilling. Unlike other provinces like Alberta and British Columbia, where duties are delegated amongst multiple government branches, oil and gas activity falls exclusively under the Petroleum Branch's jurisdiction. For example, consider the investment recently announced by Manitoba-based Tundra Oil and Gas Limited (a subsidiary of James Richardson & Sons, Limited) to add an

additional 530 oil wells to their southwestern Manitoba roster in 2014, with a further plan to spend $70 million on expanding their drilling area by 12,000 acres in 2015 (Globenewswire, 2014). The number of wells drilled keeps expanding (because the return on investment is so strong), but the Branch's staff remains the same size. This requires a large amount of trust to be placed on oil companies to comply with best practices at the heart of their operations. As discussed, there are clear operating guidelines within the *Manitoba Oil and Gas Act* and *Drilling and Production Regulations* that outline how companies must legally function, but since site visits from government inspectors are occurring with less frequency, the Petroleum Branch must rely on corporate paperwork and documents as well as the public as watchdogs to ensure best industry practices when inspectors are not able to inspect all installations regularly.

The public can also play a role in governing oil companies because company reputation and community relations are important for running a successful operation. Although many of the oil wells are situated on people's properties and near roads and towns, the riskiest activities, like horizontal drilling, hydraulic fracturing and transporting oil through pipelines occur underground and outside of any conventional visible frame. In order to keep up a positive image, many oil companies go above and beyond the health, safety and environmental standards required by the Petroleum Branch and are aiming to project the image of the good corporate neighbour in the community. Companies are doing this by putting resources into education and welfare in the community, a social vacuum (perhaps abetted by neoliberal deregulation of many social services) being filled by corporate social capital and philanthropic investments/endeavours.

All of the companies that I interviewed had active Corporate Social Responsibility (CSR) campaigns, allowing them to fund projects in the community, raise visibility and promote their own social capital. In many instances, these communities likely would not have had access to the

same opportunities without donations from the oil industry because of limited public funding for communities in municipal and provincial coffers. For example, in the town of Virden, many of the oil companies active in the area have pooled together funds to build Tundra Oil and Gas Place. This brand new community recreation center houses a hockey arena, gyms, and the local junior hockey franchise, the Virden Oil Capitals, a name that shows the deep historical underpinnings of oil cultures in public life in the area. The name "Tundra Oil and Gas Place" was awarded to the company with the largest donation – Tundra Oil and Gas – while smaller sponsorships are awarded with their company names on banners, plaques and signs around the rink, even painted into the ice.

The ostensibly altruistic intention of these donations becomes more opaque when oil companies sponsor programs in which they have a vested interest. For example, the West Souris River Conservation District, an NGO in Reston, Manitoba that aims to protect the environment from negative industry impacts in the area, including fracking, has a youth education program that is sponsored by the same drilling company, Tundra Oil and Gas – see Figure 8 (WSRCD, 2012).

Figure 8: "Environmental Education Programs Sponsored by Tundra Oil & Gas Partnership" - Sign posted outside the West Souris River Conservation District Office in Reston, Manitoba
(K.Hlushko 2014)

Oil and gas companies often invest resources into education programs, which might raise questions about how educational resources and experiences are framed (i.e. what is included, what is left out and how the industry is positioned alongside environmental, social and economic relations in the area). As EOG Resources, an oil outfit with operations in southwestern Manitoba, states on their corporate website:

> EOG employees can also be found taking community leadership roles. They talk with school children about the oil and gas industry, donate used computers to local classrooms, support rodeos and the arts in small towns and serve on school boards and in numerous other volunteer roles. (EOG Resources Inc., 2015).

When companies enter areas of influence, like school systems, through donations, volunteerism and as board members, there is a potential for a conflict of interest. The presence of industry in schools helps to normalize oil activity in the community, educating young people early on about the role of the industry in society. Through corporate social responsibility programs (CSR), the oil industry sends the message that they care about communities, and are willing to go above and beyond their legal responsibilities to be good neighbours. By highlighting non-fracking corporate activity, the potentially negative consequences the industry has on communities can be balanced. Despite the seemingly generous nature of industry CSR, ulterior motives might be questioned.

The final neoliberal technique that can be identified in southwestern Manitoba's oil fields is the emphasis on privatization of land. In Manitoba, most drilling occurs on private land and is regulated under the *Surface Rights Act*. This creates an interesting dynamic when the owner of the mineral rights leases their rights to the oil companies, leaving the owner of the surface rights with little opportunity to dictate what kinds of actions are undertaken on their land. The valuation of nature through ownership creates an arena for economy-focused natural resource extraction. When land is privatized, the owner has the power to choose the fate of the land, effectively affecting entire ecosystems and communities. Through the neoliberal framework the emphasis on

economic accumulation crowds out other ecological, cultural, social and historical uses of the land, perhaps even including agriculture, trumping other ways of knowing the land. This leads to the epistemological understanding of nature in terms of extraction, limiting sustainability to the short-term confines of profit.

Due to the constantly shifting market platforms and priorities, natural resource extraction is continuously evolving to adapt to competition and the endless search for new technologies (Castree, 2008). Neoliberal policy encourages capital accumulation in the short-term, and many locals, especially those with ambivalent relationships to the oil industry, have intimate knowledge of this often plays out in oppositional terms. Scott Andrew explains how neoliberal policy promotes local oil industry at the expense of other interests:

> It's a $22 billion a year to them [Oil Companies], but the problem that we have between farmers and the oil industry is entirely the regulator in my opinion. If the regulator did a better job, we wouldn't have a problem. The farmers are uptight because they aren't getting what they need. If I was running an oil company I would do it the same way these guys are because the legislation is telling me I can. They are not breaking the rules. I am saying the rules are wrong. (Andrew, 2014).

As Andrew explains, current oil legislation encourages economic growth for the oil industry, in the face of some contradictory environmental regulatory issues.

Conclusion

The governance of oil extraction in southwestern Manitoba extends deeper than the legislation and regulations enforced by the Manitoba Petroleum Branch. This area of the province has a long history of oil extraction, with the bobbing oil rig acting as a cultural symbol of economic pride. Through different techniques of neoliberal governance thoughts, beliefs and attitudes toward local drilling are influenced and brought into the same discursive frame as extractive activity.

In this section I have outlined different techniques of neoliberal governance in southwestern Manitoba that permeate the local oil economy. This list is not exhaustive, as techniques of rule need to be flexible to accommodate the constantly shifting ecological, social, and economic situations. Neoliberal ideals that encourage privatization, economic accumulation, individualism, the rolling back of local government and the corporate provisions of community benefits are deployed in southwestern Manitoba, contributing to the strong and assertive oil culture in the area.

Although there are alternative ways provincial oil extraction is understood, the natural world has been redefined to match neoliberal norms and any epistemological transactions are played out within this hegemonic framework. The creation of environmental subjects through the strong HSE culture of the oil industry has created the illusion of a dialogue that is invested in the health and safety of the local community and environment. Corporate social responsibility programs are put in place to supplement social programming traditionally supplied by the local governments, creating a community-focused reputation for many industry players, who have then perhaps come to exemplify the corporate/community values on the ground.

Finally, more and more responsibility is being off-loaded from government onto industry, non-governmental organizations and the public to keep records and ensure compliance with the rules. Due to the loosening of government intervention, more power has been given to industry to govern their own operations. To be clear, not every action of the oil industry can be regarded as a cold-hearted business transaction, as many concerned individuals exemplify the corporate values being espoused by CSR programming. But it is important to unveil neoliberal values woven throughout the extractive processes to better understand how decision-making is ultimately tied to economic accumulation and a deeply politicized process.

Chapter 4 -Silent Epistemologies: Confessions from Manitoba's Oil Field

As discussed in earlier chapters, there are significant gaps in the regulatory frames which govern the oil industry in Manitoba. These legislative gaps create tangible silences that are reflected in the local communities, industry and environment. These findings have laid the foundation to analyze the field interviews and interactions I collected, to unravel what it means to be a part of Manitoba's oil field, to define the way-of-life. Through my interviews, experiences and research in the area I have pieced together a narrative which shows how people have been guided into thinking about southwest Manitoba. By combining personal stories shared with me through interviews with the legislation, history, and frameworks that influence a sense of place, I develop three frames for thinking about the effects of fracking in southwest Manitoba: fracking as a technical experience, fracking as an environmental experiment, and fracking as a lived experience. These frames help to better understand how oil has shaped the lives of those living in the area.

Fracking as a Technical Experience

The first discursive gap that I will be discussing is the implications of understanding fracking as a predominantly technical experience (Williams et al. 2015; Willow and Wylie, 2014). As discussed in the previous governance chapter, southwestern Manitoba's oil industry is regulated through a neoliberal framework. The industry employs neoliberal techniques in order to uphold the notion that oil extraction is beneficial for communities and safe for the environment (Cruger and Finewood, 2013; Finewood and Stroup, 2012; Hudgins and Poole, 2014). In order to do this, industry proponents and regulators narrow the definition of fracking to the strictly technical and economic acts of horizontal drilling and hydraulic fracturing. This act

of narrowing circumscribes an entire lifespan of different environmental and economic encounters required in the process of fracking a well. These events range from silicon sand mining for inclusion in frack liquid, to the various service industries, to the storage of toxic waste material (Wylie and Albright, 2014) in the aftermath of well closure. I suggest here the narrowing described above produces a myopic frame and a reliance on technical information to justify decision making connected to the oil industry in southwestern Manitoba.

The simple technical explanation of fracking used in mainstream accounts narrows the experience to the physical act of horizontal drilling and hydraulic fracturing: the mechanics of drilling, the construction of well pads, the circulation and disposal of water, the networks of well-service providers, etc (Norris, 2016; Yew and Weng, 2015). The focus on science and technology organizes the industry by separating servicing and production acts from the less politically troublesome acts instead of representing the cumulative lifecycle of the project. Through this lens, the scale of issues assessed is narrowed to what is immediately quantified (Goldman et al, 2011). Acceptable knowledge becomes the data that can be counted. For example, in a section titled "Fracking in Manitoba" on the Tundra Oil and Gas website, general technical information is made available to the public regarding the industry:

> During the hydraulic fracturing process, a mixture of water, sand and other chemical additives designed to protect the integrity of the wellbore and enhance production is pumped under high pressure into the formation to create fractures. The fractures are kept open by sand or "proppant", which provides pathways to allow the natural gas to flow into the wellbore. (Tundra Oil and Gas, 2016).

This quote from their website exhibits the technical narrative that is common when discussing fracking. Interestingly, Tundra Oil and Gas mentions natural gas in this section, when only oil is extracted (or at least produced as a hydrocarbon commodity) in Manitoba. The website briefly addresses ground water concerns, but again, in a technical manner: "There has never been a

known case of fracking-induced groundwater contamination in Manitoba. In Manitoba, oil reservoirs are located 400-1,000 meters below groundwater aquifers, and drillers are required to build multiple levels of safeguards to prevent contamination." (Tundra Oil and Gas, 2016). Social concerns are mentioned only in reference to the Manitoba Petroleum Branch: "The Manitoba Petroleum Branch regulations ensure fracking remains safe and public concerns are addressed" (Tundra Oil and Gas, 2016). As discussed in the previous legislation chapter, the deferral to the regulatory body provides little direction for concerned citizens because Manitoba's oil legislation focuses heavily on the mechanics of drilling and remains discreet about environmental and social concerns.

Perceptions of fracking outside the accepted technologic discursive has proven to be a challenge (Boudet et al, 2014; Ladd, 2013). Conclusions about environmental and community concerns are rare as information sources are often conflicting leading to ideological tensions.

Despite the overwhelmingly positive responses to the benefits of fracking economies that I had while conducting interviews with people connected to Manitoba's oil industry, three out of the nineteen interactions I had led to tense and confrontational behaviour. Although many of the people I interviewed became defensive when I talked about fracking, the mere mention of the "f-word" led the representatives from Weatherford International, Enbridge Inc., and Tundra Oil and Gas to agree only to talk off the record and about topics of their choosing, or in the case of Tundra – arguably the most influential drilling company in the area- to refuse to talk to me all together. Weatherford International is an oil servicing company that provides maintenance to existing wells while Enbridge Inc. is a pipeline company that builds and services the major underground line that transports Manitoban oil to the global market. Both of these companies reiterated to me (off the record), that their companies did not actually do the drilling or the

hydraulic fracturing, so therefore they were not directly responsible for any of the problems associated with fracking[5]. Tundra Oil and Gas never answered me after repeated phone calls and emails. In these instances, a corporate culture of non-engagement has manifest on the ground which stands in stark contrast to the positive corporate image that it promotes within the community through the sponsorship of the new arena and education campaigns in West Souris.

Uncertainty around effects and the possible misattribution around responsibility can be productive of different regimes of power and knowledge (Adger et al. 2003; Heynen et al. 2007). Neoliberal governance structures support fracking companies shirking the blame for possible environmental and social disturbances in the community, yet which still prosper from the industry (Finewood and Stroup, 2012). Companies that actually do the 'fracking' are strategic with their public relations. For example, Tundra Oil and Gas's silence towards my research could be interpreted as the company refusing to participate in any possibly controversial activities. These carefully crafted communication regimes controls the interpretation and release of information into the community, managing the corporate image of the industry.

Representatives from other companies and oil field actors were clear on their roles in the industry. This technique of shirking the blame by partitioning fracking into discrete roles is consistent in dialogue regimes elsewhere. For example, in an article titled "Faulty wells, not fracking, blamed for water pollution", Pennsylvania industry experts attempts to sway perceptions about safety and environmental concerns away from fracking and towards well design:

> The energy industry has been struggling to convince critics that fracking is safe. If the industry can persuade them that the chief pollution risk is poorly constructed

[5] Major companies can potentially use the practice if hiring contractors to effectively remove themselves (at least in a legal sense) from the extraction process. In a way this absolves them of responsibility for potential effects.

> wells- and that risk can be minimized- it might encounter less resistance from the public to expanding oil-and-gas production. (Gold, 2012).

As Gold demonstrates, the energy industry to justify risks associated with fracking by dividing the process into understandable and manageable sections. While these sections may make it easier for the public to understand the process and to place blame, the industry is not addressing the overall cumulative impacts of the industry as a whole.

The partitioning of fracking was observed in Manitoba's oil patch. When asked about his relationship to fracking, Colin, a representative from a local servicing company quickly explained that his division was not involved in the actual process of fracturing so he "will not be a source on fracking" (Colin, 2014). In this instance, the framing of fracking as a singular technical enterprise allowed the respondent to place himself outside of any normative assessment of the process. While many of the service companies in the area do not directly 'frack', they provide essential services that are required by the industry to function. The oil boom around Virden quite literally could not happen without them. The partitioning of roles into those who actually 'frack' and those who service, and are therefore connected only indirectly to the subterranean technical process, is a strategy used to avoid or shield against blame from environmental and social impacts, regardless of the lifecycle effects of the fracking process.

Ed, - Virden's Economic Development Manager, - explained how he views this reluctance of companies to speak about fracking:

> I think the industry did themselves a disservice by not doing a public education program when they started this. Some of these companies are super sensitive about fracking because here it is not a big issue, but there are certainly other markets where it is an issue where they are operating. Now they are starting to realize – the big companies – that public opinion can influence your business. Enbridge, a pipeline company, they are very conscious of public opinion and public consultation and awareness of different people. (Ed, 2014).

As Ed explains, public opinion plays an important role in an industry's success and the term 'fracking' currently relays a negative message. Social licence to operate pushes companies to disassociate from controversial messages to gain the acceptance of the community.

Geographic and geologic context also plays an important role on the framing of the potential risks and effects of fracking. The specific characteristics of place were mobilized by participants to produce southwest Manitoba as an ideal fracking space. Many of the interview subjects argued that the fracking occurring in Manitoba is different than the more commonly 'dangerous' fracking in the United States. Manitoba was a 'safe' fracking jurisdiction. They believed that the risks of fracking technology were less in Manitoba than in other places because of specific geological and market factors. Allan from the Petroleum Branch suggests that:

> Some of the misrepresentations within the media and the public interest focus on negatives about fracking, the majority of [the coverage] is on shallow gas. We have no gas wells in the province of Manitoba, we have no shale gas that is productive as of yet or has been found. So our formations that are being fracked, the shallowest would be 500 meters below the surface. The deepest would be 9000 to 20000 meters below the surface. So you are talking 3000 feet, over a half of a mile under the ground. (Allan, 2014).

The exception here is the depth of the formation yields increased safety. Though the comment is technically true regarding the absence of a shale gas economy, this is the case only because the gas that accompanies shale oil is not harnessed but rather flared into the surrounding atmosphere (as discussed previously). Again, either a discursive silence or a lack of knowledge and/or education about the specific qualities of the local energy economy context forms a productive justification of fracking technological interventions.

Linda, a local farmer with a well on her land, also spoke about geological differences: "They have different geology down there [the United States]. They mostly

have shale and the shale is loose. But out here, it's a different geography." (Linda, 2014).

Ed also brought up differences between fracking for oil in Manitoba and fracking of gas in the United States:

> In most cases where there have been bad things going on, like in Pennsylvania for example, there has been fracking for shale gas and they are generally at a shallower depth, so you have to exercise a lot of caution and do a lot more engineering to be able to control what you are doing. But when you are at a greater depth and you have different barriers, you also have different pressures and stuff like that that you are dealing with when fracking at a depth. We are also fracking for oil, which is very different. When you are fracking gas, especially at a shallower depth, if you don't contain it you can have problems. When you are fracking at great depths, you have certain pressures that mean you can't frack as far because you have restrictions on how far you can frack. You have other pressures pushing in because at that depth they are going to go in, not out, so it will go into the oil collection. So I think it is less of issue than with gas. (Ed, 2014).

In these cases, the general character of geography and geology produce safe fracking space and allow for the technology to be applied with the support of many locals.

It is unclear where this notion of safe geology came from but its explanatory power is extensive. Jeff McConnell, the Mayor of Virden, also attested to the geological differences in Manitoba that he believes makes fracking safer than in other jurisdictions:

> The real issue is that these natural gas fracks in British Columbia and the United States is a much different scenario than in Manitoba. A natural gas formation is deep and big and it is a gas. Oil is a liquid and the formation is pretty small. They are drilling a hole in the formation, and then they are putting sand, pressurized and then boom it is porous. As I understand it in Manitoba, the formation is fairly tight, so the fracture is really quick. (McConnell, 2014).

The focus here on the "real issues" serves to attribute certain values to different frames of reference and discourse. The implication in this language is that other stuff (the non-real) is somehow made up or does not matter in the same way because it is not based in the hard fact of geology. As multiple interview participants explained, the geography of Manitoba, alongside the focus on oil industry instead of gas, creates the perception of valid,

empirically-sound differences between the dimensions of local industry and those in other provinces and states. Nevertheless, fracking technology produces some universal concerns that will be addressed in greater detail later in this chapter.

Representatives from local companies and institutions that I spoke with were much more receptive to speaking about and generally in favour of the economic opportunities that oil operations bring to their communities. The technology of fracking was brought up many times and an important adaptation of the local extractive technology. Participants were generally in awe of how the combination of horizontal drilling and hydraulic fracturing transformed their oil community. This awe-struck attitude is consistent with how new extractive technologies are changing the frame through which the public understands, finds meaning and makes decisions about fracking (Metze, 2014; Willow and Wylie, 2014).

Linda, a long-time local farmer with a well on her land, spoke about her fascination with fracking, the subterranean mobility it offered drilling operators and the economic opportunities that followed these new movements: “The technology is quite interesting these last couple of years. It is amazing to see what they are doing and where they are going. (Linda, 2014). Allan of the Manitoba Petroleum Branch reflected on how the technology has changed in his lifetime as engineering advancements merged with technical proficiencies to create the conditions of possibility that enabled the fracking boom:

> It is a highly technical industry that is continuously changing and is continuing to change for years and years. I have been in it for thirty-two years and to say that you know everything that is to know about the oil industry, that person is lying because it changes that much. It never ceases to amaze me. The technology is going to come someday and someone will figure out how to get 10% more of that oil out of the ground, which is going to be another huge economic boom. (Allan, 2014).

Allan like many others in the community, expressed a faith that the progression of technology that will lead to an even better industry, further increasing yields and, ideally, allowing for safer and more sustainable practices. April, an employee from a local servicing company shared her trust in technology: “So I think as the technology gets better and better, and there is more and more legislation, and people are watching, so it’s not like things can get slid under the table.” (April, 2014). April expressed confidence that better technology, coupled with a faith in either the monitoring capabilities of the state or the self-monitoring of the industry, will lead to a more accountable industry.

The participants produce environmentality, or the policing of the environment, and this strategy plays a role as community surveillance of the industry. Locals are expected to scrutinize the behaviour of companies working in their communities to watch out for any environmental non-compliance. They are also expected to trust the industry blindly, to stand behind technology of which they do not fully understand, in the faith that their doubts over potential risks will get addressed. I speak in more detail about Agrawal’s (2005) notion of environmentality and the implications in southwestern Manitoba in my governmentality chapter.

The technology of fracking has changed the oil communities in southwestern Manitoba for better and for worse, reflecting in many ways the ambiguities that have been at the conceptual centre of the thesis. As technology advances, more oil is made available and the oil economy grows rapidly, more jobs are available, community benefits accrue and local micro-economies thrive; effects are unknown, social costs are borne by the community, environmental damage remains obscured. As most locals attest, the affects of these new technologies on the ground in southwestern Manitoba are still being catalogued. Local knowledge about the industry is also somewhat confused. Ed, contra the above point from Mayor McConnell highlighted the

newness of the fracking industry in order to rationalize the perceived improvements to the extractive process:

> They are starting to understand the technology a bit more now but in the early stages everyone was running around fracking everything. They didn't totally understand what was going on. I think that the industry is getting more knowledgeable and more detail oriented, I think that is probably a good thing in the end. As far as oil, with the technology, the geology and the depth that we are at, it is probably more of an issue with the placement of wells. You know one well to another well. They have service rigs and they drill new wells but they also service existing wells. Yeah they are doing some amazing stuff. (Ed, 2014).

The fracking technology is awe-inspiring in the way that it has opened up market possibilities in Manitoba. The overall attitude regarding the technology appears to be that it is safer in Manitoba than in other regions. While I cannot confirm that this is true, (and many industry proponents and members of the Petroleum Branch claim that it is), as the industry is highly secretive about technology, the perception remains strong. Yet the reiteration here of the appeal to the specific local geology and the scale of the enterprise serves to naturalize fracking. In other words, if fracking is good or correct and simple to execute in this geology, then it is perfectly normal that it should be done here.

Fracking as an Environmental Experiment

Controversy remains over the extent of damages that fracking has on the environment, though in some respects this controversy is manufactured. The Council of Canadian Academies (CCA) declared in a recent study that more research is needed before definitively concluding that the practice of fracking is safe (2014). The lack of transparency over the environmental impacts has the effect of soothing potential health and safety anxieties of those living and working amongst the oil boom. Despite many reputable studies pointing out concerns about health (OCMOH, 2012; Kryzanowksi, 2012; Prud'Homme, 2014) and environment (CCA, 2014;

Howarth et al., 2011; Jackson et al. 2014; McGraw 2011; Ellsworth, 2013; Parfitt, 2011; Wilbur, 2012) no definitive harm has been concluded locally. The discrepancies over potential and actual issues are a result of the complex mixture of scientific uncertainties (Boudet et al. 2014), logistical impracticality of testing (King et al. 2011) and the geographical and geological diffusion of underground risk - it is harder to see subterranean evidence, therefore harder to study and predict. Concerns over water use and groundwater contamination, air pollution, and increased risks of spills are amplified by the double nature of risks being smoothed over by the lack of transparency. Many participants that I interviewed mirrored this notion by expressing trust in the industry, yet have underlying concerns about the environment. As academics and regulators argue over or try to definitively prove/disprove the exact characteristics of risks to the environment, industrial proponents continue to develop the land.

As discussed in the legislation chapter, there are tangible gaps in environmental knowledge surrounding fracking in Manitoba. These unknowns contribute to the way fracking is thought about and subsequently managed locally. Megan of the Manitoba Eco-Netowrk and Water Caucus explains how oil extraction activities, in the face of environmental and health uncertainty, affects her and her work in the environmental non-profit sector:

> I think fracking has so many potential detrimental elements to our health and environment that are not totally understood and this scares me. I think it is not well advertised what fracking is and how much is happening in Manitoba. I don't think the potential negative effects are well advertised either. I was looking at one of the government websites to look at the regulations surrounding fracking and it was the oil and gas act. It's so vague that it scares me. I remember one point says human health and environmental health should be taken into consideration… but what does that mean? There are no solid numbers or quantifiable numbers, all of the regulations are so subjective, and how do you prove anything? (Megan, 2014).

Megan points to gaps in available information for the public on fracking in Manitoba. The epistemological silence can be frustrating for those looking for answers. This void can also be seen as advantageous for the industry.

The unknown, "vague" impacts combined with a lack of regulatory transparency, in this instance, favours the extractive plans of oil companies by providing a governance platform that is difficult to understand and does not provide a mechanism for the quantifiable assessment of risk. At the root of this problem is the complex calculus of a lack of useful information, an inability to access what information exists, and a host of legal and proprietary measures that protects oil and gas companies from releasing their own data.

Allan of the Manitoba Petroleum Branch explains how the government has the right to request information, but companies are not required to freely provide it: "A lot of companies spend hundreds of thousands and even millions of dollars designing these fracks. So a lot of that they keep very close to their chests. We have the ability to request that information at any given time if we see a concern or anything out of the ordinary." (Allan, 2014). As Allan's example shows, the massive amounts of money put into fracking technology trump environmental concerns, justified as a common industrial practice because of competitive and privacy concerns. For example, in 2015 a Manitoban fracking forum was organized by a local environmental non-government organization, which chooses to remain anonymous for political reasons. The forum fell through because there was zero involvement from the local oil industry and provincial government. The Winnipeg Free Press commented on this lack of involvement in a 2015 article:

> Last year, the oil industry earned not one mention in Premier Greg Selinger's throne speech or in the budget address delivered by then-finance minister Jennifer Howard. It appears in virtually no news stories beyond those in the Brandon Sun. There are no chamber of commerce luncheons about it, no television ads

> promoting it, no big debates about it during elections. To most of the province, the oil industry is invisible. When local environmental groups tried to change that this spring, industry and provincial government staff clammed up. (Welch, 2015).

As seen in the attempted fracking forum and the Winnipeg Free Press article, there is an active silence surrounding the oil industry in Manitoba. Through this logic, companies are exempt from public disclosure because of the danger that any disclosure might incur against potentially lucrative business transactions.

Companies are exempt from public disclosure because of the danger that any disclosure might incur against potentially lucrative business transactions. For example, during one of Manitoba's largest oil spills, approximately 100,000 liters of oil spilled from a broken Tundra Oil and Gas pipeline on the western boarder of the province, yet the details regarding the accident went largely unreported. "Reports say the leak found on the Tundra line flowed undetected for 10 days, but people living near the site say that the leak had to have been running for about a month, given the amount spilled. Tundra was contacted for comment; a message was left but not returned." (Dyck, 2015). Details surrounding the timeline of the accident and the amount spilled to the ground remain fuzzy. The lack of clear communication between oil companies and the public has created uncertainties and distrust as to how fracking is affecting the land in Manitoba.

Another uncertainty that people have in regards to fracking is how the chemicals in fracking fluid will affect their health (Perry, 2012; Witter et al. 2008). Currently in Manitoba, there is no avenue for the public to obtain information on local chemical use. Although no specific localized information is available, the FracFocus website provides a list of generic chemicals used in fracking fluid including acids, biocides, breakers, clay stabilizers, corrosion inhibitors, crosslinkers, friction reducers, gelling agents, iron controllers, non-emulsifiers, pH

adjusting agents, scale inhibitors, and surfactants (2016). Tundra Oil and Gas, one of the main drilling operations in Manitoba, offers this information on their website: “Fracture fluids used by the industry contain many of the same additives found in water treatment facilities or common household products such as toothpaste and detergents, and the industry is moving to greener fracture fluid alternatives.” (Tundra Oil and Gas, 2016). In this instance, Tundra Oil and Gas plays down the use of fracking chemicals, relating the fluid to nothing more alarming than the chemicals already being used in households daily. Despite this benign explanation, the actual list of chemicals is not provided.

International demands have been made to acknowledge health concerns associated with fracking, yet public health experts have been excluded from decision-making (Goldstein et al. 2012; Hudgins and Poole, 2014). Through my research, I reached out to the Prairie Mountain Public Health Office located in southwestern Manitoba to speak about possible local health concerns related to fracking. A conversation was arranged, but when the time came to speak, the representatives from the office declined to speak about fracking and health. This reluctance for a provincial organization to speak on fracking and health lends to the climate of reluctance to provide meaningful information about the industry to the public. Long-term, short-term and cumulative influence that fracking has on health remain unknown because basic questions such as ‘what is in the water’ is not being answered.

Those searching for information often come across other roadblocks that complicate the pathway that chemicals travel in the environment. Oftentimes there is more than one company fracking in a community, increasing the variety of chemicals introduced into the environment and, because of the difficulty in tracing industrial pollutants underground, decreasing the chances of a company being blamed for their actions in the event of a leak or contamination. Wylie and

Albright (2014) describe a situation in the United States where a lack of pre-existing scientific or geological baseline has enabled industrial impunity. If community members do not have industry validated baseline studies of biophysical and health conditions *before* fracking started, then it is hard for their cases to hold up in court (Wylie and Albright, 2014). This situation has not yet arisen in Manitoba, but it seems clear that lack of available information has the potential to increase community distrust in the industry and government regulators tasked with governing the industry.

In Manitoba, fracking companies are not legally required to disclose the chemicals and their quantities used to frack wells, in contrast to other Canadian jurisdictions like British Columbia or Alberta (FracFocus, 2016). When asked if the public had access to the chemicals being used to service oil wells in Manitoba, a representative from a local servicing company responded, "I have actually never been asked that question. All of our products do have a Material Safety Data Sheet (MSDS) and any product that we apply, the MSDS has to be accompanied with that product. But to say if the public could, I would think by request, but I don't know. That is a good question. I have never even thought about that." (Anonymous, 2014). As this quote exemplifies, public disclosure of chemicals is certainly not a common industry practice. A representative from a local environmental organization reiterates the secrecy of the trade's chemical use: "They use chemicals and stuff for fracking. We don't know what chemicals they put in because it is a trade secret. But in British Columbia they have a website you can go on." (Dean, 2014). The reluctance to share information about chemical use places the industry's competitive interests ahead of community health. The Manitoba Petroleum Branch is currently working on a website (and has been for the past several years) that lists chemicals used in the province, but until then major gaps in knowledge continue (Ernst, 2013). Without this

information, people who live within vicinity to wells in Manitoba do not know what chemicals they risk potential exposure to in the air, water or soil.

In contrast to the hidden subterranean legacies of fracking, surface spills are one of the more visible environmental events in the oil industry. Many of the people I interviewed that were connected to the industry felt confident that companies in the area had adequate spill response and felt confident in regulatory bodies to enforce clean up. Allan, a representative from the Manitoba Petroleum Branch, explains how the province addresses spill response:

> But the oil industry is very well trained with dealing with that within the regulations. I sit on the board, Manitoba Spill Cooperative, we have $150,000 worth of equipment that is ready at a moment's notice in the event of one of those spills. Our department takes the lead role in overseeing the cleanup in those situations. Under our legislation the companies have to belong to the oil spill cooperative. We have an exercise each year where companies are required to send representatives. It is a training exercise to show people how the equipment is to be used and the best-case scenarios the best way to clean up. We deal with a lot on the environment end and in some cases environmental reviews are required to done on large pipelines, that goes outside our jurisdiction. (Allan, 2014).

As Allan describes, the Manitoba Petroleum Branch is prepared and expects spills to occur during drilling and operations. Colin, an oil service worker expresses similar descriptions in his companies spill response:

> The government only allows certain quantities that can hit the ground. We have some products where only 100 mL cannot hit the ground. So it varies quite a bit. Our strongest products are regulated the most, our weaker products are less. I am not saying that a spill is acceptable, but we are highly regulated when it comes to spills. (Colin, 2014).

I go into further detail about spill numbers, spill response, and accident reporting in the previous legislation chapter but the point is that the Petroleum Branch uses scale to determine how much spillage is ok and how much is simply part of "normal" industrial processes. The industry argues that they are heavily regulated, but I argue that they are not.

Dean, the manager of the West Souris River Conservation District explains how his environmental organization has a good relationship with companies in the area regarding spills: "The companies will let us know if there have been any oil spills. Sometimes we are the first people to get calls from the landowners. Tundra Oil and Gas has been really good letting us know. It is nice to know the information" (Dean, 2014). Some people, such as Ken from an oil field trucking company, did not seem overly worried about the risk of spills to the environment: "No, I am not too concerned about spills. I guess if you are pulling this out of the ground you are going to have a little spill. Even for example, if we take the truck and there is a leak from our trucks, not from what we are hauling but from under the truck, we have shovels and we clean it up. It is required by the companies. It is enforced very hard out here." (Ken, 2014). The varying confidence in spill cleanup can be thought about as an issue of spatial and temporal scale. Since a spill is a tangible event that can be directly correlated to the industry, it is easy for community members to measure successful corporate environmental responsibility alongside the successful management of leaks and spills. The more abstract long term and cumulative impacts like the prospect of slow leaching of chemicals and over use of ground water are less obvious as they are felt on a grander temporal and spatial scale.

When speaking of environmental issues in the communities, the potentially deleterious long-term effects of agriculture (see Ong, 2014; Pitchel, 2016) – the other prominent industry in the area – were often invoked in comparison. Environmental disturbance was often framed as an unpleasant fact of life in southwestern Manitoba. Along these lines, environmental manipulation acted as a justification for the environmental concerns that accompany oil extraction. April from an oil field servicing company suggests that:

> There is so much more environmental management involved in oil now. Like, they are really good at reclamation now, so I don't think it is as big of a concern as it would have been in the last oil boom. Technology and legislation has improved so much. I think everything does affect the environment, but I would just hope that everyone is doing their due diligence and it gets put back as best as it can and that it doesn't make too much of a difference. In this area farming is huge too, and farming disrupts the environment as well. So it's not as if farming doesn't have any downfalls. So I guess if you compare them, maybe oil isn't that much worse than farming. (April, 2014).

As April shows, juxtaposing the oil industry with the environmental concerns of big agriculture, the risks of fracking can be better justified. Moreover, the faith that any environmental harm will be put right by a combination of regulation and reclamation is a powerful discursive trope.

Other community members shared similar views on farming versus fracking: "I have more concerns about what the farmers are doing to the environment with their sprays than the oil industry." (Bill, 2014); "I think there is more water pollution in the little creeks and sloughs here from all the farmers spraying. It kills the birds and the bees and the trees nearby." (Linda, 2014); "There is the odd person who complains about fracking and the ground water, but it is the same thing as when hog barns started coming in, people just went crazy." (Dean, 2014); "Farming is a slower process, oil is so quick. You are surveying the land and setting up drills within days, versus farming which is a steady process. Oil is so much bigger and faster, so it probably scares people. You don't see that in farming." (April, 2014). As these examples show, both industries are important to the community, and both share concerning environmental consequences. Yet fracking and farming are experienced on different scales. Farming has genuine consequences but these outcomes are generally understood and accepted by the community due to a long and intimate relationship between farmers and the land. The impacts of the oil industry are mostly unknown by the community (and the broader community at large), and has evolved drastically over the last decade. The pair is not simply comparable, but by pointing out each industry's

flaws, the risks of unknown environmental damage are overshadowed by blame. By focusing on which industry has the 'worst' consequences, there is potential to lose sight that both industries continue to exist and continue to damage the environment.

Another prominent environmental concern brought up by community members was the industry's use of fresh water resources. To frack in Manitoba, as has already been established, potable ground water is mixed with chemicals and sand, and injected into wells under massively pressurized conditions in order to create mini-fissures or 'frack' wells. As mentioned earlier, the actual list of chemicals and their quantities is unknown to the public. The provincial government states that the oil industry in Manitoba uses under 500 cubic decameters (dam^3) per year or the equivalent volume of 250 grain elevators of water. There are no listed quantities, but the government states that the water used in well completion includes produced/recycled water plus ground and surface water (MB Water Stewardship, 2013). This process releases tight oil and gas that is captured in varying concentrations in the rocks. The process currently requires fresh water resources that could be used in agriculture or for domestic uses. Once water is used in a fracking process it is contaminated and cannot be reintroduced into the water cycle. This is 'slick' or 'produced' water; permanently adulterated, requiring long-term storage in order to reduce exposure.

One concerned citizen expressed this issue to me: "I guess one of the biggest things that bother me the most about the fracking industry is the use of fresh water. We have some wells that are licensed under water stewardship and water services board. That is something I would really like to see. And there are companies that are starting to look at other sources than our potable good fresh water." (Anonymous, 2014). One of the major concerns is that the actual quantity of water used is not well recorded. As the concerned citizen mentions, it is not a

requirement to register a well with a government agency, so much of the withdrawals are not calculated. The mayor of Virden, Jeff McConnell, also brought up the water conservation issue:

> The thing they don't say is that in Manitoba for every well fracking it is apparently the same amount of water that two and a half households use per year. But when two and a half households use water, it is all recovered. But we are not recovering that water. They don't talk about that. However, the petroleum guys do talk about recovering water from frack wells and recycling it. I don't think it is common practice, but something they say because it looks good. (McConnell, 2014).

Recycling here refers to the practice of cleaning frack water to the extent that is useable in another frack, through still not suitable for human or animal consumption (Waste Water International, 2016). Dean from the West Souris River Conservation District echoes the mayor's concerns: "I guess the only think I don't like about fracking is the water they use is never recovered. It is gone. Around here they use surface as well as potable water. I know my board would rather them use something else" (Dean, 2014). As McConnell and Dean lament, once the water is used for fracking, it is lost to the system. For a community so reliant on water for the two major industries, the lack of clear withdrawal records and water use is a potentially alarming oversight.

Air quality is another pressing environmental concern for members of the community. In Manitoba, fracking targets oil. Yet oil rarely exists in isolation from associated gases. In the extraction process, both liquid and gas hydrocarbons are brought to the surface. However, in Manitoba, there is no infrastructure to harness gas for industrial use or for export to market. Any gases brought to the surface in the extraction process are flared off in large stacks. "Excess" gas is quite literally burned off in a large flame. The potential health and environmental effects of flaring are vast, as large amounts of carbon dioxide, methane and other greenhouse gases are

released into the atmosphere (Field et al, 2014; Macey et al, 2014). Flaring is regulated by provincial governments in Canada, with Manitoba having the most lenient legislation out of the petroleum producing provinces (CAPP, 2016).

For many people in the surrounding communities the flaring process was a topic of concern. Dean from the West Souris River Conservation District explains how his unease about the flaring process affects his thinking about his community and safety: "I live about five miles from a stack. You can see it glowing at night. Little nervous, but I can't smell it or anything. I was driving past it because it's right there, and I've smelt it once or twice. Sour gas. A little concerned but I think it disperses. I wouldn't want to live right next to it." (Dean, 2014). Dean goes on about the uncertainty of the air quality in his community: "I don't know enough about flaring about what's coming out of it. I hope we are far enough away from it. Unless they find something to do with that gas I guess that's the way it is. There's not a lot of stacks in this area compared to western Canada. It sort of is concerning, you got something burning that never goes out and I can see it from five miles away at night." (Dean, 2014). As Dean exemplifies, individuals are uncertain about the effects that the industry has on their air and bodies.

Despite the community concerns and ambiguous knowledge about the effects of gas flaring on air quality, the fracking industry takes air quality and safety seriously for their workers, relying on a developing technical and mechanical regimen to police potential air toxicity. Indeed, this potential risk is built in to the industry. Bill, a long time rig worker explains the safety equipment companies require him to use while servicing oil batteries:

> With this first company, they had me put on an air mask to measure the same old things I have been measuring for twenty years now. But now you don't do much of that anymore. I have a monitor in my truck. It's good for hydrogen sulphide, black oxygen, it detects four different things. If we have an H_2S alarm, fans cut out in the

> building and it takes ten seconds, and if it hasn't cleared the air, then it alarms. It shuts down. So you go up there, nine times out of ten is it just a little puff of gas, or the winds are swirling. But you are supposed to phone someone else to come with you. But I have this monitor, so if you go into the building and you open the door and there is no gas, you still have to reset everything. (Bill, 2014).

As Bill explains, the oil companies take the safety risks of employee exposure to harmful gases seriously. There are even specialized companies in Manitoba's oil field like "Discovery Safety" and "Elite Safety Services" that outsource the H_2S training and other safety courses to production companies. These risks are acute, easily understood and there is a tangible safety solution. However, the same level of concern is not registered for the more difficult to monitor long-term consequences of low exposure on people and animals in the community.

Air pollution of this nature is one of the more visible consequences of fracking, as flaring is done above ground. The flaring is so intense in North Dakota from fracking in the Bakken shale region that it is visible from outer space, competing with the light pollution from Minneapolis and Chicago (Ceres, 2016). Air pollution, by its very intangible and migratory physical nature, is something that easily crosses the boundary of industrial areas into residential communities (Parr, 2006). As well, because of the overlapping geography of industrial activity, agriculture and everyday life in southwest Manitoba, sometimes these effects can occur simultaneously and in the same location.

Megan from the Manitoba Eco Network in Winnipeg describes how air quality problems in western Manitoba can be felt province wide:

> When you start talking about common goods, like air quality and the health of people around me and my province, maybe fracking is not directly affecting me, but if someone in the Virden area experiences problems in the air and suddenly their health costs go up, then my health costs go up too because we collectively pay for these things as a province. So directly [effected] no, but indirectly I think I am impacted by fracking. There are also the contributions that fracking makes towards greenhouse gases and climate change. I might not be able to quantify this, but it is definitely a

> negative, not a benefit. Climate changes affects all of us. The quality of the air we are breathing is in all of us. (Megan, 2014).

As Megan explains, there is no boundary between the air we breathe and our bodies. The chemicals that are released into the air through flaring enter the lungs of those in the communities (Bickerstaff, 2004; McKenzie et al. 2012; Meng et al. 2014). The lack of long-term understanding of flaring on communities creates an uncertainty of what air pollution is doing to people's bodies. This also opens up a broader discussion about the larger scale climate effects and more localized economic effects (Kunstler, 2007; Newman et al., 2009; Levy and Kolk, 2002).

The majority of the people I spoke with identified environmental uncertainties associated with the fracking industry in southwestern Manitoba. Alongside these uncertainties was a theme of industrial inevitability and resignation to varying levels of disruptive effects. April, from a local servicing company, summarizes what might be called a necessitated ambiguity towards the industry: "I am not opposed to the oil industry. I can't be, I work in it. It is never going to stop. There is no amount of people in the world that can make the industry stop. Let's face it, there is always going to be oil. There is never going to 100% wind or solar power. Not in my lifetime and probably not in yours." (April, 2014). This false dichotomy – pro- or anti-oil – expressed here, alongside a powerful discourse based in an overwhelming sense of inevitability, combines to create a kind of local inertia.

Attempts to change, monitor or regulate industrial endeavours are not taken well, or are at least placed on a continuum of doubt. Mayor Jeff shares a similar outlook on the industry: "The current 'oil versus no oil' conversation is unfortunate. It is not an either or conversation because our world is currently created to run on oil. Our entire global economy relies on it." (McConnell,

2014). There is a curious tautology that runs through this line of 'common sense' thinking: oil will be, because we need oil. Colin, from a local servicing company adds a postscript on the productive effects of the engagements and uncertainties of living amid oil:

> The environment is always a concern. We have regulations and we implement procedures to ensure that we have learned from the past. But so many procedures are built *after* an incident has already happened. I think that even when you are proactive, you don't catch everything. I think with education, technology and money we can stop anything from happening… but only *after* it has already happened. (Colin, 2014).

In other words, oil is safe, but only after it is not. People living amongst Manitoba's oil boom are faced with uncertainty of how the industry will affect their environments and bodies. Despite identifying areas of concern, the industry continues forward. As Colin puts it, the industry is leaving the consequences of their actions until it is too late to deny.

Fracking as a Lived Experience

Fracking is much more than the technical act of horizontal drilling, hydraulic fracturing and interventions into the environment. It is also a lived experience, producing its own set of social relations and cultural modes. The oil industry often produces a unique identity among its workers and host communities; 'rig culture' is built up as a way of life. In Emily Eaton's 2016 analysis of 'Fault Lines' in southeastern Saskatchewan, the rural landscape and lifestyles of fracking are documented and photographed to showcase the unique circumstances that follow oil culture. . These circumstances can also be observed among the residents in southwestern Manitoba. The famously macho, homosocial workforce (Ward, 2013), the intensity of twenty-four hour work days, and infamous overtime payouts (Mandel, 2013; Way, 2012) all contribute to Manitoba's oil culture, a cultural identity that is especially prevalent in Virden (Brandth and Haugen, 2005; Bye, 2009; Saugeres, 2002).

Many of those interviewed from the Virden area spoke with pride about the benefits that the oil industry brings to their lives and communities. Ken from a local oil field trucking company, explains how he has profited in basic material ways from oil extraction: “If you work hard at it, you’re going to benefit from your paycheck. You are going to make more money in the oil field than flipping burgers. I have been in trucking for a long time. It is a lifestyle change, putting in some long hours, but the benefit of that is in your time off you can do some stuff. You can go and take off. It’s a balancing act.” (Ken, 2014). As Ken claims, the industry rewards long hours and hard work with big payouts, allowing workers to earn more money and more personal flexibility from their labour. Colin, an employee at a local servicing company, explains the physical demands of the oil industry: “I am on call twenty-four hours a day, seven days a week, 365 days a year. We try to get Saturday/Sunday off, but we also stay on call twenty-four hours a day. Sometimes there is a fine line between hard working and stupid. But I like it. It’s exciting, there is always something to do. You never know what you are going to do the next day.” (Colin, 2014). As Ken and Colin shared, the oil industry offers high wages and interesting work for those who are willing to put in the hours. The ‘work hard/play hard’ ethic operates as both a mantra and a justification for the demands of work in the oil industry.

Even those who do not work directly in the oil field, but in secondary and tertiary services, see the economic benefits of the local oil boom. Manny, a hotel owner in Melita, who recently moved to the area from Toronto, is excited about the business opportunities that follow oil development: “The hotel has sixty-four rooms. All of them have full suits; you get a full kitchen, a hot bay and a dishwasher. Since we are open, January 22nd, 2014, we have been very busy. We only had a down time because that was the down time for the oil people due to the road bans.” (Manny, 2014). Manny’s hotel caters to the oil industry, providing out of town oil

workers a place to sleep during their long shifts. Like many in southwestern Manitoba, Manny is capitalizing on the oil boom by providing services – a bed, a 'complimentary' breakfast, and a place to call 'home' – albeit at a high cost, to itinerant workers who are unmoored in the region but have money to spend. These service industries are often employed by the women of the oilfield while the men work the more physical and better paying jobs. Although there are no statistics available on the gender make up of Manitoba's industry, anecdotal evidence shows that the industry is massively favorable to men (Goldenberg et al., 2010; Tosh and Gislason, 2017). Out of the twenty interviews conducted, only five were with women, and of that number, only one woman worked directly in the industry. While the 'roughneck' skill set is often transferable to other industries, the service industry is often more anchored to the specific place and cannot be easily moved to the next booming industry. This is exemplified in the case of Manny's hotel. The inevitable effects of the eventual downturn are not factored into Manny's business plan. Indeed, who will occupy the suits in Melita if and when southwest Manitoba's oil industry becomes unprofitable or moves on to a different location? The oil industry moves with remarkable flexibility and speed, but the local social, housing and service infrastructure built to sustain it does not.

Allan, who works on the regulatory side of the oil industry, sees the boom as an opportunity to secure his community's economic and demographic future by providing opportunities for local youth:

> There are huge job opportunities. Instead of seeing all of our young people heading west, to Alberta, there are a lot of young families staking roots here. My wife is a teacher in Reston, maybe 800-900 people in the community. They are actually seeing student levels increasing where ten years ago it was decreasing. Young people are staying here. They don't just have a job; they have a career per se. In most cases a very good salary if they work in oil, it is a high paying industry. But it is a high demand industry, you work when it is thirty degrees

> above and thirty degrees below zero. It is a high paying industry but you deserve the money you make. (Allan, 2014).

As Allan explains, the industry brings demanding, well-paying jobs to the community and provides an opportunity for young people to put down roots in the area. The connection made between hard work and value in the above examples is important. On the oil patch value is attached to endeavor; value (personal and monetary) is earned by battling elements and climate, by seizing opportunity and exercising human control of nature (Brandth and Haugen, 2005; Bye, 2009; Saugeres, 2002).

The value of oil is manifest primarily in economic and material benefit. The opportunity to make substantial individual incomes from work on the oil patch was often mentioned: "The farmers love it, there are a lot of poor people prior to the oil coming and now there are lots of rich people. It's good for them" (Dean, 2014). As Dean notes, the oil industry has brought lucrative opportunities to those who would not normally be in a position to benefit from their possessions or from their labour: farmers can lease land formerly only useful for irrigated agriculture, workers can earn more form their labour then they could as labourers on those same farms, and service providers can capitalize on the various social and economic needs of the industry and its labourers. A kind of boom mentality profit symbiosis develops as the lived experience of the oil becomes normalized. This mentality brings its own challenges. Jeff explains his take on the oil culture as an outsider from Winnipeg transplanted to Virden:

> It is a bit of a unique mind set around it too, this is coming from a suburban man who grew up in Winnipeg. My parents were teachers and professors so I am of a different mindset. Here, you have guys that are not necessarily graduates of high school, or just have high school, they go and they work on the rigs. And their employers, a number of them are smart enough to say look, you're not going to make this kind of money all of your life. Some of them might find a way, some of them work their way up the ranks, there are quite a number of wealthy self-made

> millionaires from here because of the fact that they grew up in the oil industry. (McConnell, 2014).

As Jeff explains, the industry brings large sums of money to its workers, and especially to its managers and local service company owners.

Peggy, a long-time community member of Virden speaks to the challenges she observes with quick money: “We see a lot more big fancy trucks but we also see a lot more drugs and burn outs who will never work in the oil field again. There is an evil side of the dollar.” (Peggy, 2014). As Peggy explains, the access to an almost instant infusion of cash can open up economic possibilities for an individual; these can build local social and economic foundations but can also be put to more temporary uses that could exacerbate social and economic dislocations that emerge in the wake of the oil industry.

The material benefits of work within an oil boom can be juxtaposed with less appealing and sometimes more pernicious characteristics of living downwind of a capricious boom and bust resource economy. Ed, who works in economic development for the town of Virden, explains some challenges he sees emerge between those involved and benefiting from oil extraction and those who do not:

> If you are involved in the oil industry then it is super good. If you are involved in business then it is good. But if you are not, or you don’t have family that is involved it is seen as a bit of a pain. I think that in general it has been good for the community. It’s trying to manage the growth. But everyone knows that at some point, resource communities do suffer. (Ed, 2014).

The negative externalities of the oil industry are born by everyone in the area, even as only a portion of the population benefits through direct interaction with the industry. As Ed’s message of caution implies, the industry will provide material benefits to the community when the oil market is strong. When the market is down, there is a greater chance that the local economy and

corollary social institutions will be squeezed. Ultimately, the entire community will suffer across the board. In this sense, benefits are individualized, but effects are spread across the social and economic spectrum of the region.

The effects of these negative externalities are further exacerbated by a local/outsider tension perceived by many in and around Virden. The high paying and readily attainable employment opportunities have attracted 'outsiders' into the historically tight knit, and perhaps socially closed community. One woman noted the changes she observed when she recently returned to her hometown Virden after being away: "I moved back here after I had been away for fifteen years. But I don't even know most of the people here anymore. It has changed a lot that way." (April, 2014). Another Virdenite shared his observations about his town: "You know you go to the bar when you are eighteen and you know everyone. Now you really know nobody because of all the influx of workers from out west." (Colin, 2014). As Colin and April shared, the oil boom has brought in an influx of out of town workers into the area in search of jobs. There is little judgment in their commentaries, but an undercurrent of unease is noticeable. The social location of 'local' is challenged in the demographic outcome of oil.

With immigration into the area comes a perception of what kinds of social formations and ideas the 'other' might bring to the community (Carrington and Pereira, 2011; Petkova et al. 2009). There was a general perception among many individuals interviewed that the influx of newcomers to the area has led to an increase in crime. There were no specifics describing the crimes available, just that it was mentioned in multiple interviews that the area no longer felt as safe as it used to. These sentiments appear to be justified in local media outlets such as the Brandon Sun's article titled 'Severity of crime climbs in Brandon': "The agency released its annual crime severity index report on Wednesday, which shows that the severity of crime in the

Wheat City was up overall in 2015 compared to four years prior." (Hitchen, 2016). As the Brandon Sun article states, crime in the area, at least in Brandon, is reported as becoming more severe.

However, when asked about crime in the Virden area, a local RCMP suggested, "The area is prosperous, the whole area. There are a lot of people working. I don't know, sometimes that perception is media driven, sometimes it is the rumour mill that crime is running rampant, like the sky is falling." (Steve, 2014). The 'chicken little' metaphor appealed to here exposes a local unease about some of the social changes that are the result of immigration and changing and changing local demographics. A local woman articulates this sense of unease: "There is an increase in crime from when I used to work in Virden. I don't know if it has to do with the oil, but maybe bad parenting. Maybe it is because it is a busier town now and people are not paying as close of attention. There is definitely more crime" (Anonymous, 2014). In this articulation, oil and/or social location result in anti-social behavior. Again, the negative effects of oil (possibly combined with a parochial attitude to outsiders and their social values) are spread across all members of the community. Interestingly, despite the attitude towards crime in the area, the local RCMP officers argue that there is no information that indicates an increase in crime rates and that southwestern Manitoba remains a relatively safe place to be:

> I know in other oil producing areas, like southeastern Saskatchewan or northern Alberta, there have been an increase in prosperity and an increase in crime. So far we have not seen that here. That is not to say we don't see any crime, we do, but it is funny here with the perceptions, people think it is like the Wild West here. To be honest, people are too tired from work to do anything. You talk to the hotel owners and the say the men might have a beer after work, but they are sleeping early because they have work in the morning and they have good jobs. It is funny that is has that reputation. (Steve, 2014).

As Steve explains, many have fed into the idea that the oil crowd has a rough reputation, but as it turns out in southwest Manitoba, the proverbial bark might be worse than the bite. So how can we account for the distance between perceived changes and the actuality of newcomer behavior? Steve warned: “I think if there was a severe slow down in oil, then yeah there could be some issues.” (Steve, 2014). Yet if we take Steve at his word, the high demanding work hours required by the oil industry, coupled with the physical exertion required and strict drug and alcohol corporate programs (stemming from the strong HSE culture discussed in the previous chapter) seems to be enough to suppress the tendency to criminal activity seen elsewhere in booming oil economies.

Despite being tamer than expected, the incoming itinerant workforce faces challenges in the community when it comes to securing housing: “One of the biggest things in the Virden area is finding a place to live. It is hard all over southwestern Manitoba and southeastern Saskatchewan. The rent is outrageous! It costs more to live here than in the city of Winnipeg. It is as if oil came in and everything went up in price.” (Peggy, 2014). Peggy touches on some of the economic challenges of living within a resource community. With a rise in income, comes a rise in the cost of living. Colin, another long time Virdenite shares Peggy’s sentiment: “Housing seems to be on a supply and demand basis. The rent always seems to be climbing.” (Colin, 2014). As Colin and Peggy have shared, the demand for accommodations in the area is significant and has led to a shortage of affordable and available housing.

Housing can be a problem for those coming to work in the area, but the drastic demand can affect those already living in the community (Jones, 2013; Weber et al., 2014). Jeff McConnell, the mayor of Virden, speaks of this: “As your housing prices go

up, all of your assessments go up. Depending on how people are living there, the assessment on their property might go up. This can be a problem for those on a fixed income. It is kind of sneaky" (McConnell, 2014). As Jeff explains, monetary pressures are created during an oil boom, and those who do not work in the oil industry may not be financially prepared for the cost of living increases. This is especially true in the case of retirees, those living with disabilities or those who require assistance on a recurring basis. As the local economic profile changes in the midst of oil, those on fixed incomes are potentially stretched economically beyond their financial parameters.

The development of an oil industry can have a negative correlation on other industries in the area because it can change the economic environment. Industries not closely related to oil activities struggle to keep up with the boom. This might be conceived of as another type of negative externality. High wages constrict the available work force for other sectors. As a local resident maintains, "It's not all wonderful and luxurious with the high wages. It comes with a lot of disadvantages I think people need to know that. Our retail industry cannot compete with the oil field and they suffer. All of the good workers are sucked out to the oil field. There are the high costs because oil makes everything go up" (Peggy, 2014). As Peggy suggests, there are labour issues because the oil industry's ability to offer high wages and long hours are difficult to compete with. Another local farmer confirms that, "It is tough on the small businesses. Sure they are busy, but they can't keep up. Everyone is working in the oil patch for big wages." (Linda, 2014). Indeed, wages have skyrocketed across the board, forcing local businesses to compete with the mobility and financial heft of the oil industry and its servicing sector: "I have often said you cannot expect to pay an employee minimum wage in this town."

(McConnell, 2014). As Linda and Jeff explain, wage expectations are much higher for *all* jobs now that companies have to compete against the oil patch for workers. Local businesses have been squeezed as a result, some to the point of collapse. For example, 'The Farmhouse Bistro and Tavern' opened in Virden in 2013 and ultimately closed its doors in 2016 after a struggle to make ends meet (CJO3, 2016). The oil industry has heightened wage expectations in the area, leading to prosperity for some and frustration for others.

As seen in these examples, the oil industry is more than just a technical exercise in southwest Manitoba, it is a culture. Lives become intertwined within the network of pipelines, trucking and rigging to shape the patterns of a lifestyle. Fracking has unique impressions on this area of the province which create distinguishable characteristics in the communal way of life. These layers are woven together to describe the lived experiences of fracking in Manitoba.

Conclusion:

The field interviews I conducted and the experiences I have outlined in this chapter support the understanding that fracking is more than just as a technical exercise. I have pointed to gaps in legislation and discursive silences that devalue the fracking experience, shaping the natural environment, economy, community, and way of life in the region. Oil has intrinsically become woven into the story line of place in southwest Manitoba. I argue that to fully understand the reality of the industry, the untold stories between the gaps must be validated.

Chapter 5- What goes up must come down: Conclusions about life in Manitoba's oil field

The timing of this thesis research has, perhaps unsurprisingly considering the precarious nature of extractive economies, provided the opportunity to explore the social and economic effects of fracking during both an economic boom and a downturn in southwestern Manitoba. When I first started researching this topic in 2014, Manitoba's oil patch was yielding record highs in drilling and production, as technology coalesced with the global market forces to encourage extraction at breakneck speeds. The boom was not widely heralded, but it did get the attention of many across the province. The *Winnipeg Free Press* advertised Manitoba's oil continued prosperity in a 2014 article: "Between September 1, 2014 and the end of November, 168 new wells were drilled. That's more than the 116 drilled during the same period last year" (Welch, 2014). And there was no sign of the impending turn of drilling fortunes. The same article claimed, as others had before, that the Manitoban oil industry had advantages over other producing locations. These advantages – legal, geological, financial – made it a more secure market and guaranteed its success into the future: "Manitoba's fiscal arrangement – the operating cost to service wells and its royalties – are cheaper for producers than in other jurisdictions. And, though Manitoba's wells tend to be modest producers, drilling is still far cheaper here – about $1.3 million per well – than in North Dakota, where the oil is deeper, or in Alberta, where companies begin to shelve expensive capital investments in oil sands projects when prices dip below $90 a barrel" (Welch, 2014). The *Free Press* article reinforces the general perception in southwestern Manitoba's oil industry at the time, that a climate of growth was unassailable and opportunities would be secured by favourable, non-risky geological foundations and a permissive regulatory and fiscal strategy provided by the state.

However, everything changed in late 2015 when Manitoba, alongside Saskatchewan and Alberta felt the effects of a major downturn in oil prices (Cantaneo, 2016; Chohan, 2015; Hames, 2016). The causes of the decline are varied, but many commentators point to the glut in the global oil supply due to the efficiency of fracking and the corresponding drop in price: "Many international oil majors moved to Western Canada or bolstered their presence when oil and gas prices were expected to keep rising and global accessible reserves were thought to be in decline" (Cattaneo, 2016). In effect, the runaway productive success of the twinned technologies of fracking and horizontal drilling produced the economic conditions that have imperiled the economic feasibility of continuing production through the same process. As Cattaneo explains, the boost in fracking in the prairies coincided with favourable markets for Big Oil companies. Residents in southwest Manitoba were well-aware of the potential for these types of global economic forces to effect drilling in the area. As Ed from Virden explained: "So the risk is, and I guess this has happened in the previous oil boom, is the multinationals who don't necessarily have any large buy out potential, we are such a small operation, will just move or consolidate their operations." (Ed, 2014). As Ed and Cattaneo both understood, from widely different optics, that southwestern Manitoba is connected economically and geographically to the larger, more complex national and international extractive economies. In short, as Carlos Sica (2013) argued in his analysis of the Pennsylvania fracking economy, scale matters.

Figure 9 shows the rolling average for drilling rigs in Alberta and Saskatchewan. The graph shows a steep decline in 2015 and 2016, matching the recession experienced in southwestern Manitoba.

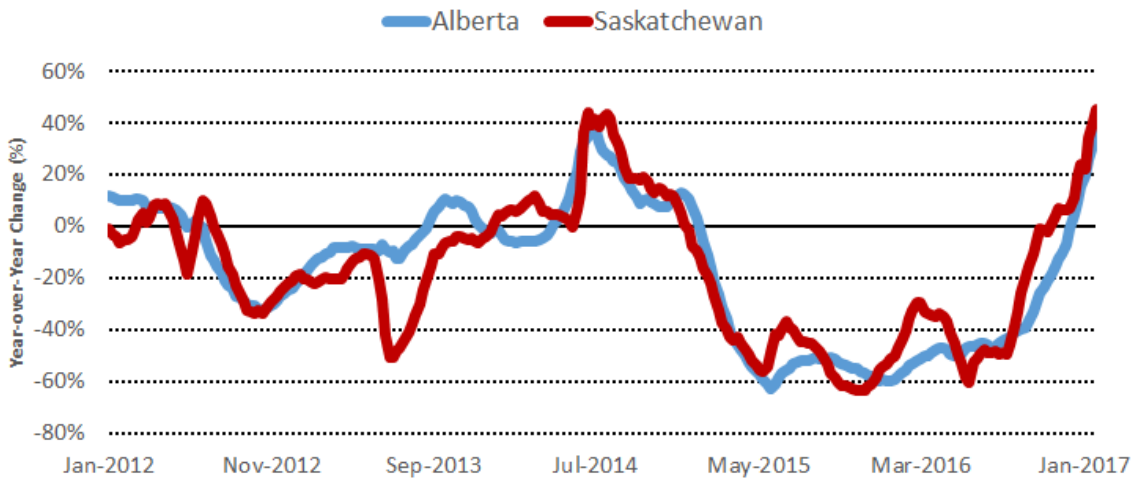

Figure 9: Year-over-Year Change in Drilling Rigs for Alberta and Saskatchewan (Tombe, 2017)

Again, the problem of information access for Manitoba's oil patch manifests here. Obtaining actual statistics about Manitoba's oil numbers is challenging because the Petroleum Branch has only released oil activity results up until 2013. In a 2016 article released in the *Manitoba Oil and Gas Review*, the Government of Manitoba Mineral Resources Department confirms that number of oil and gas licenses issued are in decline, with estimates of only 100 licenses issued during 2016 (Franner, 2016), a five- or six-fold decrease from the boom years. Interestingly, Figure 9 also shows a sharp incline in drilling in January 2017. At this point it is hard to predict the reasoning, but the increase may be associated to recently elected US President Donald Trump's confidence in the oil markets (Reuters, 2016), and the recent federal approval of Kinder Morgan's Trans Mountain pipeline and Enbridge's Line 3 replacement project (Trudeau, 2016).

Paralleling what occurred in the other oil producing prairie provinces, drilling declined in Manitoba because the cost of oil has fallen so low that it is no longer economically viable to extract. The technology of fracking had become too expensive:

> As soon as the margins are too tight, oil can't make a buck. That is when you witness the highly mobile part of the oil and gas industry because those guys leave town. That is massive. The void that is left behind can be seen in the housing prices. They push the housing prices up, and then you see a market flooded with homes. It doesn't take much to flood the real estate market in Virden or Melita or Reston. It can be ten homes. Then you go from getting top dollar for your home to being underwater and sitting on it for eighteen months waiting for it to disappear. (Anonymous, 2014).

As this person explains, the repercussions of fracking, both negative and positive, are felt beyond the direct job market.

On a local scale, a slowing oil economy has more direct personal results for the people of Virden. Some residents take solace in the juxtaposition between the ephemeral nature of the industry and permanence of the community in Virden:

> There is a core group in Virden that are 'Virdenites'. They might be from the whole area, but if the industry slows down, they are staying here. It is more of the transient workers that are going to drop. These are the workers coming in from Alberta or Saskatchewan that are here temporarily. (Steve, 2014).

The oil industry is highly mobile and so are its workers. As Steve explains, everyone involved in the oil industry will be affected by the inevitable downturn, but it is the 'Virdenites' who choose to stay in the community that have to deal with fallout of the social, economic and material realities of an oil bust. However, not all 'Virdenites' were blindsided by the downturn, some had the foresight to understand the risks of relying heavily on oil to develop a local economy:

> There is growth, but you hear a lot of comments about what about after the growth. And so we are trying to diversify the economy, but it is a bit of a struggle when you get so much pressure on the oil growth. Where do you find the time and money to look at other opportunities? But you have got to try to diversify your economy (Ed, 2014).

Ed, who works for Virden Economic Development, is tasked with overcoming an overreliance on oil while trying to expand the economic variety of the area, an unenviable task when everyone is focused on and benefiting from oil. Mayor Jeff McConnell speaks a similar message:

> Our goal is to try to find ways to maintain our population. There are other industries and other things around that we try to encourage. We want to get to a population base that is self-sustaining and does not have to rely on the oil industry. (McConnell, 2014).

As both Ed and Jeff have shared, there is a real danger in placing all of your trust in a fluctuating market. April confirms these sentiments by imagining what a 'post-oil-boom' Virden might look like, a town where oil has displaced commerce and civic life which might struggle to return:

> I see that there are a lot of jobs because of the oil but I also look downtown at what used to be business and shops, and now are filled with office spaces for oil companies. This concerns me a bit because in five to ten years when the oil industry is gone then we will kind of have a ghost town. Downtown will not be busy anymore because there will be a bunch of empty stores. (April, 2014).

April's imagined ghost town shares similarities of the realities of Virden in the present day. The real question though, is whether Virden's diversification plan was developed enough to help offset the current oil crash.

Alongside the stresses of the declining oil industry is an undertone of hope for Virden's future. Mayor Jeff McConnell tells the *Manitoba Oil and Gas Review* of his town's resiliency: "We call ourselves the oil capital of Manitoba, but the fact is that oil is not our only industry. Our community is so much more than oil, particularly at times like this when the oil industry is slow" (Franner, 2016). Residents of the rural municipality of Pipestone feel a similar economic crunch, but again, insist that the loss of oil jobs should be seen as an opportunity:

> During the oil boom, we noticed that it would have been beneficial to have some more service-oriented businesses here, like convenience stores and rental properties. This is still something we want to pursue. We also have some businesses for sale on our main streets, not due to the downturn in the oil industry but more related to retirement and succession. Therefore, there are new opportunities in the area of entrepreneurship as well." (Tanis Chalmers quoted in Franner, 2016).

Tanis Chalmers, who works in the municipality's economic development department, is in line with Liza Parks, an Economic Development Officer for the municipality of Deloraine-Winchester: "The slowdown in the oil industry provides us with a great opportunity for the new amalgamated councils to get together for strategic economic development." (Parks as quoted in Franner, 2016). As the future of petroleum resources continues to be in question globally, the local Manitoban attitude is to carry on with or without oil. This appeal to opportunity has the ring of a classic business nostrum in the face of a downturn, but it is clear that residents of southwestern Manitoba are struggling to rationalize the new economic realities of life outside the hydrocarbon boom.

Fracking in southwestern Manitoba: Implications of Big Oil in a small town

Throughout this thesis I argue that fracking is a network that forges people, economy and nature together. I understand oil as a hybrid fusion of the natural and social realms (Bridge, 2009; Castree and Braun, 1998; Demeritt, 2002; Willems-Braun, 1997). This network also expands geographically, connecting places through extraction (Braun, 2008; Huber, 2013; Tsing, 2011). These connections make it impossible to manage a fracking operation or produce oil and its externalities in a vacuum. Oil extraction decisions in one place ultimately correspond to oil extraction elsewhere, just as the effects of externalities are displaced across space. These decisions reached by producers, entrepreneurs, farmers and consumers ripple outwards affecting the lives and livelihoods of everyone connected to the hydrocarbon economy. As I have shown in my research, fracking in southwestern Manitoba follows this same pattern of scale.

I also argue that neoliberal resource extraction programs continue to shape our environment and communities to support the privatization and commodification of land to

facilitate access to buried fossil fuels (Castree, 2008; McCarthy, 2005; Mercer et al. 2014; Robertson, 2006). In Manitoba, the legislation produces a neoliberal framework. A top-down neoliberal governance structure displays local fracking as a technical and economic exercise, but I argue it can also be understood more broadly as a manifestation on the physical landscape and the way humans are connected to the natural world (Perry, 2012; Willow and Wylie, 2014). By examining the culture of fracking technology, I pull back layers to reveal a way of life unique to those living amidst the oil boom in southwestern Manitoba.

Ultimately, my research has produced more questions than answers. The resource community boom-bust (and potential boom?) pattern that oil towns in southwestern Manitoba are experiencing can be interpreted as predictable (Carrington and Pereira, 2011; Lawrie et al. 2011; Lockie et al. 2009). Communities that strike 'black gold' are warned of the dangers of investing too heavily into a finite and volatile industry, yet the chimeric promise of short-term prosperity often proves too good to pass up in favour of sustainable longer-term growth. The history of Canadian extractive economies can provide plenty of examples from the infamous Klondike Gold Rush of the late nineteenth century (Morse, 2009) to Manitoba's logging boom of the twentieth century (MB Historic Resource Branch, 2000). Despite the historical warnings, the allure of a resource based economy is still attractive to southwestern Manitoba.

Fracking connects southwestern Manitoba to the world in a complex and multilateral way. Just like my argument that fracking is so much more than the technical act of horizontal drilling and hydraulic fracking, downturns in the oil economy affect so much more than just jobs. For a community identity so deeply intertwined with oil, fracking is a means to a way of life. However, the oil communities of southwestern Manitoba seem determined to grow despite the changing economy. Ken Neufeld, the President of Manitoba-owned Tundra Oil and Gas spoke

recently to the *Manitoba Oil and Gas Review* about the future of his company: “I think we will be fairly well positions when things ramp up again. We’re very pleased with being able to keep everyone on board. There is no guarantee that we can do this indefinitely, but we’re all working together to try and make it happen” (Franner, 2016). As the president of Manitoba’s largest oil outfit explains, the attitudes of community members are willing to evolve as their collective oil identity changes. By looking for the opportunities in the downturn, fracking as a way of life may still continue, but the future, likely out of necessity, appears more diverse.

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Appendix A: Ethics Protocol Submission Form

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Summary of Project

Hydraulic fracturing has arrived in Manitoba. Although southwestern Manitoba has a history of small scale energy extraction, recent technology gains have enabled oil and gas companies to drill in formally inaccessible and uneconomic areas on the fringes of the Bakken Shale, the site of massive oil 'fracking' endeavours in Midwest US. It is estimated that1000 wells were drilled in Manitoba in 2013 alone, contributing to the 17 000 fracked wells in the province's history (LeNeveu 2013). Yet Canadian, and especially Manitoban, academic attention to socioeconomic impacts of fracking and horizontal drilling is lacking and this has reinforced misrepresentations of the industry. My study partially fills this gap by analyzing the regulatory framework, assessment regime and potential socioeconomic effects of new fracking technologies in Manitoba. I interrogate the ways that the mainstream understanding of oil and fracking has been socially produced, government regulations and the industry's role in communities. I look beyond fracking as a technical exercise, engaging with it as a situated lived experience (Hudgins and Poole 2014; Mercer et al. 2014; Willow 2014; Willow and Wylie 2014; Wylie and Albright 2014).

I will ask participants to answer a series of pre-selected interview questions on how they understand fracking and the way the process has impacted their lives. Depending on the length of their answers, the interviews will be half an hour to forty-five minutes. The interviews will be recorded using an audio device and the responses transcribed and analyzed after data collection. I will be using purposive qualitative sampling methods, including stakeholder sampling, maximum variation sampling, and snowball sampling to ensure the wide spectrums of attitudes towards fracking is represented. I am most interested in how these attitudes have been constructed, and

what they mean for people living amidst the fracking boom. By contacting people over the phone or through email, I will engage with policy-makers, technicians, administrators in the Manitoba Petroleum Branch, government employees in Winnipeg and stakeholders in Virden (the town at the centre of the fracking boom), community members, key stakeholders including oil and gas workers, local environmental groups, the Manitoba Water Caucus, and businesspeople. Participants will be encouraged to recruit others who may be interested in the study. All of the participants will be aware of the nature of my research and have the option to disclose as much identifying information as they feel comfortable with.

Research Instruments

The instruments I will need to conduct my research include an audio recorder that can be digitally locked with inception software, my interview questions and a notebook to take any field notes. See Appendix B for interview questions.

Participants

Since I will be using purposive sampling methods such as snowball sampling and maximum variation sampling, I do not have a prescribed description of the participants I will be interviewing. Purposive sampling means that I will be using qualitative research methods, focusing on the way that attitudes about fracking are constructed and the role that these attitudes have in the broader community. Maximum variation sampling means I will be striving to interview a wide range of individuals that expose the wide range of opinions I expect to find on the topic. Snowball sampling is a technique where participants recruit others by suggesting people they believe I might be interested in interviewing. I will search for initial participants by contacting key stakeholders in industry, government and non-government organizations through email or on the phone and asking them if they would be interested in participating in my study. Through word of mouth, I will be able to contact people that are perceived by others to be involved in the fracking industry. A copy of the script I will be using to recruit individuals to participate in my study can be found in Appendix 2. A copy of the recruitment script on the official department letterhead is attached to my ethics package. The only qualification that I will be using to screen participants is that they are either directly or indirectly connected to fracking

in Southwestern, Manitoba. However, since I am interested in filling a gap in information in the area, I may be including people who are unaware of the oil and gas activities in the area. I will predominately looking for people who live or work within southwestern, Manitoba, particularly in both Virden, and the surrounding rural communities such as Tilston, Melita, Souris, or Winnipeg. I do not suspect that any of my participants will be part of a vulnerable population (i.e. children, people with Alzheimer's disease, etc.), so no extra precautions will be needed. Although I will not know the exact numbers or descriptions of the people I will be interviewing until I am actually in the field, I will be aiming to interview between five to ten people that work in government and regulations around oil and gas, five to ten people who work in the fracking industry, five to ten people who live in the area and are impacted by fracking, and five to ten people that work in non-government environmental and public health organizations.

Informed Consent

All participants who agree to participate in my research will be required to read and sign an official informed consent form. The informed consent form outlines the purpose of the research, the expectations of the participants, any benefits and risks of participating, confidentiality agreement, withdrawing from the study, debriefing, and dissemination of information. Before participants sign their forms, I will verbally go over the above information with them, ensuring that they understand the information, and provide an opportunity to ask any questions or voice any concerns they may have. A copy of the Informed Consent Form has been attached to this email.

Deception

Not Applicable - there will be no deception used in my research project.

Feedback and Debriefing

There will be no formal debriefing after the interview; however, I will encourage participants verbally and in their Informed Consent Form to contact me through my University of Manitoba email address if they have any questions, concerns or comments about the research after the interview.

Risks and Benefits

The benefits of participating in this study include contributing institutional and community-based knowledge to the data deficient topic of hydraulic fracturing. Globally, there has been a lack of research undertaken on the socio-economic and political ecological impacts that fracking has on individuals and community members, though this is starting to change as the practice grows. The bulk of research has been scientific or technological, often masking the social impacts of this technology. The results from this study will be a valuable contribution to the growing body of human geographical research in this area. Nationally, the bulk of research on fracking has been focused in British Columbia and Alberta; where the technologies has rapidly expanded, and select high profile cases on the East Coast. Despite the ever-increasing number of wells being fracked annually, Manitoba has been relatively absent from academic and media attention. This study will chronicle the industry activities occurring in this area, helping open up information about oil and gas extraction in the province. Locally, I aim to broaden the scope of information available to the public, creating a platform for local voices to participate in the debate around Manitoba's energy future. I hope to contribute to the policy discussions as new regulations come into being.

Due to the potentially politicized nature of fracking, participating in this study may have economic and social consequences. Oil companies directly and indirectly provide a large number of jobs for people in the province. People may be afraid to share their opinions about fracking if they do not align with the goals of the companies and government. The threat of job loss or reprimand will be taken seriously. Speaking out against fracking may also be socially alienating, since many people benefit economically from the process. Because of these risks, all participants will be able to choose the level of confidentiality or anonymity for documentation. This might mean leaving names of people, businesses, organizations, locations, etc., out of my thesis, identifying participants in an encoded manner. The place and time of the interviews will also be flexible, allowing the participant to choose the most appropriate form and venue of communication. In person, over the phone and email interviews will all be options. All electronic data will be protected by inscription software, and hard data will be kept in a locked storage cabinet at the University of Manitoba. Through these methods, the social and economic risks of

participating in this study will be mitigated, and any identifiable factors included will be at the discretion of the interviewee.

Anonymity/Confidentiality

The data that I am collecting will be in the form of audio interviews. I will be recording the interviews using the Smart Voice Recorder App from Smartmob Development (2013) from my Ipad. In order to open my Ipad, a digital code must be entered. I am the only person who has access to this code. The audio interviews will be stored and analyzed from my locked Ipad. When the device is not being used, it will be kept in a locked storage cabinet in the key locked Centre of Environment Health Equity- in Wallace Building at University of Manitoba. I will be the only person accessing and transcribing the audio recordings. Participants will have the opportunity to choose the amount of personal information they want to reveal in the study. Interviewees will be able to remain anonymous by excluding their name, place of work, etc., or include however much information they feel comfortable with. I will have a conversation with participants about this, and it will also be explained on the consent form. Only after we have reached an agreement will the interview take place. Participants will also be able to change their confidentiality status at any point during or after the interview, until my research is submitted to my thesis committee. Once my thesis is submitted, all of the audio recordings will be destroyed, unless any of the participants choose to have a copy of their interview.

Compensation

Not Applicable - there will be no compensation provided to participants in my research project.

Dissemination

The information collected from participants will be used in my Master's Thesis, and presented to my University of Manitoba Thesis Committee. I do not plan on sharing my information with anyone else. After my thesis has been completed the information will be in the care of my Supervisor, Dr. Jonathan Peyton.

Appendix B: Interview Questions

1. What are your name, job title, and professional affiliation?
2. What are your primary duties in this position?
3. How long have you been with this organization?
4. How is your organization involved with oil and gas development and fracking?
5. How has your organization had to adjust to the increased shale oil development in southwestern Manitoba?
6. What is your general opinion of fracking?
7. How does your personal opinion interact with your company's stance on fracking?
8. What do you see as some of the opportunities and challenges that fracking creates in Southwestern Manitoba?
9. How does fracking in Manitoba compare to fracking in other provinces? Countries?
10. Do you feel you have been personally affected by fracking?
11. What perspective do you see coming out of the government on fracking at the municipal level? Provincially? Nationally?
12. How do you think fracking in southwestern Manitoba is influenced by statements/claims about fracking in other places?
13. How has your local community directly/indirectly benefitted from fracking?
14. How has your local community been directly/indirectly negatively impacted by fracking?
15. How do you think Manitoba as a whole benefits from fracking? Canada?
16. In what ways do you think fracking might impact human health in southwestern Manitoba?
17. In what ways do you think fracking might impact the environment in southwestern Manitoba?
18. How has fracking been represented in the community by the industry?
19. How has fracking been represented in the community by the government?
20. Where do you get information about fracking?

Appendix C: Recruitment Email

Dear Sir or Madam,

My name is Kaela-Mae and I am a Master's student in the Department of Environment and Geography at the University of Manitoba. I am working on a research project under the supervision of Dr. Jonathan Peyton.

I am writing to you today to invite you to participate in a study about the social and ecological impacts of hydraulic fracturing or 'fracking' in Virden, Manitoba. I will be examining the way the oil industry is regulated in southwestern Manitoba, including policies, environmental assessment and knowledge translation. By interviewing a variety of stakeholders, interested parties, and affected individuals, I hope to capture the diverse experiences, opportunities and obstacles presented by the recent oil boom.

This study involves one 30 - 45 minute interview that will take place in a mutually convenient, safe location. With your consent, interviews will be audio-recorded. Once the recording has been transcribed, the audio-recording will be rendered anonymous, and no information will be connected back to you.

While this project does involve some social and economic risks, care will be taken to protect your identity. This will be done by allowing you to choose the level of confidentiality of anonymity for documentation, only answering questions that you want to, and allowing you to request that certain responses not be included in the final project.

You will have the right to end your participation in the study at any time, for any reason, up until I submit my thesis. If you choose to withdraw, all the information you have provided will be destroyed.

You will not receive any compensation for participating in the interview. The benefits of participating in this study include contributing knowledge to the understudied by increasingly important topic of hydraulic fracturing in Southwestern Manitoba. This research will broaden the scope of information available to the public, creating a platform for local voices to participate in the debate around Manitoba's energy future.

All research data, including audio-recordings and any notes will be encrypted and password-protected. Any hard copies of data (including any handwritten notes or USB keys) will be kept in a locked cabinet at the University of Manitoba. Research data will only be accessible by me.

If you have any questions about this research or your role in the research please feel free to email me (hlushkok@myumanitoba.ca) or my graduate supervisor (Jonathan.Peyton@umanitoba.ca). This research has been reviewed and approved by the University of Manitoba Research Ethics Board and follows the Canadian Tri-Council Research Ethics guidelines.

If you would like to participate in this research project, or have any questions, please contact me at hlushkok@myumanitoba.ca.

Sincerely,

Kaela-Mae Hlushko

Works Cited

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