EDUCATION, COMMUNITY ENGAGEMENT AND OIL AND GAS DEVELOPMENT: NORTHEAST BRITISH COLUMBIA

by

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Abstract

Resource development projects offer economic opportunities to communities near operations, through the provision of jobs and corporate social responsibility (CSR) initiatives. When the local labour pool is not prepared, or lacks appropriate skills or education avenues for upgrades, labour demands will be filled by a fly-in-fly-out workforce. This system both draws resource benefits away from impacted communities, and incurs high transportation and lodging costs to the company. Improving labour-force quality will require upgrading education resources necessary for acquiring the appropriate post-secondary degrees and certificates for employment in the industry. Before planning education programs, it is important to have an acute understanding of the population's history, socio-economy, regional education resources, and perspective on local education and employment.

This research study examined the Northeastern, British Columbia (NEBC) region, where oil and gas (OAG) development is expected to increase exponentially in the near future with the use of hydraulic fracturing. Due to the specialized skills required for this industry, the local communities are currently ill equipped to participate in the labour boom. An education gap analysis was performed to examines the education disparities and obstacles for varying communities in NEBC. The study used a geographic analysis of regional education opportunities to identify community needs, followed by field work where in-depth interviews and focus groups brought to light local thoughts and perceptions on education, employment and community development. This information can be used by OAG companies to invest in socially responsible programs, that benefit regional communities as they develop the resource.

Preface

This Thesis was refined for use from a Mitacs Accelerate Internship with Calfrac Well Services Ltd. The research project aimed to provide an education gap analysis in Northeastern BC for use in designing tailored education programs that both met community needs and Calfrac capacity. The author, N. Botta, designed the methodological framework to include a geographic analysis of community access to education opportunities and targeted in-depth interviews with community experts in education and community development. The interviews were set up to obtain local thoughts and opinions regarding oil and gas development, education opportunities and community planning. The geographic data was analyzed using spatial analysis, school capacity and census data, while the interviews were analyzed using grounded theory with NVivo software.

The qualitative data collection and analysis involved human subjects and therefore was presented to the UBC Behavioural Research Ethics Board and The *Certificate of Approval – Minimal Risk*, was received on November 3, 2014; the reference number is H14-02491.

The findings from this research was presented to the CEO and board members from both Calfrac Well Services Ltd. and Progress Energy Resources for the purpose of education program development. It is anticipated that with final Mitacs funding this thesis will be presented to individuals from the study and/or interested groups in the study region.

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List of Abbreviations

BC	British Columbia
BHP	BHP Billiton
CBPR	Community-Based Participation Research
CIP	Community Investment Plan
CPR	Canadian Pacific Railway
CSR	Corporate Social Responsibility
CWS	Calfrac Well Services
FIFOW	Fly-in-fly-out workforce
FN	Fort Nelson
FNFN	Fort Nelson First Nation
HF	Hydraulic Fracturing
IBA	Impact Benefit Agreement
IIBA	Inuit Impact Benefit Agreements
HBC	Hudson's Bay Company
LNG	Liquid Natural Gas
NBK	Norman B. Keevil Institute of Mining
NEB	National Energy Board
NGO	Non-Government Organization
NWMP	North Western Mounted Police
NWT	Northwest Territories
OAG	Oil and Gas
PIMS	Pacific Institute of Mathematical Sciences
R&D	Research and Development
SALA	School of Architecture and Landscape Architecture
UBC	University of British Columbia
RDM	Red Dog Mine
RDP	Resource Development Project
RTA	Rio Tinto Alcan
SGM	SGM American Mining Company
SEA	Socio-Economic Agreements

Glossary

Census Data	A census is the procedure of systematically acquiring and recording information about the members of a given population. It is a regularly occurring and official count of a particular population.
Corporate Social Responsibility	Corporate social responsibility (CSR) is a business approach that contributes to sustainable development by delivering economic, social and environmental benefits for all stakeholders. CSR is a concept with many definitions and practices.
Deed to Surrender	With the Deed of Surrender in 1869 between HBC and Canada, the Company yielded sovereignty over its traditional territories to the new country.
Dominion Canada	Dominions were semi-independent polities that were nominally under The Crown, constituting the British Empire and later the British Commonwealth, beginning in the later part of the 19th century.
Education Quality	Refers to the level of cognitive ability attained from education, often evaluated through testing of student abilities in reading, writing, math and science.
Education Quantity	Refers to the amount of years achieved from primary, to secondary and post-secondary education stages.

Google Maps	Google Maps is a desktop web mapping service developed by Google. It offers satellite imagery, real-time traffic conditions (Google Traffic), and route planning for traveling by foot, car, bicycle (in beta), or public transportation.
Homesteaders	Refers to the agriculturalist communities that settled across western Canada following the Dominion Lands Policy, which offered free land for cultivators.
Impact Benefit Agreement	Mining companies negotiate impact and benefit agreements (IBA) in order to secure access to minerals on or near land claimed by Aboriginal communities through potential or established aboriginal or treaty rights.
Inuit Impact Benefit Agreement	Nunavut Land Claim Agreement requires that an Inuit Impact and Benefit Agreement be negotiated prior to the establishment of any new park in Nunavut.
Labour-Force Quality	Refers to the average level of 'education quality' in a population because individuals with better math and science skills can pursue careers in engineering and science for innovation, technology, research and development.
Nvivo Software	NVivo is a qualitative data analysis computer software package produced by QSR International. It has been designed for qualitative researchers working with very rich text-based and/or multimedia information, where deep levels of analysis on small or large volumes of data are required

Rights-Holders	A right holder refers to a legal entity or person with exclusive rights to a protected copyright, trademark or patent, and the related rights of producers, performers, producers and broadcasters. A right holder may license a portion or all of a protected work through international legal and licensing provisions. First Nations are rights-holders.
School-Flow Variable	The transition of students from elementary, to secondary to post-secondary education stages.
Social License to Operate	Generally, refers to a local community's acceptance or approval of a company's project or ongoing presence in an area. It is increasingly recognized by various stakeholders and communities as a prerequisite to development.
Stakeholders	Stakeholders can affect or be affected by the organization's actions, objectives and policies. Some examples of key stakeholders are creditors, directors, employees, government (and its agencies), owners (shareholders), suppliers, unions, and the community from which the business draws its resources.
Sustainable Development	Sustainable development is the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Triple Bottom Line	An accounting framework with three parts: social, environmental (or ecological) and financial. Many organizations have adopted the TBL framework to evaluate their performance in a broader perspective to create greater business value.

Acknowledgements

I am grateful for all the support I received during my Master of Applied Science degree and thesis project. I would first like to thank my supervisor and secondary supervisor Dirk Van Zyl and Scott Dunbar, for their confidence in my abilities and supporting my project despite the stretch from mining to oil and gas. There were bumps along the way, but you both stood behind me and assured me that my research was relevant, not only for mining, but all large-scale resource industries.

I acknowledge the unique and progressive MASc program offered at the Norman B. Keevil Institute of Mining. With a focus on the social and environmental side of industry, the program provides its students with the tools necessary to understand the role mining plays in society and mitigate negative externalities. I have yet to attend a conference proceeding or discussion panel related to environmental and social risks where I did not feel well informed, thanks to the excellent professors from our mining department. During my academic career, no instructor has made class more enjoyable and thought provoking than Dr. Marcello Viega, where each class was highly anticipated and always delivered laughter along with valuable information. Thank you, Marcello!

My thesis would not have been possible if it weren't for the Mitacs Accelerate Internship and my industrial partner Calfrac Well Service Ltd. I would like to extend my sincere thanks to Wally Kozak for being a mentor over the course of my internship, and making me feel welcome during my visits to heard office. It was a pleasure to meet so many wonderful people during my field work, including all the participants in the study. I am however especially honoured by Caleb for extending his home to me and taking the time to introduce me to his family and territory, the experience was unprisidented.

I am fortunate for the friendships in my life, however Callista, Kristina and Ruby were particularly supportive during the course my thesis work, lending an endless supply of encouragement and academic advice. I am lucky to have such brilliant women as best friends. I am also giving a huge shout out to my co-heart; Ali, Andre, Ben, Brandon, Garth and Zaraí for being so inspiring and hilarious!

My little dog Oryx has been at my side through the thick of it all, in class and through the late nights of writing. If it were not for her, I probably never would have taken necessary breaks.

I am grateful to my parents, who have always had an unwavering belief in my capabilities and never fail to let me know how proud they are of my achievements. Thank you, Papa, for being my rock; for teaching me through example to stay calm in the storm; for showing me how to see beauty in all of life's moments; for pushing me to be an artist AND a scientist; and for always laughing at my bad jokes.

Most of all I am grateful to my Mother, who has been my champion throughout the course of the program. Before applying for graduate school, I could not see myself in any specific field. I was interested in community planning, community health, transportation planning, geology, social work, travel, political science, art, history, graphic design, film…etc. My mother encouraged me to investigate mining because the field was increadibly diverse, and she knew I would enjoy it. She was right, I loved the program and the work prospects are very exciting! Thank you mum for never letting me lose faith in myself, and contantly pushing me to achieve my dreams!

For the first time in my life I feel like I am right where I am meant to be, heading in the right direction, and I am having all of you to thank for it.

CHAPTER ONE: INTRODUCTION

Resource Development Projects (RDP) have substantial social and environmental impacts in the regions in which they operate. Media attention on environmental degradation and community injustices have pushed corporations to include environmental protection and community development initiatives into their development plans, this movement is termed Corporate Social Responsibility (CSR). To gain a community's support, a company will provide incentives such as economic development through the provision of jobs, while investing in social welfare programs and public infrastructure, thus obtaining a social license to operate.

The problem with this strategy is that not all communities are equipped with the skills necessary to partake in available employment opportunities, nor do they have the education avenues necessary to upgrade. For this reason, education programs that improve high school graduation rates and access to post-secondary opportunities are excellent forms of community development. Education opens the doors for opportunity, flexibility and community resilience.

The Northeastern British Columbia (NEBC) region was developed relatively quickly, evolving from Indigenous territories into a resource industry hub in under a century. First Nations communities and settlers were required to adjust to resource demands, expanding transportation networks and population growth in a constantly fluctuating political climate. Technological advancements in resource exploration and extraction increased the scale and scope of output from the region, with a focus in agriculture, forestry, mining, hydro-electricity and oil and gas (Ray, 1996). As resource markets have fluctuated, so have employment opportunities and required skills.

The *British Columbia 2022 Labour Market Outlook* (2015) estimates that Oil and Gas (OAG) expansion through hydraulic fracturing (HF) will create 100,000 jobs between 2015 and 2022. LNG activities are divided into three streams; natural gas extraction and processing (upstream), pipeline transmission (midstream) and liquefaction and transmission (downstream). It is important to note that these estimates include the construction phase, and that employment demands will decrease as infrastructure is secured. Nevertheless, operations and upkeep of

infrastructure will continue to provide thousands of jobs. The forecast expects 58,700 direct and indirect construction jobs at the height of the construction phase in 2018 and 23,800 permanent direct and indirect jobs for operations by the end of the forecasting period. The difference in employment demands comes from support services and spin-off industries associated with increased economic development in the region (British Columbia 2022 Labour Market Outlook, 2014).

The LNG industry differs from other resource extractive industries in that employment opportunities are almost exclusively specialized, requiring trades certification and engineering degrees. Concerns about the educational capacity of local communities and their consequent ability to partake in the employment opportunities have been voiced by community members, government and industry. Without an adequate local labour pool, LNG development will be reliant on a fly-in-fly-out workers/workforce (FIFOW), which incurs high transportation and housing costs to companies while appropriating resource benefits from local people and communities.

Planning projects within the LNG industry is problematic because specialized operations are subcontracted to a multitude of subsidiary and private contractors, creating a mosaic of responsibility.[1] Furthermore, LNG uses numerous relatively small wells to extract natural gas, and this design has different impacts on local populations than do large-scale RDPs. Despite these challenges, oil and gas companies recognize the importance of employing local people, and investing in education programs is a clear choice for CSR projects.

This thesis reviews available education opportunities for communities around the Montney Gas Field, where LNG development is expected to increase in the near future,[2] highlighting education gaps for OAG companies to consider while planning directed-CSR programs focused on education. Information was gathered from government reports, industry reports, academic journals, census data, in-depth interviews and focus groups to provide context for the issue,

1 In contrast to Mining, where one company is responsible for CSR.
2 Exact dates have shifted due to oil and gas market fluctuations that began in the year 2015.

while in-depth interviews and community engagement strategies were used to illustrate the perceptions and concerns of the NEBC populace.

History informs the construction of social values and how the different communities have defined themselves, including First Nations, early homesteaders (agriculturalists) and those that have come as a result of resource developments. It is important to recognize the disparity between First Nations and non-First Nations communities in terms of social and economic stability. For this reason, special attention was paid to First Nations communities, where remoteness and lack of amenities are more prevalent.

First Nations communities have existed for centuries in this region and will continue to be an integral part of development in the area. Understanding their perspective on growth and respecting their cultural values is crucial in any sustainable economic development strategy, including education and employment strategies.

Purpose of the Research

The *British Columbia 2022 Labour Market Outlook* (2015) reported a labour expansion of 100,000 from 2018-2022 to support the growing LNG industry in NEBC. Throughout the extraction, processing, transmission, liquefaction and transportation phases, employment in direct and indirect operations as well as direct and indirect construction will be necessary. At present, however, there is a lack of education and training opportunities for locals to participate in the growing job market, pushing industry to rely on FIFOW.

Developing education programs appropriate for local employment opportunities in a multitude of industries is a fundamental aspect of the northern school boards' curriculum planning. However, according to multiple sources, youth in the community are not receiving the opportunities they need to work effectively within their home communities. Identifying these obstacles can provide OAG companies with an opportunity to invest in socially responsible programs that truly benefit regional communities as they develop resources.

The purpose of this research study is to determine an optimum directed CSR initiative focused on bridging gaps in education delivery to the NEBC population, by examining community access to education institutions as well as acquiring local opinions on community preparedness for expanding industry and employment demands. To explore these topics, a geographic analysis of regional education opportunities was performed to identify community needs. This baseline study was followed by field work where in-depth interviews and focus groups brought to light local thoughts and perceptions on education, employment and community development. The information derived from the study will aid industry stakeholders in developing education programs suitable for investment towards supporting sustainable community development around operations. Additionally, communities with higher degrees of need will be identified so that directed education programs can go towards those that will most benefit from extra assistance.

Geographic Evaluation of Education Access

Each community identified for the research study was examined for school accessibility and capacity at the primary, secondary and post-secondary phases. Data collected from this baseline work was cross-referenced with high school graduation, post-secondary degree equivalency and employment participation rates. This information was employed as a framework for the more in-depth community engagement stage.

Community Engagement

Time was spent visiting each community to learn the history, geography and experience face-to-face interactions with individuals invested in education and community development.[3] Additional time was spent as a guest in West Moberly Lake First Nation and Fort Nelson First Nation, learning traditional land use and aspects of the Beaver and Cree cultures.

Over the course of three months, twenty-one in-depth interviews and three focus groups with individuals working in NEBC for the Municipal Governments, Chamber of Commerce, School Boards, Ministry of Education and the Aboriginal Education Council were conducted. The

3 Refer to Appendix B for table including the dates, locations, interviews and events that were included in the community engagement & interview strategy from December 2014 – July 17, 2015.

sessions were recorded and transcribed for qualitative analysis using NVivo software and grounded theory used as the coding methodology.

Post-secondary education programs designed for LNG employment require specific prerequisites in math and science. The goals of the interviews were: 1) To understand how local people felt about population preparation for industry growth, 2) To determine the state of education in NEBC, and explore how to improve the quality of that education, and 3) To look at the retention of workers and the availability of additional local education upgrading opportunities.

Research Question and Objectives

The thesis question is as follows; *Can geographic analysis and community engagement be used to plan focused education programs, related to preparing a regional population for employment in a resource extractive industry?* The necessary criteria for answering this question will be framed in a case study looking at oil and gas development in Northeastern BC, and population preparedness for the labour demands. An education gap analysis was performed to highlight areas for possible support through industry funding initiatives.

The following are the research objectives;

1. Explore the evolution of CSR in the resource industry, and connection to community development around operations.
2. Relate community education access and training to employment opportunities at proximate resource development projects.
3. Examine how community access to education opportunities affects education attainment and employment participation rates in NEBC.
4. Investigate the thoughts and opinions of local experts in education and community planning on OAG expansion and population participation in the industry.
5. Propose education programs tailored to community needs suitable for OAG companies to implement as community development projects in NEBC.

Thesis Outline

This research paper will begin with a background study for the purpose of becoming familiar the geography of the region followed by a thorough outline of colonization and industrial development. The region developed quickly and local First Nations communities and early homesteaders were forced to adapt to a growing industry climate in less than a century. The fast paced industrial development is linked to the expansion of transportation networks in Canada and the world, which turned the Peace region into a resource extraction hub. Today, oil and gas development is at the forefront expanding industry; however, not all community members are comfortable with the environmental and social effects.

The paper covers how these developments have affected the economic prosperity of First Nations, as well as the role the Canadian government played in the eventual economic and cultural marginalization of First Nations, of which the effects continue to this day.
Following the contextual background, the paper will examine literature from pertaining subject matter relevant to the thesis, beginning with the evolution of CSR in the resource industry and the power corporations have to shape their host communities. The CSR chapter will weigh the pros and cons of varying CSR designs and community engagement strategies.

A brief description of education and economic development will be used to support the view that investing in quality education has a positive impact on communities. Resource extractive industries often operate in remote locations and require highly skilled employees. Considering the looming baby boomer retirement and decreased birth rates in the global north, labour projection experts warn that industry may struggle to attract skilled labour in the future. This information is relevant to the study as the authors outline strategies to attract and train employees during a labour crisis. Additionally, the literature explains the importance of hiring local people, a significant number of whom are indigenous.

A literature review on indigenous communities and industrial development complements the preceding description. Here, the causes and effects of indigenous oppression are framed and related to corporate interactions with communities, including employment recruitment, training

strategies. To highlight successes and failed attempts at integrating indigenous people into industry, a number of case studies are explored.

Succeeding the literature review, the methodological framework for performing an education gap analysis using geographic analysis tools and community based participation research and grounded theory will be explained. This outline includes the methodical limitations and ethics review for the study.

Community-based participation research is a highly revered method of community planning, one which involves building partnerships with local people and using local knowledge to shape development projects. This research study aims to follow these guidelines with the expectation that findings will evolve into on-the-ground projects, organized in partnership with community representatives and industry.

The initial data analysis looks at regional community access to education and uses distance, capacity and census data to examine the region for uneven distribution of elementary, secondary and post-secondary schools. This step acts a baseline for the researcher to grasp the circumstances of the region prior to visiting and performing interviews. Moreover, the information on community education needs acts as a framework for the final stage of this study, where bridges to education gaps are discussed.

A series of interviews and focus groups took place across the region and the qualitative data was coded and analyzed using grounded theory. This process draws out community thoughts and opinions on subjects relating to community development, education and employment. Furthermore, anecdotes and stories bring the subjects to life, as grounded theory materializes to form a narrative.

Results from the geographic analysis and grounded theory are cross-referenced together and with relevant literature, building a strong representation of the socio-economic environment in NEBC, community concerns relating to expanding industry, education deficits and action strategies that fulfill community needs relating to education and employment preparation.

Finally, the study examines limitations in the analysis of the data and discusses the significance of this methodology for performing a regional education gap analysis with the function of providing planning strategies for industry to apply in CSR initiatives.

CHAPTER TWO: BACKGROUND AND CONTEXT

Introduction

The primary source of data for this thesis consists of in-depth interviews with people from the NEBC region on the topics of oil and gas expansion using hydraulic fracturing (LNG), community development and education. To give context to individual perceptions and opinions it is important to understand the history of the region and the connection it has to settlement and industry. Those interviewed come from diverse backgrounds, some with long ancestral ties to the land, while others were recent immigrants. The purpose of this section is to highlight the major changes the region has undergone in the last century and a half, which have added to the current political atmosphere regarding social values, local economy and resource extraction.

Physical Geography

The NEBC Boreal Forest has a diverse ecosystem that has supported First Nations communities since time immemorial. Human activity has progressed throughout the region and has a visible adverse effect on the local habitat and wildlife. For example, Figure 1 illustrates that in NEBC the combination of road access and biodiversity reveals a noticeable correlation between human activity and decreased biodiversity. The less developed and protected areas west of the Alaska highway have much higher biodiversity, shown in green, compared to the more developed land east of the famous transit route, show in brown.

The NEBC region is remote and communities are dispersed over a large area. This is demonstrated in Figure 2, which shows major towns, First Nations Communities and road networks. Additionally, driving time between communities is depicted in Table 4, which highlights the more isolated communities and townships. Other notable features in Figure 2 are the rivers, water bodies and National Parks. The Peace River, which runs along the highway from Fort St John to Hudson's Hope can be seen as altered by the W.A.C Bennett Dam, before entering Williston Lake.

Traditional First Nations territories are complex. Treaty agreements used western geographic tools, such as borders and maps to classify the First Nation groups for management. Grouping

families together to simplify the process of Treaty rights has complicated land claims and relationships between First Nation communities and the Canadian Government. Figure 3 is based on a loose understanding of traditional territories, while Figure 4 is a historic representation of Treaty 8. These maps are meant to exemplify how the dynamic governance of land and access to Treaty rights between Bands is not sufficiently represented within western political geography. It is important to note that not all the Bands are represented in the Figure 3 maps, both of which were retrieved from government sources.

The following figure is adapted from two maps, a geographic map of Northeastern BC found on the Yukon tourism website (www.yukoninfo.com), and *The Status of Biodiversity in British Columbia* from the Biodiversity BC website (www.biodivercity bc.com). The presence of roads and thus human development have shown to have a negative correlation on biodiversity in BC. In order to illustrate this concept, the maps were overlaid to exemplify how the protected and less developed areas west of the Alaska highway remain rich in biodiversity (green colours) compared to the areas of intensified resource development to the east (brown colours).

Figure 1: Human Activity and Biodiversity in NEBC

The figure below depicts a map found on the Yukon tourism website (www.yukoninfo.com), indicating major towns, First Nation communities, roadways and major environmental features in NEBC (www.yukoninfo.com).

Figure 2: Northeastern BC Region

The next figure shows two maps, from left to right; a map depicting First Nations groups of British Columbia (Indigenous and Northern Affairs Canada, 2016) and a map showing First Nation Traditional Territories and Protected Areas in BC (Aboriginal Mapping Network, 2016).

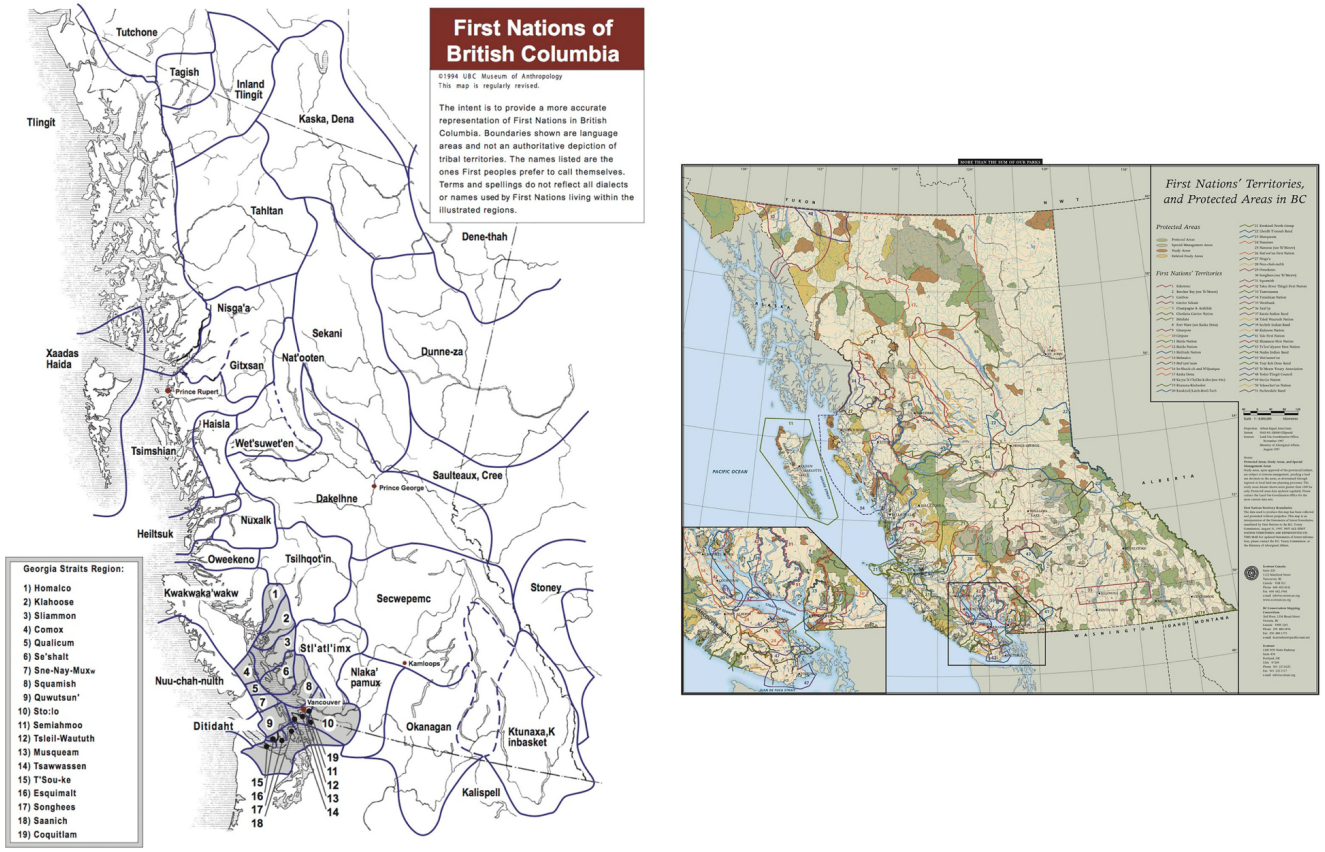


Figure 3: First Nation Groups and Traditional Territories

This figure shows an original map of the Treaty 8 Tribal Territory from 1900. The map was retrieved from the Fort Nelson First Nation Lands Department (http://lands.fnnation.ca/).

Figure 4: Department of Indian Affairs Treaty 8 Territory, 1900

Settlement and Development History

Since time immemorial, First Nations communities inhabited the regions now known as NEBC and the Athabasca basin. This includes the Beaver tribe, Slaveys, Yellow Knives, Caribou Eaters, Dog Ribs, Chipewyans, Crees and Metis (Ray, Miller, & Tough, 2000). Generally, the First Nation communities have seasonally migrated throughout their territories, hunting, fishing, trapping, gathering, and partaking in ceremonial events. The First Nations had complex governance over land-use, family politics and trade.[4] Disputes among different families led to conflict and occasionally erupted in violent acts of war (Ray, et. al., 2000). Past grievances between different First Nations groups have played a part in the evolution of the political climate in NEBC and Canada.[5] While western settlement resulted in further conflicts over resources and land, it also introduced an opportunity for trade and relationship building with a new population of people.

The Fur Trade

The Hudson's Bay Company (HBC) was incorporated under the English Royal Charter in the 1670s as a means to explore and harvest furs from the uncharted territories of North America (HBC Heritage Corporate Collections). The company was an agent of Great Britain and acted in place of a government throughout the Northern territories (Ray, et. al., 2000). The HBC controlled the fur trade with the provision of goods and certain securities, such as medicine and emergency food supplies, to its employees through a network of trading posts (Ray, et. al., 2000). Western traders and trappers formed strong allegiances with indigenous populations who were an integral component of the operation (Ray, et. al., 2000).

The fur trade was not sustainable and by 1850, the depletion of game throughout Canada caused concern for the industry and the livelihood of those dependent on the animals for food and income (Ray, et. al., 2000). To protect the industry, George Simpson, the Canadian Governor of the HBC, controlled hunting licenses, issued hunting bans, laid-off 60% of the workforce, shut down unproductive posts and produced cheap goods to sell to trappers (Ray, et. al., 2000). These

4 Tribes were smaller and more individualistic compared to the communal relationships of the prairie people (Ray, Miller, & Tough, 2000).
5 Disputes over hunting grounds with rivaling band (Ray, et. al., 2000).

changes were the beginning of a downward spiral for the economic livelihood of many First Nations people in the region. George Simpson successfully brought back the beaver from depletion; however, by that time, felt hats had been replaced by silk hats in the European fashion industry, and beaver pelt prices never recovered (Ray, et. al., 2000).

The Dominion Canada and Treaty 8

The earliest Treaties (1 to 7) were established in Canada from 1872-1877 and were derived from a necessity to convert the rich grasslands of the interior into agricultural land and develop "Nation building project, such as the transcontinental transport and communication networks" (Ray et al., 2000, p 148).[6] Furthermore, they met the Government's agenda to populate the interior. In contrast, Treaty 8 was originally perused by First Nation communities in the Northeast to assure security of their Aboriginal rights in a land overrun by homesteaders and prospectors (Ray, et al., 2000). Likewise, they demanded the protection of their well-being as subjects of Canada as they faced hardships caused by the westward migration.

North Western Mounted Police (NWMP) recorded the depletion in fur bearing animals in NEBC due to the trapping industry in an inspection report in 1897 (HBC Inspection report, 1897). The report described the lack of game as "critical" and the negative effects on the indigenous populations, who were suffering from starvation and disease, as "severe" (Ray, et al., 2000).[7] At this time, indigenous communities requested a Treaty that would provide annuity for necessary provisions, and medicine for their survival. The government held off on a Treaty on the basis that the land in the Northeast was not considered valuable for settlement and the activities at the time would not encroach on Aboriginal Rights. Furthermore, the responsibility for the destitute situation of the Fist Nations was ambiguous and disputed between HBC and the Dominion Canada following the Deed to Surrender.

The Canadian Government argued that although the Deed to Surrender relieved HBC from responsibility for the people in the region, they were still accountable for their employees. Since Canada was not actively settling the west, and thus not encroaching on Indian Land for the

6 For a more detailed account of early treaty negotiations refer to the article *Bounty and Benevolence: A History of Saskatchewan Treaties* (Ray, et. al., 2000).
7 Measles, croup and influenza were introduced during settlement (Ray, et. al., 2000).

public good, Treaty negotiations were not endorsed. Additionally, it was argued that the fur trade was still active in the Northeast and the transfer of land to Canada had not disrupted business for the Company, nor had the Dominion benefited yet from the deal (Ray, et. al., 2000). The HBC was under threat of bankruptcy from dwindling stocks and fur prices, as well as competition from new smaller companies unwilling to share to overhead cost of social programs, and thus did not want the responsibility of taking care of an impoverished population (Ray, et. al., 2000).

An influx of Homesteaders migrated past the prairies and began settling in the Peace River area around 1896 (Swainger, 1998). This relatively small, persistent agricultural community was not disruptive to the local traditional livelihoods. However, their numbers combined with the onslaught of prospectors and outfitters chasing the Klondike gold rush caused Indigenous populations to become anxious (Swainger, 1998). Many prospectors were disrespectful of the First Nations and the land, killing horses and hunting dogs, destroying traps and lighting fires (Swainger, 1998). The British Columbian government did not respect Aboriginal rights, giving prospectors Mining Licenses without the consent of the Federal Government or local Indigenous populations (Swainger, 1998). This caused alarm to those First Nations who felt a Treaty would regulate land use and provide insurance for loss of Aboriginal access to rights caused by the expanding homesteads and the insurgence of new people.

Valuable mineral deposits were uncovered in the Mackenzie River basin, which drove Canada to propose Treaty 8, exclusive to the Athabasca region in Alberta (Ray, et. al., 2000). Building a transportation network and providing settlement would be a necessary step in developing the mineral resources. Treaty negotiations were tense because it was thought that mineral exploration and development would be less invasive than other public works, such as farming, and therefore the annuity should be less (Ray, et. al., 2000). The First Nations had their hesitations as well; they were concerned about being placed on reserves, as they were a seasonally migrating people and not accustomed to communal living (Ray, et. al., 2000). Furthermore, they wished to have adequate medicine and education for their families, be exempt

from tax and not forced into military service (Ray, et. al., 2000). After a short trip to the region to visit the communities, the commissioners negotiated Treaty 8.[8]

Across the border in British Columbia, tension continued to rise between First Nations and settlers. The Indigenous leaders made it clear that "in the absence of a Treaty they did not recognize the authority of Canada" (Ray, et. al., 2000, p.168) and were willing to take up arms to defend their territory. This threat, combined with the growing mineral potential of NEBC, convinced the Government to include these Nations to Treaty 8 in 1900.[9] The NEBC Bands believed that their Aboriginal rights would be same as those of their neighbours. Unfortunately, the province of British Columbia used the ruling in the *Precious Metals Case,* preventing any members of Treaty 8 in BC to have mineral or oil and gas rights (British Columbia Legislative Assembly, 1889). In 1996, the Doig River First Nation, who are situated over the Montney Shale Gas Reserve, won a settlement of 147 million dollars for the deceitful management of their resource rights, causing them to lose millions in resource benefits (Ridington, 2013).

As revealed by the *Truth and Reconciliation Commission of Canada* (2015), it was conceived by the government that the solution to marginalization was assimilation, would benefit First Nation people and resolve land issues, resulting in a "cultural genocide" (Truth and Reconciliation Commission of Canada, 2015, p.1). Cultural activities and expressions such as community gatherings and weddings were outlawed; as these events doubled as social and trade events, the laws further stunted the economic livelihood of the communities. In 1920, an assimilation tactic was issued through the Indian Act, which focused on removing children from their families and forcing them into Residential Schools where their culture was physically and emotionally beaten out of them. The last residential school in BC shut down in 1996; however, the legacy of this traumatic legacy continues to this day.

Early Industrial Development

Early immigration to the Peace River was deterred by a lack of transportation corridors up until the 1930s (Swainger, 1998). The two original routes departing from Edmonton to the Peace

8 The period of time set aside to negotiate Treaty 8 was impossibly short, preventing many First Nations from contributing to the discussion and results (Ray et. al., 2000).
9 Refer to figure 4 for a map of Treaty 8.

Region took roughly three weeks with good weather conditions. The first used the Athabasca and Lesser Slave Rivers to arrive at Lesser Slave Lake, where goods and people traveled overland to the Peace River to disperse along the riverbanks. The second route traveled to Edson and then North to Sturgeon Lake, Grand Prairie, Pouce Coupe and eventually Dawson Creek (Swainger, 1998).

The journey was significantly reduced with the completion of the railway from Edmonton to Dawson Creek in 1931, where a network of gravel roads eventually sprawled out over the next decade, covering the region (Swainger, 1998). It was documented at the time that the settler communities of the Peace idealized their "family, farming, and pioneer morality" (Swainger, 1998, p.25) and were not welcoming of the "mechanization and modernization" (Swainger, 1998, p.6) era that followed improved transportation. However, as Swainger has argued, there is a direct correlation between the improved transportation networks and the industrial development in NEBC.

During World War Two, the Americans built a highway linking Alaska to Dawson Creek for strategic military purposes (Wedley, 1990). At this time, the economic potential of the region was fully realized, however insufficient funds and employees limited development until after the war (Wedley, 1990).

The groundwork for the Northern Development Strategy began in the post-war period, organized by the Liberal-Conservative coalition administration, who saw the "economic, social and political benefits" (Wedley, 1990, p.58) that could be gained. Northern expansion was supported by government policies and promotional incentives, including transportation infrastructure (Wedley, 1990). The post-war era introduced an influx of economic investment and labour into the area that quickly lead to an industrial boom (Wedley, 1990). People from across Canada and returning veterans migrated to the Peace in search of employment and prosperity (Wedley, 1990).

Table 1: Population Growth in Northeastern British Columbia 1921-1951

	Years			
	1921	1931	1941	1951
NEBC Regional Population	2,144	7,013	8,481	14,349
Dawson Creek Population	No Data	No Data	518	3,589
Fort St John Population	No Data	No Data	No Data	884

Source: (Swainger, 1998)

Completing the transportation network was a primary goal; construction both provided employment and encouraged settlement. Completing the Peace River Highway (John Hart Highway) connected Southern BC to the Alaska Highway and prevented Alberta from appropriating the economic benefit associated with the connectivity (Wedley, 1990). Furthermore, the provincially owned Pacific Great Eastern Railway (PER), which had fallen into economic decline, was bought by the Canadian Pacific Railway (CPR), expanding its route from Prince George to Squamish in 1949 (Wedley, 1990).

Technological improvements further enhanced the economic viability of resource extraction in the Northern region, including agriculture, forestry, mining, oil and gas and hydroelectricity (Wedley, 1990). The Peace was originally staked out for its agricultural potential, which continues to play an important part of the local and regional economy, accounting for 90 percent of the BC grain harvest. Farmland has been passed through the generations, and the farming community makes up a large portion of the population (Wedley, 1990).

The lumber industry emerged during the post-war era as the housing market in the US exploded and the newly opened Panama Canal made eastern American and European Markets accessible (Swainger, 1998). Prince George and other forestry centres erected massive sawmills and paper and pulp mills. Large-scale mining projects ensued, including processing plants and spinoff metallurgical, fertilizer and chemical industries (Wedly, 1990).

These developments required high levels of electricity and the hydroelectric potential of the Peace was harnessed with the W.A.C Bennett Dam (Wedly, 1990). Unfortunately, this endeavour was poorly managed, resulting in environmental degradation and displacement of the Tsakene and Kwadacha First Nation Communities (Ray e al., 2000).

In 2012, Northern BC accounted for the majority of provincial resource exports. The mining sector is responsible for almost 30 per cent of the province's exports; coal, copper and molybdenum make up the bulk of the materials mined in the area and gold, silver, lead and zinc are also of significance (Wedly, 1990). BC is one of the largest natural gas producers in the country; and hydroelectricity is the province's largest source of electrical power generation. This abundance of energy resources gives Fort St John the name "energetic city."

Technological advancements in horizontal drilling and hydraulic fracturing (HF) have made abundant reserves of Liquid Natural Gas (LNG) throughout North America available. Due to the economic viability of this resource, production has increased drastically over the last ten years. In 2012, the Government of British Columbia released the *Liquid Natural Gas: A Strategy for BC's Newest Industry* report, outlining its vision to considerably increase provincial natural gas production and exports. Due to the abundance and overproduction of the resource throughout North America the strategy aimed to claim Asian markets by piping the LNG from the Northeastern interior to western coastal plants, where it could be shipped overseas.

OAG Development and Impact on Treaty Rights

Despite concerns over environmental implications, the benefits of developing the resource responsibly would positively impact many lives in NEBC. For this reason, some Bands have signed development agreements with companies involved in the development, production and

transportation of LNG (Hunter, 2015). Other Bands are strictly against OAG expansion, because of the unknown long-term environmental effects of hydraulic fracturing (HF) and the possible threat to their Treaty rights. The resource economy culture is strong in the region, on Reserves and in towns alike, so one might question why this industry represents a greater risk in the minds of Northerners than other industries. One reason LNG is so contested is due to the lack of research, regulation and planning for the scale of the growing assembly of small wells.

Furthermore, provincial regulations and environmental assessments are not tailored to this new fast paced industry (Garvie, 2015). Because gas development contracts can overlap traditional territories and undeveloped crown land, and occur near human settlements, people are anxious about the cleanliness of the water and the health of surrounding ecosystems and their community members (Garvie, 2015).

Regulations used for conventional oil and gas (pipelines and gas processing plants) are not applicable to HF because the operations and impacts are very different (Garvie, 2015). There is a widely accepted concern that LNG is being developed far too quickly, before any proper environmental assessments or regulations can be used to mitigate harm. Figures 5 and 6 illustrate the exponential growth of LNG development near Fort Nelson First Nation and coinciding water extraction for use in HF. Baseline studies on threats to wildlife, water use, water contamination and air emissions have not been conducted and therefore the upstream, midstream and downstream effects of current and future OAG development are unknown.

Traditional knowledge about territories where LNG is operating attests to severe changes in wildlife and water systems. These concerns have been reported by First Nations and overlooked by authorities due to the lack of previous 'scientific research'[10] to prove changes have occurred or are caused by LNG specifically (Garvie, 2015). Additionally, it has been argued that expansion of the industry has proceeded in traditional territories without proper consultation with Bands.[11] Activities that threaten existing wildlife and natural systems directly affect Treaty rights and the right to hunt and partake in traditional land-use. Any activities that impede on those

10 Considered more factual than oral histories.
11 The Fort Nelson First Nation were not consulted during on-going transactions from 2005 to develop LNG on their territory until 2012, when it directly affects their treaty rights (Garvie, 2015).

rights should be met with acceptable consultation, accommodation and necessary agreement on compensation for affected Bands.

The following 4 figures show increased oil and gas activity using haudraulic fracturing in the Norhern Peace region from 1959 – 2013. Industrial activity includes oil and gas wells, water withdrawl wells, petrolium access roads, seismic lines, well sites, pipiline right of ways, oil and gas facilities and ancillary and other features. These maps were retrieved from the Fort Nelson First Nation Lands Department.

Figure 6: Liquid Natural Gas Activity in North Peace, 1959

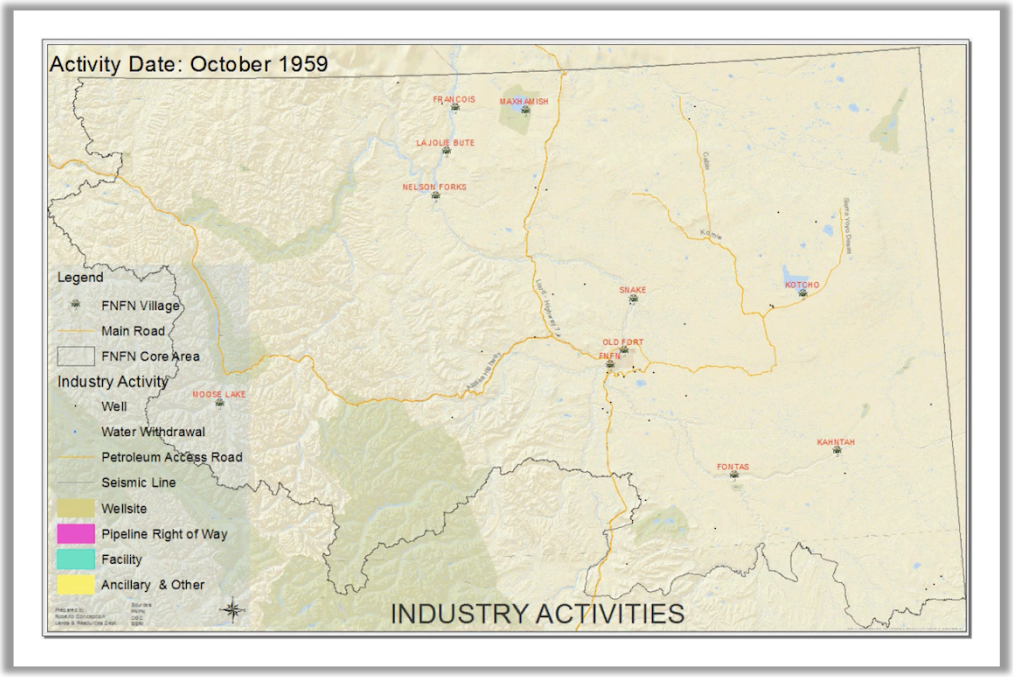


Figure 5: Liquid Natural Gas Activity in North Peace, 1995

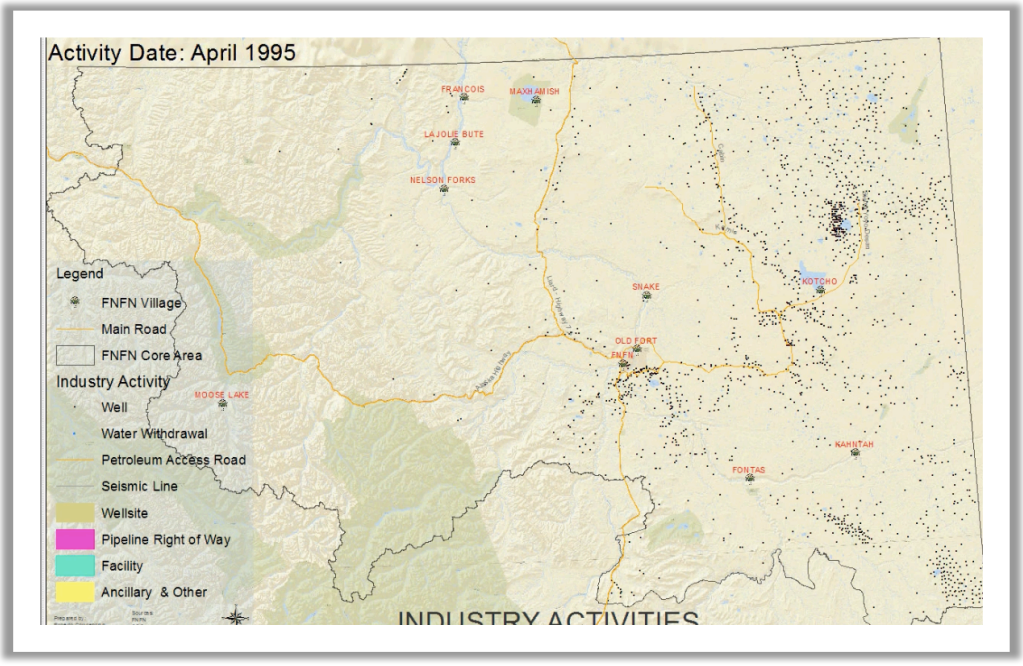


Figure 8: Liquid Natural Gas Activity in North Peace, 2005

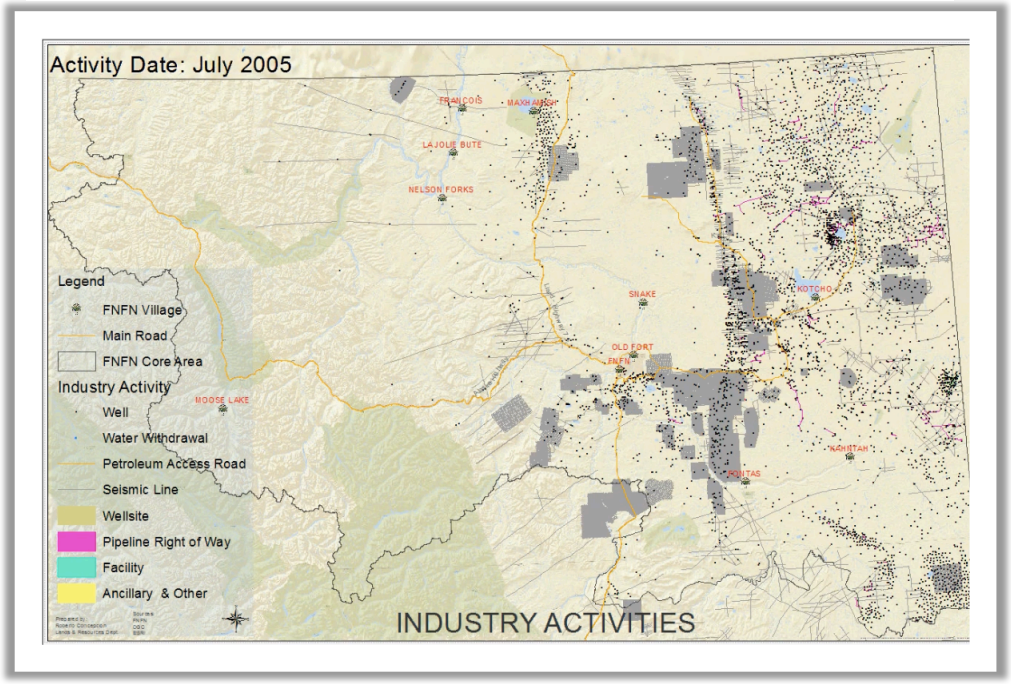
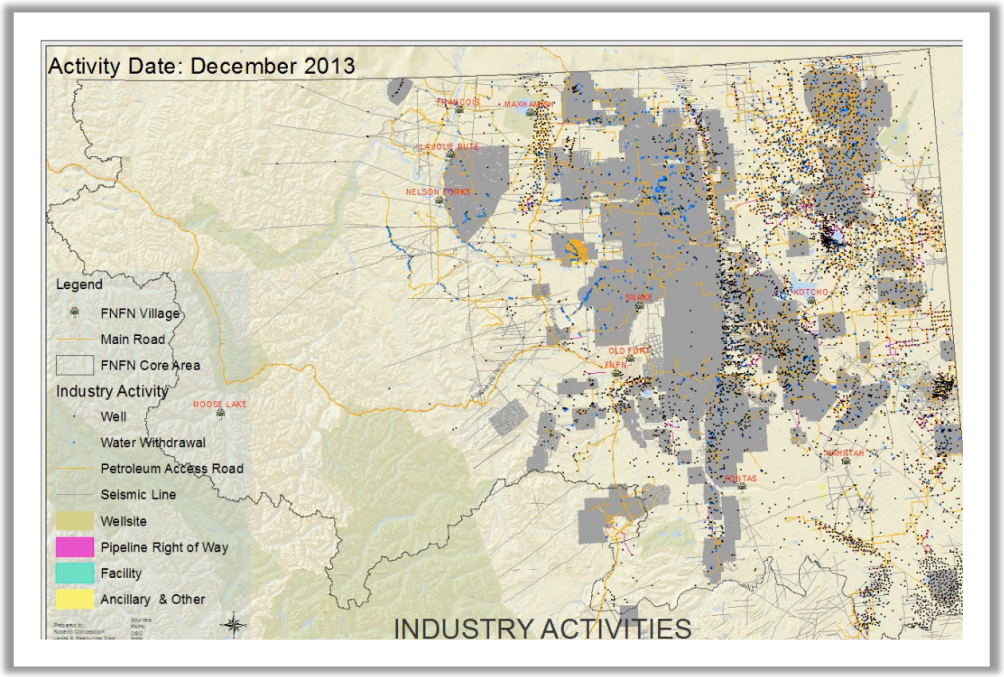


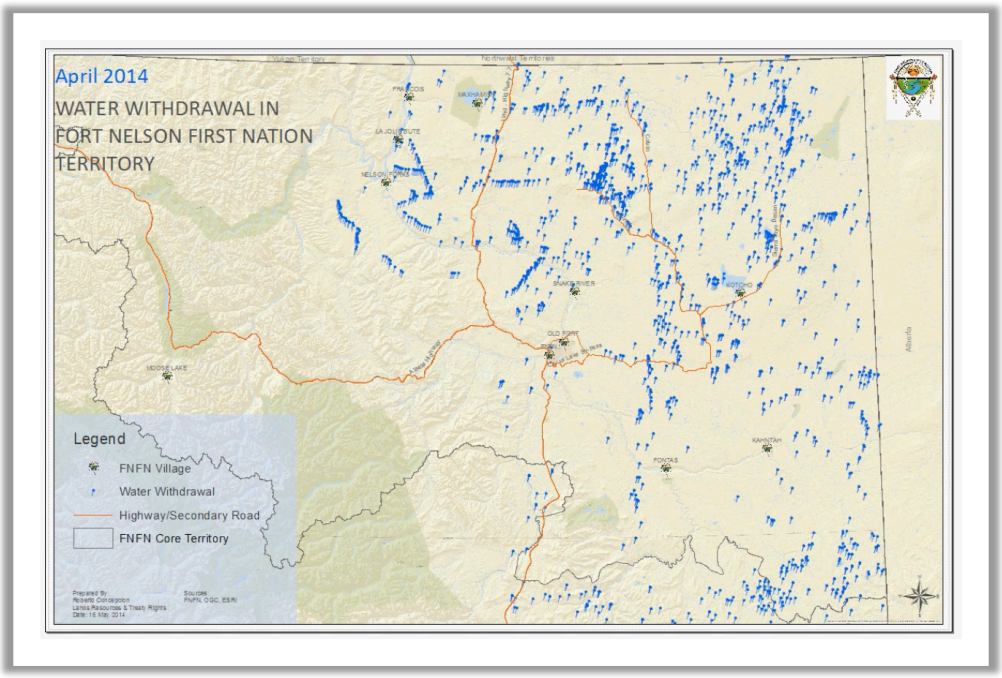
Figure 7: Liquid Natural Gas Activity in North Peace, 2013



Hydraulic fracturing uses large quantities of water, and therefore a serious environmental concern is how this water usage will affect the local ecosystem. The following maps show increased water withdrawal in the Northern Peace region from 2006 – 2014. These images were retrieved from the Fort Nelson First Nation Lands Department.

Figure 9: Water Withdrawal in Fort Nelson First Nation Territory, 2006

Figure 10: Water Withdrawal in North Nelson First Nation Territory, 2014



Below is a map showing the major natural gas reserves in NEBC, the Montney Basin in dark brown, the Horn River Basin in light brown, the Liard Basin in light blue and the Cordova Basin in light green. This mapped was retrieved from the Natural Resources of Canada website, and originally sourced from the BC Oil and Gas Commission**.**

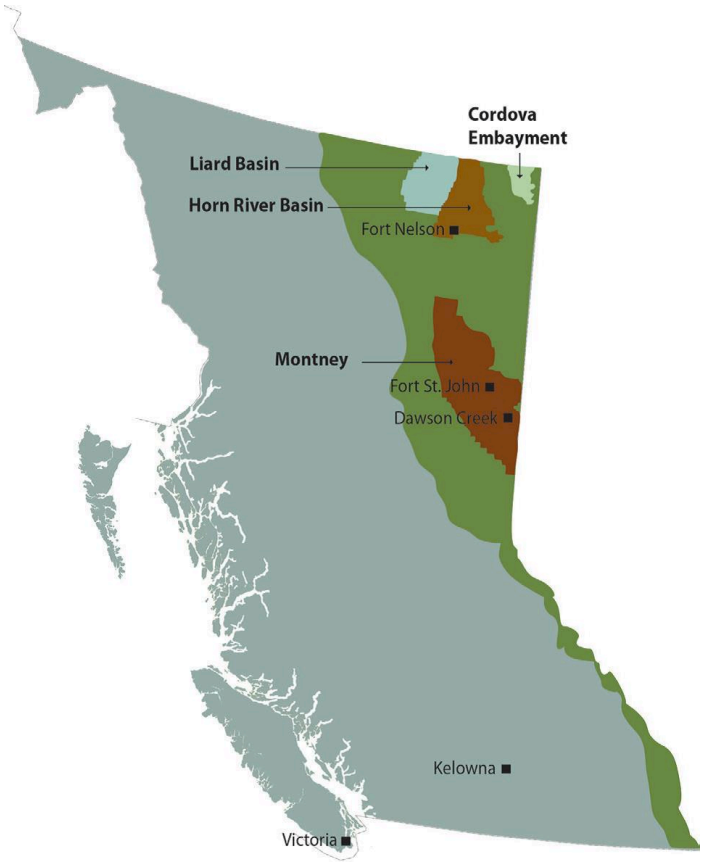


Figure 11: Unconventional Gas Play Trends in Northeastern British Columbia

Finding a balance between economic equity in a resource economy and values that protect nature and the environment is a difficult task. During interview sessions with locals the desire for jobs and resource benefits were weighed against the unknown harm of developing OAG using HF. Assessing, understanding, and mitigating cumulative effects should be an essential precondition for the LNG industry. These measures will ensure the protection of the ecological environment and social resilience of the region, including the constitutionally protected Treaty rights of the Treaty 8 First Nations, whose territory LNG development will impact the most.

Managing and mitigating the risks involved in ramping up OAG production will be challenging to stakeholders and rights holders alike. One critical component in the planning process is improving engagement and consultation with Northern Communities and First Nations. Respecting local knowledge and taking concerns seriously will contribute to the development of a more sustainable and stable resource. Stakeholders in the industry recognize the necessity for proper baseline studies, and monitoring programs. This additional work could offer local people ongoing employment opportunities throughout the life cycle of the industry.

Closing Comments

Historically, First Nation communities in NEBC have been systematically marginalized, both physically and socially, as a result of colonization and government oppression. Physically, traditional land and access to Treaty rights has been limited by settlement and crown land development projects. Socially, since the time of homestead immigration and the monopolization of the agriculture industry by settlers of European extraction, First Nation people have not had equal access to economic opportunities. The Canadian 'Indian Policy' prevented First Nations from acquiring the land necessary for inclusion in this profitable industry. It can be argued that during Treaty 8 negotiations, the degree of development that would occur in NEBC as a result of expanding transportation networks was unknown, and therefore agreed compensation for lost land was insufficient.

First Nations communities across Canada and in NEBC are socioeconomically disadvantaged. Remote communities have less education options and medical care. That scenario, coupled with

systemic violence and abuse cause by Residential Schools, has fractured families and community relations, further preventing individuals from accessing the Canadian right to equal opportunity. These obstacles have made integration into wage earning positions more difficult. In NEBC, employment in the resource industry has mainly come from mining, forestry, hydro-electricity and OAG, with subsistence income from hunting activities. Unfortunately, these jobs have been, for the most part, limited to entry level positions due to a lack of skills and/or discrimination. Supporting indigenous self-determination will require continued access to Treaty rights: however, the accumulation of large-scale resource development projects and LNG expansion threatens habitat and wildlife.

Currently, the exploration and development of LNG has put strain on the land, with noticeable effects documented by First Nation Elders. The proposed three-fold increase in production will have further unknown impacts, stressing the local ecosystem and threatening access to country food and traditional livelihoods. Addressing First Nation concerns and working with local experts to mitigate harm will not only help reduce negative environmental externalities, but will support sovereignty while building trust and equality.

CHAPTER 3: LITERATURE REVIEW

Introduction

This literature review examines the role resource extractive industries play in community development. Through the provision of jobs and other corporate social responsibility projects, companies can have a sizeable influence on the socio-economic progress of nearby communities. Not all communities are prepared for employment opportunities. However, to avoid dependence on FIFOW, companies may opt to invest in education and training for local people, using CSR or other funds, thus securing a local workforce and ensuring resource benefits are circulated in the community. Remote operations often rely on the support of nearby indigenous communities for a labour and a social license to operate. Attracting, training and retaining indigenous people can be challenging, as will be discussed later in this chapter.

The literature review will explore this subject matter by exploring what motivates CSR, the significance of education for economic development; employment deficits in the resource industry, skills upgrading and training for employees, and Indigenous recruitment, training and retention at RDP. It is important to note that while the research study undertaken in this thesis is focused on oil and gas development in NEBC, the paper was submitted to the Mining Department at UBC, and therefore an emphasis on resource development and mining was used in this literature review. The topic of education and community job readiness is relevant for large scale resource development projects including oil and gas and mining.

Evolution of Corporate Social Responsibility (CSR)

International corporations began to receive negative coverage in the media during the 1970s for their unethical activities in the global south. Campaigns were established to "name the shame" (Pillay, 2015, p.18) of companies involved in socially and environmentally irresponsible behaviour for economic benefit (Pillay, 2015). The business of CSR has since evolved to promote corporations as benefactors to local communities, assuring socio-economic development and environmental protection. The term 'triple bottom line' was adopted in 1994 by the corporate world to describe their 'sustainable development' initiatives as economically, socially and environmentally responsible (Pillay, 2015).

In the mining sector, companies operating in remote locations found that social programs and local employment strategies fostered positive relationships with local communities conducive to peaceful operations[12] (Botta, 2014). Furthermore, investing in the training of local people for employment reduced the expensive transportation costs of importing labour. It could thus be argued that the movement towards social welfare interests was not motivated by philanthropy, but was an economic maneuver to reduce costs and risks for operations.

From this viewpoint of self-interest, companies branding themselves as 'socially responsible' are seeking public acceptance and political legitimacy in the global eye, hence protecting their business and shareholder interests (Pillay, 2015). This is not to say that CSR initiatives have not had a positive impact on local communities, alleviating poverty while improving health, education and public infrastructure. Furthermore, upholding shareholder "values" as good for society cultivates partnerships between governments and business for socio-economic development at international and regional scales. Increasingly, governments from the global south looked to corporations for economic opportunities with the expectation that they will "maintain the framework of the society in which they operate" (Pillay, 2015, p.116).

Interestingly, the trend in resource development to include CSR programs has not been regulated by government policy; rather, it was adopted by industry freely and has since become an industry standard. Pillay describes this "self-regulation model" as a:

> "neoliberal market-based model of economic and social development, with its emphasis on freedom of movement for capital and limited state intervention in and regulation of economic affairs, self-regulatory CSR promotes not the legal regulation of corporations by the state but self-regulation by corporations themselves." (Pillay, 2015, p140) … "Such is the nature of contemporary self-regulatory CSR, that not only is it politically palatable but it is also appealing to policy-makers, NGOs and companies alike. It is comfortably consistent with the neoliberal view of corporate governance with its focus on the shareholder-oriented conception of the corporation" (Pillay, 2015, p.141).

12 Bourgainville Copper Limited (a subsidiary of Rio Tinto Alcan) management chose to ignore nearby Tribal community concerns regarding their local economic security and serious environmental degradation mine… …activities. This oversight caused violent conflict between local revolutionary forces and the mine, and eventual closure, costing lives and assets (Botta, 2014).

There is great deal of debate around CSR, questioning the motivation of the movement and its long-term effects on society. Some economists believe the nature of CSR conflicts with the rational free market economy by interfering with the competitive nature of the market, which is grounded in supply, demand and technological advancement (Karnani, 2010). Aneel Karnani[13] argues that in its natural state, the market in a capitalist system should seek out the most efficient route to deliver goods and services, not take on extra costs such as social welfare (Karnani, 2010). He criticizes CSR, stating that it is not the responsibility of companies to take care of public interest for the sake of making profits; governments should have accountability for welfare (Karnani, 2010). When corporations take on these duties, it allows government and community organizations to limit their involvement in social issues, in turn inhibiting the growth of local and state capacity (Karnani, 2010).

On the other hand, as mentioned earlier, companies have found that there are economic benefits to promoting social and environmental programs that improve the local economic climate in which they operate. In the global arena, where transnational corporations have the assets and power to collaborate with states and NGOs to foster economic development in impoverished regions, there exists the potential for mutual benefit. Furthermore, the above opposition to CSR does not take into account state corruption, which inhibits equitable regulation and policy measures for many nations. Pillay discusses the capacity of cross-sector partnerships to help communities in a number of ways:

> "companies improve the motivation, retention and development of employees; support strategic market positioning and market entry; increase operational efficiency and quality; promote better risk management and access to financing; encourage innovation and new ways of thinking; ensure compliance with changing regulatory requirements and evolving stakeholder expectations; and enable a more stable society and healthy economy" (2003, p.31 & 2015).

In the increasingly competitive global market, many resource industries are beginning to feel the strain of boom and bust commodity prices with increased operation costs. Additionally,

13 Aneel Karnani is an American Business Professor published his opinions of CSR in the August 2010 Wall Street Journal (Karnani, 2010) Move to bibliography

communities have gained the power, through government support and the 'social licenses to operate,' to effectively stall or prevent operations which threaten their livelihoods. Unfortunately, community expectation of CSR deliverables are not always manageable, depending on company means[14] (Smith, 2013).

Community Engagement and CSR

Introduction

Companies that use CSR projects that benefit the lives of people affected by operation are ultimately serving their own self-interest by procuring a stable and supportive population from which to draw employees and services. Paternalistic CSR models see companies acting in lieu of government in their host communities, providing social services and managing public infrastructure. When a company provides the bulk of jobs, as is the case in 'mining towns,' paternalistic models can become precarious during closure. As the mine disassembles and management leaves, communities are left to deal with serious economic losses and an inability to manage public infrastructure and services. For these reasons, companies have been gradually moving away from paternalistic CSR towards Community Engagement CSR, where communities are treated as partners in development strategies, and the social well-being of affected people is considered alongside the material.

Moving away from Paternalistic models of CSR

In developing countries, multinational corporations play a strong role in the socio-economic development goals of the regions where they operate. CSR is sometimes criticized, the argument being that government should be held accountable for such endeavors. In some African nations, including Zimbabwe, South Africa and the DRC, new innovative government legislation has been implemented to collect a percentage of company funds allocated to CSR in order to federally manage regional development projects (Smith, 2013; Mària & Devuyst, 2011). While this legislation/ initiative promotes increased state control in development strategies, it prevents companies from providing the level of support historically promoted within CSR packages. In the work of Mària and Devuyst, the pair discuss the challenges a mining company must

14 The topic of CSR expectations and company size is further discussed in *"When It Comes to CSR, Size Matters"* (Smith, 2013).

overcome in implementing Community Engagement CSR initiatives in the DRC, where paternalistic CSR has historically been the custom in their article *CSR and development: A mining company in Africa* (2011).

Case Study: Challenges in Overcoming Paternalistic CSR in the DRC

The SGM American Mining Company (SGM) produces industrial copper and cobalt in the province of Katanga, where the mining potential has been estimated at forty to a hundred years (Mària & Devuyst, 2011). Due to the longevity of the mine's prospects, it is imperative that the region remain stable and the local people support the project. At the time of the case study in 2011, the mine employed 2500 people, with an additional 1500 subcontractors (Mària & Devuyst, 2011). Besides providing local employment and training opportunities, the company oversaw the implementation of public infrastructure, schools, medical centers, electricity and a communication network. Furthermore, SGM adhered to a strict environmental policy to protect local water sources.

From the total revenues acquired from the SGM mine operation, 0.3% is allocated to community development, healthcare and education projects. From this total, 30% is owed to the Congolese state for their legal contract, and the final 70% is dedicated to SGM organized social ventures. The central government allocates 25% of these funds to the provincial government and only 15% to the local municipal government (Mària & Devuyst, 2011). Table 2 illustrates the flow of funds from the mine to socio-economic development projects for locals and the region. The 30% loss of funds for CSR projects has a dire effect on the amount SGM can provide for the local community. Much of the capital used for SGM social welfare goes towards relocation of villages affected by the mine, regional health care and education (Mària & Devuyst, 2011). However, the government funded projects have not been directed towards the local community, and many local people have complained that they do not feel supported directly by the mine (Mària & Devuyst, 2011). For these reasons, SGM has been working to create a board of directors, including government and NGO officials to manage the funds meant to benefit the community (Mària & Devuyst, 2011).

The following figure outlines the allocation of funds for CSR endeavours from SGM mining revenue. Information for this flow chart was taken directly from the article *CSR and development: A mining company in Africa* (Mària & Devuyst, 2011).

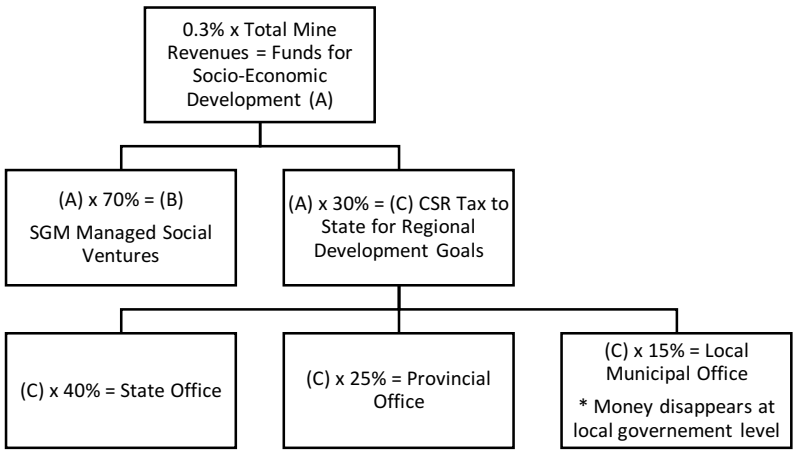


Figure 12: Allocation of CSR funding towards socio-economic development in DRC

Exploration and development costs are high in the DRC, and to remain competitive, SGM has used progressive mining techniques and improved transportation networks to reduce costs (Mària & Devuyst, 2011). These endeavours are not sufficient and the management of community development projects will have to be shared with local government, NGOs and community members. In the DRC, the era of paternalistic mine management is under threat from the shifting global market and state control. This however, does not need to be a negative paradigm shift; providing local people with the tools to build their own capacity could have longer lasting benefits to the socio-economic development of the region where operations occur.

Training local people for employment at the mine improves the local economy. While 97% of the workforce is Congolese, SGM has found it challenging to promote locals into management positions. This is partly due to the industry culture which requires those in senior roles to have a breadth of experience from working at multiple mines, and local people not wanting to move away from their families. To overcome this challenge, an international training program has been initiated to provide Congolese engineers the opportunity to train abroad with the expectation of promotion upon return (Mària & Devuyst, 2011).

A number of critical health issues were identified in the region, including HIV/AIDS, cholera and malaria. To treat and reduce the spread of these illnesses SGM invested in the construction of hospitals and treatment clinics, and distributed medicine and initiated preventative measure programs (Mària & Devuyst, 2011). To promote their capacity to manage and mitigate population health problems, locals were taught about risk factors and preventive techniques for HIV and cholera. The clean water initiative identified sources of contamination for drinking water, such as septic fields, and worked to alleviate the hazards (Mària & Devuyst, 2011). These minor steps essentially eradicated cholera in the region. Malaria was reduced through the use of pesticides and the distribution of mosquito nets (Mària & Devuyst, 2011). Maintaining good public health records will require ongoing program maintenance managed by local health experts.

Improving education was a primary goal for regional development and a primary school was erected in each village. One central secondary school was established with a school bus delivery program to prevent children from sharing the road with mining trucks (Mària & Devuyst, 2011). The operating costs of these schools were meant to be shared by the community, though unfortunately parents were bothered by the $3 a month fee for teachers and supplies, stating that they felt it was the obligation of the mining company to cover these costs (Mària & Devuyst, 2011).

Similar debates about management and economic support for all the social programs continue to cause conflict between the community and SGM. Sharing the responsibility of social welfare with the state further caused disorder, as the Congolese public administration is not only unsupportive, but actively works to extract further finances from the mine with excessive fines[15] and staff arrests.[16] Despite the onslaught of challenges, SGM is committed to working with the local government, community leaders and NGOs to maintain these social programs and public infrastructure through regional capacity building and partnerships. The goal is "to promote a new

15 Public administrators do not have salaries, they need to use fines to supplement their wages (Mària & Devuyst, 2011).
16 The incarceration of mine management for infringement of bylaws cost the company $16 million dollars by 2011 (Mària & Devuyst, 2011).

culture of citizenship against paternalistic tradition inherited from past historic situations for modern and sustainable development in Katanga" (Mària & Devuyst, 2011, p.962).

Corporate Community Consultation

Resource development industries have been criticized for allegedly using CSR to legitimize their activities and influence in rural communities (Mayes, McDonald & Pini, 2014). Additionally, CSR projects without proper community consultation have shown poor longevity and do not reflect community needs. For these reasons community engagement strategies are increasingly used to reflect the community voice. The use of 'corporate community engagement' has, however, sometimes been thought of as a method by which a corporation can manipulate the notion of community benefits (Mayes et al., 2014).

The term 'community' is influential, and is used extensively in sustainable local development discourse (Mayes et al., 2014). Community engagement strategies follow criteria set forth by those interested in obtaining local knowledge and expertise concerning directed development initiatives, and thus the results can be skewed by the methods by which they are administered (Mayes et al., 2014). Identifying communities as places with borders and elected people within communities as local representatives can misconstrue the complex nature of a community (Mayes et al., 2014).

As discussed previously, corporations have adopted self-regulated CSR initiatives that include investment in public infrastructure, social welfare programs and economic development strategies for areas affected by their operations. Identifying 'affected' areas ties into the construction of 'local community' and can cause issues for residents and the intricate network of community relations within the region (Mayes et al., 2014). Mayes, McDonald, & Pini discuss the concept of 'community' in a geographic context, where the 'community' is often identified as a place rather than an on-going "complex social and political process" (Mayes et al., 2014, p.400). The evolving process reaches beyond the barriers of a physical town and is linked to history, culture, neighbouring communities and the outstretched environment. When a corporation decides which places are within their jurisdiction for CSR and community

engagement it selectively includes and excludes systems within the 'local community', which may have long lasting political and physical effects (Mayes et al., 2014).

Corporate community consultation is recognized as a collaborative effort between industry and community to form local opinions about economic, social and environmental policies. In some cases, a board of community members is elected to represent community needs; however, the selection process for these community leaders may improperly characterize the community[17] (Mayes et al., 2014). Furthermore, the method by which local knowledge is collected and sorted is subjective and vulnerable to influence (Mayes et al., 2014).

Case Study: Improper Use of Community Engagement by BHP in Australia

This case study exemplifies the issue of using community engagement to shape community development projects that support corporate incentives rather than reflect community needs. The case outlined in *'Our' community: Corporate social responsibility, neoliberalisation, and mining industry community engagement in rural Australia* (Mayes et al., 2014), examines the strategy used by BHP Billiton (BHP) in the rural Shire of Ravensthorpe, in Southwestern Australia, for the development of a nickel mine with an estimated 32-year life span. Rather than rely on expensive fly-in-fly-out (FIFO) employment, BHP opted to attract existing and new employees for relocation into the region with financial incentives and attractive community development projects. BHP had an advantage when approaching the surrounding communities with the proposal due to economic downturn in the agricultural industry. Furthermore, "in Australia, rural communities are exhorted by government policies, agencies, and development experts to be actively entrepreneurial in order to grasp development opportunities" (Mayes et al., 2014, p.398). The immigration of 650[18] staff and their related families was described as a huge economic opportunity for the region (Mayes et al., 2014).

The towns closest to the mine were selected for residential housing, amenities and services necessary to accommodate the growing population (Mayes et al., 2014). The CSR initiatives thus focused on community development strategies that would ultimately sustain BHP employees'

17 For instance, women, children, elderly and minorities are often exempt from decision making power within communities (Mayes et al., 2014).
18 Doubling the pre-mine population (Mayes et, al., 2014).

amenities and services (Mayes et al., 2014). To gauge the thoughts and opinions of the regional community, a selection of people in elite government positions and business leadership groups was elected to represent the community voice (Mayes et al., 2014). Additionally, a household survey was conducted to ascertain retail, medical, sport, banking, transportation and education shortfalls as well as judgments of the local government's ability to provide public infrastructure and regional development strategies (Mayes et al., 2014). The survey used a ranking system for specific questions, rather than obtaining local opinions (Mayes et al., 2014). This engagement strategy excluded the thoughts and opinions of many community groups, as the community representatives were business oriented and the survey limited the discussion of community needs to the BHP's design of community development.

This 'local knowledge' was then used to corroborate the regional development strategy, which focused on the mine's central role in bringing prosperity to the region and providing state services (Mayes et al., 2014). The CSR initiatives included upgrades to roads necessary for mine activity, construction of an airport and a new elementary school,[19] and the development of a Community Investment Plan (CIP) (Mayes et al., 2014). The CIP supported businesses that would service the growing population and funds were linked to the revenues from the mine (Mayes et al., 2014). The economic development strategy did not include a mine closure plan, and when nickel prices plummeted in 2009 the mine shut down after only a year of operation, leaving local residents tied into the CIP economically devastated (Mayes et al., 2014).

Closing Comments

Investing in community development projects and education programs that improve livelihoods are necessary steps towards stabilizing a region; however, further steps must be taken to empower communities to manage these systems of stability. Finite resource extraction is an unsustainable economic source, and moving away from paternalistic measures of support help communities plan and mitigate the eventual loss of income. Social welfare programs must be held accountable to local government and community leaders, ensuring there is capacity to manage eventual outcomes.

19 Many locals felt that funds would have been better allocated to upgrading the existing school, which was more central (Mayes et al., 2014).

While it has been shown that community engagement is a crucial step when planning any socio-economic development strategy from a CSR perspective, it is imperative that the methods in which it is executed be transparent and truly reflect the community voice. Under the umbrella of social welfare, a company can manipulate the process of acquiring 'local knowledge' to benefit company goals rather than build trust and local capacity. It is also important to note the geographic and subjective nature of community engagement strategies and to respect the social, economic and cultural networks that tie a given community to outlying populations and ecosystems.

Many resource development projects include education and training for local people to work at the mine site or develop businesses to support growing service demands. Investing in education has proven to have long lasting benefits for communities, during and after mine closure. In the next section, investing in education and industry job training will be discussed.

Education and Employment in Industry

Introduction

Resource development is often described as an economic opportunity for local communities; however, the necessary skills must be developed within a population to participate in the resource benefits. For this reason, education and training programs are organized by industry, local education institution and government. Investing in education has further benefits local communities, as it builds capacity and flexibility.

Resource industries face challenges in acquiring skilled labour, as competition for trades specialists, engineers and scientists is growing due to labour shortage associated with the Baby Boomer retirement and lowered birth rates in western countries. Mitigating these short falls and attracting professionals to the industry is a challenge that must be overcome.

In this section, the relevance of education and economic growth will be discussed, followed by strategies to improve labour outlook for resource industries.

Education and Economic Development

There have been numerous studies on the benefits of education to society, primarily examining how education quantity and quality affects the Gross Domestic Production (GDP) of nations (Barro, 2001; Hanushek & Kimko, 2000). 'Education quantity' refers to the amount of years achieved from primary, to secondary and post-secondary education stages, expressed using the term "Schooling flow variable" (Hanushek & Kimko, 2000, p.1184). 'Education quality' refers to the level of cognitive ability attained from education, often evaluated through testing of student abilities in reading, writing, math and science (Barro, 2001). It is undeniable that both quantity and quality have a positive correlation with growth; however, it has been argued that quality significantly improves 'Labour-force quality,' which has a stronger effect on growth rates" (Hanushek & Kimko, 2000, p.1185) than does quantity. This is due to the importance of engineering and science for innovation, technology, research and development.

Measuring labour-force quality can be done by examining levels of education resources, and testing the cognitive skills of students. Hanushek and Kimko used extensive international census data to examine education and nation growth trends. They used test scores from the International Association for the Evaluation of Educational Achievement (based on American curriculum) and International Assessment of Educational Progress (not based on any curriculum) in 39 countries over the span of 30 years (Hanushek & Kimko, 2000).

There is a general understanding that investing in education resources, such as teachers, supplies and infrastructure, will generate more human capital[20] by providing more quantity and quality of education to students. Analysis of these effects has shown that this correlation is hindered by a variety of external factors unique to each region and that investment in education resources has surprisingly low results for improving quantity and quality in a global context (Hanushek & Kimko, 2000). The economic disparity among nations has a strong influence on how investment in education resources will affect the quantity and quality of education acquired by local students. For instance, a nation with an existing high ratio of human capital typically has a populous with a higher degree of expendable income and more capable of procuring the benefits of increased education resources, compared to an impoverished nation where children have less

20 Stock of knowledge.

access to schools. Furthermore, certain education resources proved to have varying effects on student productivity in different cultures. Incidentally, larger elementary class sizes have a negative impact on student productivity in North America, though they have little or no effect in Asia (Hanushek & Kimko, 2000).

The two studies by Barro and Hanushek & Kimko had a few overlapping conclusions. Investing in education resources to improve quantity and quality of education had varying effects, due to external social and environmental factors in different countries. There is a strong correlation between quality education and higher 'labour-force-quality' and thus economic growth. Additionally, increased quantity of education in the global south had a negative effect on birthrates, as a more educated female population reduced family sizes, in turn accumulating more human capital in the whole population (Barro, 2001; Hanushek & Kimko, 2000). It is important to examine education as a continuous process, adapting over time to evolving technologies, societies, resources and environments (Hanushek & Kimko, 2000).

Resource Industry Job Training

The resource industry is reliant on skilled labour through the stages of exploration, development of the resource, operations and closure, and at all stages administration and management. Acquiring the appropriate staff for onsite employment can be difficult, as these positions often require higher education, such as engineering or certification for trades work. Human resource departments are faced with a number of challenges in filling these necessary skilled labour roles: the looming baby boomer retirement which will leave a deficit in upper level experienced management, the entry of inexperienced young talent to the resource industry, and the deficit in trades people (Parkinson, Mcfarland & Mckenna, 2015).

The baby boomer crisis[21] has been estimated to peak in 2030, with the retirement of 25% of the population (Parkinson et al., 2015). Many western countries, including Canada, have experienced a reduced annual birthrate and thus labour pool. The birthrate has fallen from 4% growth in the 1970s to an estimated 1.6% in current times, and will be further reduced to 0.5% by 2020

21 A term used to describe the looming retirement of the baby boomer generation and the effects on the economy and labour market (Parkinson et al., 2015).

(Parkinson, et. al. 2015). This situation will have serious consequences for stable economic growth without reliance on immigration (Parkinson, et. al. 2015).

For the resource industry, there exists a knowledge gap between lower level employees and higher management positions, which will need to be filled (Ednie, 2004). Furthermore, those with expertise must evolve with new technologies, and even people with experience can fail to keep up without training (Ednie, 2004).

Foreseeing this situation, many companies have incorporated leadership and mentorship programs to help train staff towards taking more responsibility and accountability for company actions moving forward (Ednie, 2004). Providing onsite training and education programs helps expand skills within the company without the typical leave of absence to attend school (Ednie, 2004). Another means of enhancing employee skills is through international placement, where individuals procure breadth of experience while working at a number of international locations. This provides a crash course in overcoming unexpected challenges such as cultural differences, adapting to new environments, and learning from different expert teams. The drawback to this method is the relocation of employees and their families (Ednie, 2004).

Capable graduates bring fresh insight into a work environment, but as the labour pool declines over time, attracting engineers and scientist to the resource industry may become more problematic. Extractive industries commonly operate in remote and possibly unappealing locations. Overcoming this challenge depends on the presentation of positive benefits and opportunities (Ednie, 2004). Syncrude Canada Ltd., an oil and gas company offers graduate students coop job placements, to get a feel for the climate, work opportunities, and social environment in Fort McMurray, Alberta. Of the total 180 student annual job placements, 10-12% become permanent employees (Ednie, 2004).

Research has shown that youth have become less interested in pursuing trades, resulting in a sizeable shortfall for industry needs (Ednie, 2004). Enticing youth into trades programs has been a collected effort between government, education institutions, communities and industries. In western Canada a number of programs exist to teach students about the career opportunities

associated with trades, such a *Careers: The Next Generation*. [22] The *Industry Training Authority* (2016) in British Columbia overseas trades shortages and manages the distribution of resources and certified professionals to a variety of fields.

Many resource development projects in remote locations benefit from training and hiring local populations. In Canada, this includes negotiations with First Nation communities through Impact Benefit Agreements (IBA), and with provincial governments through Socio-Economic Agreements (SEA). This involves supporting education and training endeavors in partnership with education institutions and government funding. Studies have shown that First Nations individuals have difficulty deciding which career path is best suited to their talents, and therefore are hesitant to invest time and energy in specific education avenues (Ednie, 2004). A number of Northern post-secondary schools now offer introductions to trades programs, where students can learn a variety of skills in up to five trades (Ednie, 2004). Having student job placements for graduates is another incentive to enroll in school.

Closing Comments

An overwhelming amount of data points to the importance of education from primary to post-secondary levels. Ensuring that the proper education resources are available to support a seamless 'school-flow-variable' and that a marked effort to improve the quality of education is in place to promote 'labour-force-quality' will have a positive effect on economic growth.

In the resource industry, attracting and retaining skilled labour is a challenge that will continue to grow as the labour pool in western countries diminishes. One strategy is to focus on training and hiring local populations near remote operations, many of whom are First Nations. The problem with this strategy is that providing education and training opportunities is not always sufficient in drawing and retaining indigenous employment. As was explained in the studies performed by Robert Barro and Eric Hanushek & Dennis Kimko, improving education resources does not always have a strong correlation with improved quality and quantity of education for a population when external variables such as poverty are present. In the next section, common

22 An Alberta based non-profit society (http://www.nextgen.org/).

challenges experienced by indigenous people will be discussed, along with their implications for employment in the resource industry.

Indigenous Employment and Resource Development Projects

Introduction

According to the *Mining and Indigenous Peoples Issues Review,* prepared for the International Council on Mining and Metals, the vulnerability of indigenous people globally has been increasing (Render, 2004). Years of oppression have left many of these communities disadvantaged with poverty, lack of education and healthcare compared to their recently settled counterparts. The obstacles faced when attempting to improve the socio-economic status of indigenous communities are tied to the struggles they face in overcoming the effects of colonization and social injustice. Many governments fail to properly integrate indigenous customs and decision-making power into policies which directly affect their livelihoods and well-being, further relegating these people to the status of subclass citizens (Render, 2004). Empowering indigenous people to regain their self-determination and autonomy will be the first step in creating equality between indigenous and non-indigenous populations (Render, 2004).

Disadvantaged Populations

The most fragile communities are geographically remote, removed from urban centers. They are shielded from outside influence, but lack necessary social services. In Canada, the First Nations people have had to deal with the legacies of abuse brought on by the Residential School system, and other countries have their own dark histories involving the unjust treatment of their indigenous populations.[23] The loss of culture, physical and sexual abuse[24] has torn many communities apart, where coping mechanism result in violence, alcohol and substance abuse (Buell, 2006; Render, 2004).

The repercussion of traditional land being lost to colonization and the simultaneous loss of cultural identity do to discrimination has been a diminished interest in cultural activities, such as hunting, fishing, foraging and ceremonies. Obtaining traditional food sources is an excellent

23 A case study in Australia will be further discuss this topic later on in the section.
24 "75-90 % of women in northern Aboriginal communities have been abused" (Buell, 2006, p.22).

source of nutrition and the activity itself a foundation of cultural pride. The fairly new transition from traditional food to store-bought processed carbohydrates, fats and sugars, is very unhealthy for indigenous metabolisms (Buell, 2006). A considerable amount of medical research has linked the high instances of "diabetes, cancer, heart disease, obesity and dental cavities, decreased fitness levels and tolerance for climate" (Buell, 2006, p.13) to a reliance on processed food.

The transition to a wage earning economy is fraught with obstacles, as remote areas have less employment opportunities and higher living costs. Additionally, the scarcity in education avenues results in a labour pool with entry level skills, with shorter contracts and less stability. Unemployment, poverty and high living costs can result in household overcrowding,[25] where dire living conditions have overwhelming negative effects, such as increased transmission of airborne ailments[26] and sexually transmitted diseases,[27] depression, anxiety, poor performance in school or at work, heightened abuse and suicide[28] (Buell, 2006).

Employment Challenges

Resource industries and governments have invested interest in employing indigenous community members residing near proposed RDPs, income from employment can improve the socio-economic environment for communities, which in turn brings stability. Without relying on a FIFOW, the company saves on expensive transportation costs while retaining more human capital over the long run. Concurrently, resource benefits remain in the community for circulation and economic stimulation, rather than being siphoned out by the transient employees. What is more, local employment alleviates social assistance and unemployment compensation while increasing income tax revenues for government use in public works.

A spinoff benefit is a re-established sense of pride which accompanies economic independence, where wage earners feel they can take care of their families and invest in social interests (Haley & Fisher, 2014). Role models have an incredibly positive influence on youth and it has been

25 There is an epidemic of household overcrowding in the Canadian North (Buell, 2006).
26 Inuit children have the highest mortality rate from airborne infections (Buell, 2006).
27 "Gonorrhea has increased 300% in the North West Territories since 1999" (Buell, 2006, p.23).
28 Suicide rates in Northern Canadian Inuit and First Nation communities are ten times higher than the national average (Buell, 2006).

observed that high school graduation increases when job opportunities and their benefits are evident[29] (Haley & Fisher, 2014).

Nevertheless, attracting and retaining local indigenous employees can be problematic, as historical relations with outsiders and resource industries have been predominantly negative, and dominant cultural business practice continues to disregard indigenous value systems (Render, 2004). Many companies have reported the challenge in training and retaining indigenous employees as their irregular work attendance and impartial attitude for advancement results in a high turnover, which is an inefficient and expensive allocation of company resources (Haley & Fisher, 2014; Pearson & Daff, 2010; O'Faircheallaigh, 2006).

Recruitment

Following Impact Benefit Agreement protocol, a company may be required to achieve local employment goals, thus fulfilling the social license to operate and maintaining a good public image. A Socio-economic baseline study will assess a community's capacity and resources, before recruitment begins. Reasons for individuals not meeting initial qualification for recruitment often include education levels, serious health problems, poor employment records and inability to pass a drug test (Haley & Fisher, 2014; Pearson & Daff, 2010). Unfortunate reasons for community members not participating in training recruitment include inadequate information dissemination regarding available job opportunities, racism and stereotyping towards indigenous employees, a failure to connect with women in the community and women not being able to acquire childcare (Haley & Fisher, 2014; Pearson & Daff, 2010).

Training, Upgrading, and Promotions

According to O'Faircheallaigh the benefits to employing indigenous people and how to implement employment and training programs has been thoroughly discussed. The number one challenge is a "lack of skills and work experience needed to compete on the open job market or to advance to more senior positions, and an absence or scarcity of available opportunities to

29 Efforts to promote job opportunities with the aid of role models increased high school graduation rates in Northeaster Indigenous communities in Alaska (Haley & Fisher, 2014)

upgrade existing skills" (O'Faircheallaigh, 2006, p.82). It should be noted that the degree of shortfall within a given community will range.

Many companies offer onsite training for entry-level positions with opportunities to upgrade skills through education funding. Drawbacks to job training include low level literacy and numeracy abilities, poor attendance, disinterest, negative behaviour, and the training schedule interfering with cultural activities. Reasons for individuals being hesitant to pursue higher education are often influenced by lack of self-esteem, fear of leaving home and the understanding of boom and bust cycles.[30] (Haley & Fisher, 2014; Pearson & Daff, 2010).

Retention

Companies experience higher turnover with their indigenous employees over their non-indigenous employees (Pearson & Daff, 2010; Haley and Fisher, 2014). The cause has often been chalked up to a culturally different standard of work ethic, which paints indigenous people as lazy or ill prepared for hard work, when in fact a lack of commitment to these jobs often relates to prioritizing culture practice. Without over-generalizing, many traditional activities include seasonal hunting and gathering and ceremonies which solidify their social identity and ties to the land (Pearson & Daff, 2010). The rigorous scheduling of large-scale RDPs is typically not appropriate for people who wish to take long periods of time off, regularly, for personal reasons. Other notable reasons for turnover are extensive time spent away from family and the work environment being unenjoyable. The fact that indigenous people have been scrutinized in the extractive industry for having poor work ethic is a reaction cultivated by a lack of respect and understanding of their history and cultural values (Pearson & Daff, 2010).

Case Study: Poor Success Rate of an Indigenous Job Training Strategy

A good case study that reflects how a resource extraction company can miss the mark when approaching an indigenous community for employment opportunities is outlined by Pearson and Daff in their article *Education and employment issues for indigenous Australians in remote regions: A case study of a mining company initiative,* where the authors examine the strategy

30 Investing time and energy into one field of study, with the knowledge the industry and connected job opportunities are not stable.

used to attract and train local indigenous people for employment opportunities. Rio Tinto Alcan (RTA) intended to improve the socio-economic status of the Yolngu communities near their operation at Nhulunbuy, in Northern Australia, with a work-readiness and job placement program. The program had a poor success rate and revealed a lack of capacity within the community caused by a history of discrimination, and more importantly a failure of the government and the company to understand and respect the Yolngu's traditions and "labour market concerns" (Pearson & Daff, 2010, p.21).

The Yolngu tribes have resided along the Arnhem coast for approximately 55000 years, hunting, gathering and trading with sea fairing tribes from what are now the Indonesian islands. Colonization and the trials and tribulations associated with a western capitalist economy are thus a new problem when set against the rich history in the region. In the 1930s, the Australian government used tactics to assimilate Aboriginals into their society, by limiting their mobility and outlawing traditional practice, including trade.[31] Essentially, these actions created an environment where the people became dependent on low-wage work or state support.[32] During this time the people became an asset to the pastoral industry, and eventually progressed to owning and operating their own pastoral farms.

During the 1960s, a surge in Aboriginal rights acquisition resulted in the "commonwealth removing constitutional barriers to indigenous policy," most notably, "removing restrictions to movement, and voting rights" (Pearson & Daff, 2010, p.24). This adjustment encouraged Aboriginal self-determination allowing many people to return to the hinterland, and once again take up traditional and spiritual activities. This is not to say that many people have not been stripped of "their pride and identity" (Pearson & Daff, 2010, p.22), an overwhelming amount of the population continues to struggle with poverty, education, health problems and discrimination (Pearson & Daff, 2010).

The pastoral industry, a staple business in the region, has evolved and mechanized and no longer offers the same degree of employment to locals (Pearson & Daff, 2010). Furthermore, the

31 In the early twentieth century the Australian government blocked traditional trade between the Yonglu and Macassan seafaring tribes of Indonesia (Pearson & Daff, 2010).
32 Not unlike the tactics used by the Canadian government with First Nations.

Aboriginal population in Northern Australia has amassed to a level that cannot be sustained by available work[33] (Pearson & Daff, 2010). The government has looked to large-scale mining as a solution to the employment crisis, hoping to alleviate costly welfare dependence and stimulate economic development (Pearson & Daff, 2010). An urban center for economic activity was built in traditional Yolngu territory, for the purpose of supporting expanding industry and servicing the onslaught of mining employees (Pearson & Daff, 2010). Once again, the Yolngu people felt that they are being forced to assimilate and support an industry that does not reflect their cultural needs.

It was deduced that Yolngu could be recruited based on basic criteria, and rudimentary to high level skills taught to individuals through a job readiness program named ALERT. Upon in-depth training and relationship building, people would be referred for employment in the service industry for the new town of 4000 residents, or at the mine. The main elements of the ALERT program are depicted below in figure 13, a visual interpretation of the job-training strategy provided by Pearson and Daff (Pearson & Daff, 2010, p.29)

33 Including traditional activities, such as hunting and foraging.

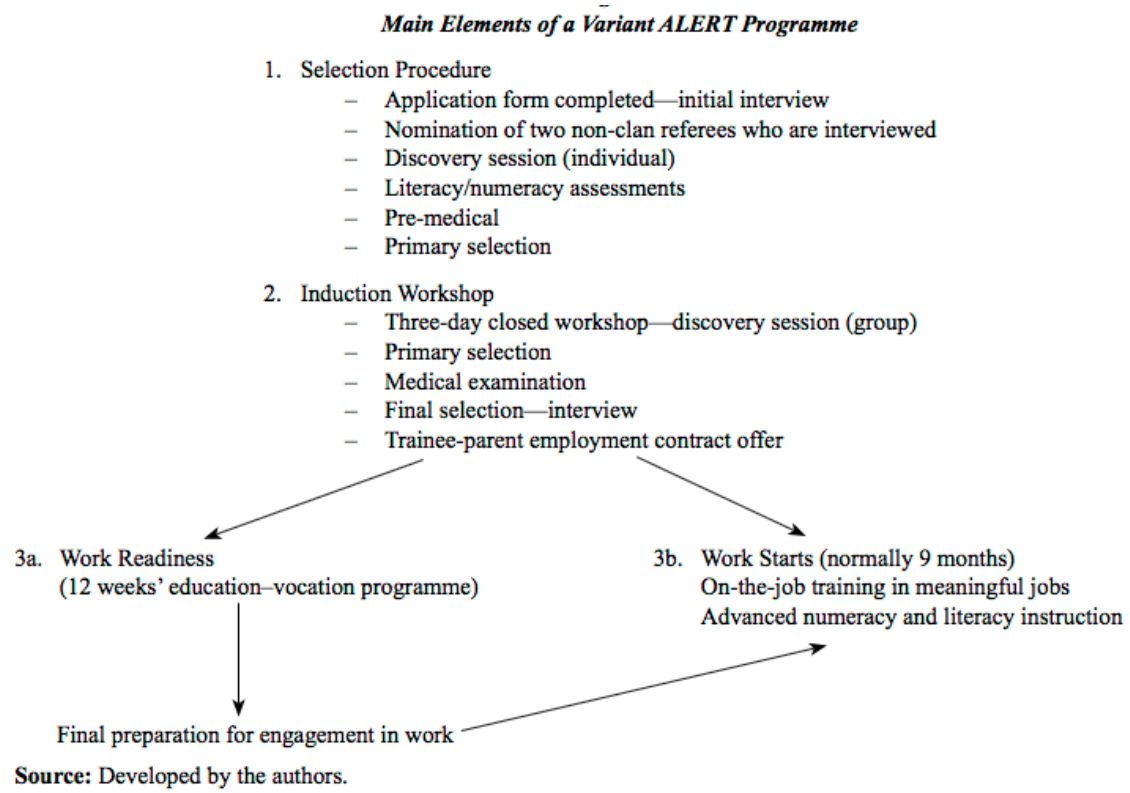


Figure 13: Main Elements of the ALERT Job Training Program

The Yolngu inhabit three territories, the Nhulunbuy, Arnhem and Arafura, with a total estimated population around 12000.[34] ALERT focused their recruitment in the Nhulunbuy region, closest to operations. Of the 4700 people living in Nhulunbuy, recruitment only drew 58 applicants, of whom 50% did not pass the initial selection stage predominantly due to being medically unfit, having poor attitude or absence from the interview. Of the remaining 29 individuals, literacy and numeracy skills were assessed[35] to decipher whether they would enter into the *Work Readiness: education-vocation* program to upgrade basic skills or the *Work Starts: On-the-job training,* including advanced numeracy and literacy instruction. Of the 29 participants that passed recruitment, only 10 completed the program and pursued employment, 7 in the town, and 3 at Rio Tinto Alcan. 44% of people who entered into either program left for personal reasons or were let go for poor attendance or behaviour (Pearson & Daff, 2010).

34 Population statistics extracted from Wikipedia site https://en.wikipedia.org/wiki/Arnhem_Land
35 The literacy of 62% of the applicants was at a grade 1-2 level.

When examining the success rate of these programs against the regional population size, the failure to attract and retain the interest of the Aboriginal people was eye-opening. At the recruitment stage, strict basic requirements were in place due to the expectancy that individuals would be working at a dangerous mine site, when most interviewees expressed a distinct lack of interest in working for RTA (Pearson & Daff, 2010). The Incredibly low levels of literacy and numeracy made certain training programs difficult to carry out, especially when managing the disheartening notion that individuals felt at not being adequately educated (Pearson & Daff, 2010). These issues combined with the conflicting program and employment schedule with cultural practice and personal priorities, so the drop-out and dismissal rate was high (Pearson & Daff, 2010).

Not surprisingly, the staff at RTA running ALERT were frustrated at the locals' lack of interest in the training programs and procuring 'meaningful' work, and believed the outcome was in part due to an inability of the Yolngu to "possess contemporary economic concepts of doing business" (Pearson & Daff, 2010, p.22). It is important to distinguish between an ability and a choice in this regard, as it is a common practice to define oneself by their work, and the Yolngu see their work in the environment and the religious ceremonies which tie them to the land. The Yolngu have made it clear throughout recent history that their cultural activities and lifestyle have priority over western activities including wage-employment. Those individuals who chose mainstream employment over cultural activities were recorded in the study to have been shunned by elders and community leaders (Pearson & Daff, 2010).

The leader of Gumatji clan, Gallarwuy Yunupingu speaks to this concern:

> "The clans of the East Arnhem Land join me in acknowledging no king, no church and no state. Our allegiance is to each other, to our land to the ceremonies that define us. It is through the ceremonies that our lives are created. These ceremonies record and pass on our laws that give us ownership of the land and of the seas, and the rules by which we live." (Yunupingu 2009: 34; Pearson & Daff, 2010, p. 32)"

Unfortunately, the land cannot fully sustain the growing population and dependence on the state for welfare is a poor solution. Retaining a rich culture while improving community health and well-being will be dependent on finding a balance that both services modern Australia and protects Aboriginal rights. The most disturbing results from Pearson and Daff's study was the high instance of medical ailments and low levels of education, both long-term effects of discrimination and unequal allocation of crucial services and resources. There is an increased need for "understanding the of role education as a significant factor in labour market disadvantage, poorer employment prospects, higher states of poverty as well as poor health and housing and dependency on welfare" (Pearson & Daff, 2010, p.31).

Socio-Economic Risk-Benefit Analysis of Resource Development

Resource development projects offer economic opportunities, but at what cost? The loss of traditional land, environmental impacts, employment taking time away from cultural activities and the potential negative social impacts associated with large-scale RDPs are concerns indigenous communities face when approached by developers (Haley & Fisher, 2014; Pearson & Daff, 2010; O'Faircheallaigh, 2006; Brundtland, 1987). In this section, risk-benefit analysis for RDP as means of improving socio-economic development for remote indigenous communities will be discussed using the case study outlined in Mark Buell's article *Resource Extraction Development and Well-Being in the North* (Buell, 2006).

The Canadian Artic is rich in natural resources, such as minerals and fossil fuels,[36] though lack of human settlement, amenities and transportation corridors has limited extraction (Buell, 2006). In 1974, the Government of Canada commissioned an investigation with head Justice Thomas Berger to evaluate the socio-economic impacts of developing oil and gas in the Yukon and Northwest Territories (NWT) (Brundtland, 1987). The report concluded in 1977 that a moratorium on oil and gas development was necessary "in order for aboriginal people to fully participate in the development of the fossil fuel reserves in the NWT, time was needed to settle land claims and build aboriginal capacity to participate in and benefit from the development" (Brundtland, 1987, p.29).

36 Estimate 1 trillion dollars of natural gas in Nunavut alone (Buell, 2006)

Northern indigenous populations in Canada are confronted with a difficult dilemma - the natural environment which once governed their lives is no longer the cornerstone of their survival. Modern medicine, food sources, goods and services have reduced their reliance on traditional hunting and foraging (Buell, 2006). This has allowed populations to grow beyond the scope of what the environment could have naturally supported. Additionally, human settlement and resource extraction continuously encroach on the natural habitat of game animals (Buell, 2006). Western society has been woven into their lives, and Northern communities are now a part of the "modern consumer culture" (Buell, 2006, p.2). This is not to say that cultural practice and traditional livelihoods are not a critical component in their lives, as will be discussed shortly.

In Canada, indigenous people are notoriously less advantaged than their neighbours, having lower education levels and an estimated 50% less average wage (Buell, 2006). This disparity between indigenous and non-indigenous is acutely present in Northern Canada, where the social environment has been described as "two norths," both surviving off the same resources (Buell, 2006, p.17). The better educated receive the stable lucrative jobs, and the disadvantaged struggle to prosper in an increasingly expensive place to live. This visible hierarchy further entrenches the notion that whites are better than First Nations people, resulting in low self-esteem and destructive behaviour (Buell, 2006).

The benefits associated with resource development in the North are, in theory, great, bringing much needed direct employment and spinoff industries[37] while improving access to healthcare and education. The potential for this socio-economic development must, however, be managed to mitigate the inherent risks - influx of temporary workforce, the resource curse, the disruption of traditional livelihoods, and psychological stress.

FIFOW

Large-scale projects require temporary fly-in-fly-out workforce (FIFOW) if the local populace cannot sufficiently supply needed workers. The negative externalities associated with a FIFOW are discussed at length throughout this paper.[38] In addition to concerns related to FIFOW, the

37 The unemployment rate in the NWT is 50% (Buell, 2006)
38 Refer to the introduction chapter and the interview results and analysis chapters for more details.

transient population has the effect of disrupting the equilibrium of a community, potentially fueling harmful behaviour such as substance abuse and prostitution. As intricate community ties break down, human capital is lost and the ability to build such capacity is diminished (Buell, 2006). When a community feels the negative effects of a FIFOW and does not benefit economically from a RDP, the feeling of exploitation fosters anger and resentment (Buell, 2006).

The Nature of the Resource Industry

The boom and bust nature of RDPs are particularly hard on First Nation communities, as the boom cycle interrupts traditional livelihoods, replacing it with an accustomed standard of living. Cultural ties to traditional land prevent community members from emigrating in pursuit of employment following closure, economic downturns and resource depletion, intensifying depression and the feeling of being fractured between a western and traditional world (Rayher, Gillis & Achbar, 2015).

Disruption of Traditional Hunting and Foraging

RDPs disrupt traditional hunting and foraging in a number of ways, of which three will be discussed. First, the RDP footprint can limit access to traditional hunting grounds, making the activity difficult (Buell, 2006). Access to certain family trap-lines may be hindered, while others are not, creating disputes amongst family groups (Buell, 2006). Secondly, environmental degradation and migration route disruption causes stress to ungulates, interfering with natural migration cycles and population health (Buell, 2006). Third, employment schedules prevent individuals from partaking in seasonal hunting trips (Buell, 2006).

Traditional activities are critical to the health and well-being Northern First Nations communities. Besides the known health problems associated with dietary changes, the loss of food security that comes from harvesting “country food” (Buell, 2006, p.13) results in household economic losses. Subsistent harvesting in Northern Canada was estimated in 2001 to be a 40-60-million-dollar industry (Buell, 2006). An individual harvester brings home on average $10000-$11000 in food and furs to support his family (Buell, 2006).

Psychological Stress

Partaking in cultural activities fosters a sense of pride; emotional and spiritual well-being. When traditional lifestyle is lost to notions of development, First Nations communities and individuals lose the tools they need to manage change. This "loss of identify manifests in violence, substance abuse and suicide" (Brundtland, 1987 p.25).

Quality of Life Index

There is an assumption that socio-economic development will improve quality of life through improved "sociability, economic security, political efficacy and personal security" (Buell, 2006, p.4). This assumption should be expanded for Inuit and First Nation communities to include the protection and/or generation of cultural activities for their positive influence on physical and mental health (Buell, 2006). The Nunatsiavut Government now includes harvesting compensation programs in their Inuit Impact Benefit Agreements (IIBAs), which calculate losses in nutritional and economic benefits (Buell, 2006).

Inuit people have voiced their "desire for greater autonomy and self-sufficiency" (Buell, 2006, p.3), which means empowering communities to regain sovereignty and self-determination. A crucial step towards this goal is providing the tools necessary for building capacity, improving education and community healing. The Berger commission was innovative in recognizing the importance of providing the appropriate time necessary for communities to ready themselves for participation in an industry that would greatly affect their lives. All too often the decision-making and planning process is rushed, preventing equal opportunity for rights-holders.

Case Study: Overcoming Indigenous Employment Challenges at Red Dog Mine in Alaska

There have been a number of successful ventures where indigenous employment and retention has been successful, with a positive experience for community members, and where capacity and retention of social fabric has been achieved. This next section will examine the Teck Resources Ltd. Red Dog Mine (RDM) in Alaska to illustrate successful community engagement, employee training and retention.

Teck Resources Ltd owns and operates RDM in Northwest Alaska. Prior to mine planning, Teck approached the NANA Regional Corporation Inc., an organization that represents the cultural and development needs of 11 indigenous villages in the region (Haley & Fisher, 2014). Community members voiced their concerns about how the mine would change aspects of their lives; however, Elders supported the opportunity for employment to reduce poverty and an agreement was made in 1982 which included local hiring goals for NANA members (Haley & Fisher, 2014) and part ownership of the mine.[39] Recruitment, training, education and employment were successful due to a strong partnership between Teck, NANA, local education institutions and government, along with a proactive mentorship program for employees (Haley & Fisher, 2014).

Teck was successful in overcoming common challenges experienced by indigenous people in the resource industry, including education limitations, difficulties during job training, disinterest in upgrading skills and perusing promotions as well high turnover of employees. The innovative solutions to these common challenges have been outlined in Sharman Haley and David Fisher's article *Indigenous Employment, Training and Retention: Success and Challenges at the Red Dog Mine*.

Recruitment

As mentioned earlier, lack of education in rural indigenous communities is a primary barrier for hiring at RDPs, as it was for the NANA communities at Red Dog Mine. To overcome this barrier, Teck partnered with local education institutions to promote the importance of school attendance and high school completion in the communities. This involved school visitations from Teck staff to discuss job opportunities and the necessary academic backgrounds to achieve available employment (Haley & Fisher, 2014).

The importance of family role models and community support networks in childhood development and academic appreciation was brought to the attention of community leaders (Haley & Fisher, 2014). Culturally, it was not customary in the communities to reprimand

39 For more information on the innovative partnership strategy and community development, refer to "We are Stronger Together" information sheet on Teck's website, http://www.teck.com/operations/united-states/operations/red-dog/.

children for skipping school to remain home with the family or attend cultural activities, despite the fact that absence would hinder their academic advancements (Haley & Fisher, 2014). Moreover, a child's attendance in school has been theorized to affect their work ethic as an adult (Haley & Fisher, 2014). Parents have since been encouraged to support their children's interests in school and be strict about attendance (Haley & Fisher, 2014). A strategy which has shown success in some cases (not used at RDM), is providing parents with financial incentives to ensure children are attending school regularly (Haley & Fisher, 2014).

Training, Upgrading, and Promotions

Individuals with entry level skills often have a difficult time with job training despite their abilities.[40] Overcoming this challenge took an understanding of NANA learning styles, and an appreciation for the cultural hands-on method over the western class room style of learning (Haley & Fisher, 2014). Once this obstacle was understood, the self-esteem of trainees and overall training results improved. A leadership-mentor programs has been established with great results, where trainees work under a mentor and eventually take on trainees of their own. Building a community of support rather than a hierarchy of employment (Haley & Fisher, 2014).

For those that completed high school and entry training, it was found that employees from NANA appeared to be uninterested in upgrading their skills for higher positions or pursuing promotions when available (Haley & Fisher, 2014). When this situation was further investigated a number of reasons surfaced, which Teck has since been working to resolve. While Teck offers full scholarships and apprenticeship programs to NANA students and employees for furthering education, community members showed disinterest in leaving their home and families for the length of time necessary to acquire degrees (Haley & Fisher, 2014). Moreover, entry level position salaries at the mine far exceeding any other available job opportunities in the region (Haley & Fisher, 2014). One solution offered at RDM is the 'semester on, semester off ' program, where individuals rotate work and school at 6 month intervals (Haley & Fisher, 2014). Another option under investigation is providing certain courses onsite, to reduce necessary time spent away in school.

40 As was illustrated in the RTA Australian Mine case study.

An issue that surfaced was the cultural practice of NANA members to exercise humility; it is seen as poor taste to boast about one's achievements and good work to others (Haley & Fisher, 2014). This cultural difference from western normative business practice resulted in NANA members' failing to pursue promotions (Haley & Fisher, 2014). Additionally, the prospect of 'bossing around' other members of their community was so disagreeable some would rather not work at the mine at all (Haley & Fisher, 2014). Discussing these issues with NANA employees opened a door for greater understanding between Teck and the community. Cross-cultural training for all levels of staff is mandatory at RDM and any work related grievances are to be discussed in a safe space (Haley & Fisher, 2014).

Teck managers are expected to work at a number of international locations to gain breadth experience, a undertaking involving years abroad (Haley & Fisher, 2014). While this is not desirable to most NANA staff, the leadership-mentor program includes 'relief management,' where skilled staff get to experience managing while orienting new management as it filters in from other locations (Haley & Fisher, 2014).

Retention

One of the main reasons for indigenous employment turnover is work scheduling that conflicts with cultural activities. These activities often extend beyond the allotted vacation and leave days offered to mine staff, which force First Nations employees to leave their jobs. This problem is difficult for mine management to overcome, as it is imperative that operations remain competitive. To overcome this challenge, cultural leave of absence has become an option for employees, given that the employee's position can be filled for the duration of the leave (Haley & Fisher, 2014). A labour pool of employees interested in substitutional/part-time work has been established for such arising situations (Haley & Fisher, 2014). Furthermore, employees in good standing who wish to leave for personal reasons are encouraged to give notice and offer their services to the substitute list. This allows the option for individuals to return to work at the mine, and streamlines the re-hiring process (Haley & Fisher, 2014).

The Red Dog Mine education, training and promotion strategy has proven to have beneficial socio-economic development for the NANA communities. Royalties from the mine, as of

February 2014, totalled 146 million, which was divided between the 11 villages represented in the NANA/Teck IBA (Haley & Fisher, 2014). 93 NANA residents have been successfully integrated into mining operations with a payroll roll of 10.9 million in 2010, not including preferential local subcontracting of local businesses for services and goods (Haley & Fisher, 2014). Additionally, an agreement with local government to invest in the Northwest Artic Bureau in lieu of tax accounted for 6.7 million towards regional development initiatives (Haley & Fisher, 2014). The accumulation of economic and human capital in the community has kicked off a number of additional industries including tourism, construction and transportation (Haley & Fisher, 2014).

> "Red dog mine illustrates that, with strong indigenous control over terms of development, mining can make a major contribution towards the social and economic development of local communities. The strong indigenous control pieces are important because it is the local indigenous people themselves who must consider the inherent tradeoffs and find their own balance between creating new opportunities and preserving traditional ways – a balance that provides for a cultural continuity, self-determination and social-development that is sustainable" (Haley & Fisher, 2014, p.33)

Closing Comments

Colonization and social oppression have caused indigenous communities to struggle in acclimatizing to a wage-based economy, resulting in widespread poverty and disillusionment. The loss of traditional land and cultural discrimination have negative effects on self-identify and self-esteem, socially hindering access to available opportunities. These issues are intensified by a lack of education and support services for upgrading skills for employment.

RDP offer employment and socio-economic development opportunities, such as education and training programs, but at what cost to culture and the natural environment? Understanding the risks and benefits associated with RDP for First Nations can help companies develop programs that protect Aboriginal rights while promoting economic development.

As we learned from the Red Dog Mine example, developing a relationship early on with First Nations communities and consulting them throughout the planning process can be mutually beneficial. Concerns of the First Nations were mitigated, while their expertise and support aided

in the development of successful education and employment programs. At every stage of resource development, a culturally sensitive and inclusive strategy must be implemented.

CHAPTER 4: METHODOLOGY

Introduction

This chapter explains the steps that were taken to answer the research question, *how can geographic analysis and community engagement be used to plan directed CSR education programs, related to preparing a population for employment in a resource extractive industry?* In order to assess community preparedness for labour demands and identify shortfalls in available education opportunities, a baseline study was performed to calculate each community's access to schools, followed by a community engagement strategy to capture 'education quality' in NEBC, and additional information pertaining to local education and employment concerns.

The baseline study was conducted to examine each community's access to primary, secondary and post-secondary schools. Additionally, proximate school capacity was calculated to capture student experience through education stage transitions. This type of analysis was however, inadequate in understanding education gaps as it excludes human experience and values (Wisker, 2008). Community planning has evolved to include local thoughts and opinions as the implantation of projects and programs ultimately effects the lives of locals. This approach to planning is referred to as Community-Based Participation Research (CBPR), and is the basis for which this study was designed to align with. Ultimately, the information from this study would be used as a outline for industry to approach communities for partnership in developing education programs suitable to community needs.

To capture local experience and knowledge regarding education and employment, a community engagement strategy was planned, which included a home stay and a series of interviews and focus groups. The purpose of the home stay was for the researcher to become familiar with the communities in the study, build relationships, and learn about Beaver and Cree culture and touring the territory. The in-depth interviews and focus groups targeted individuals from First Nation Band Councils and School Board representatives from the three districts and government agents were involved in community development. The regional assessment of education access used geographic tools, including spatial analysis of regional communities and education opportunities as well as census data for community demographics. The in-depth interviews were analyzed for trending themes regarding education and labour demands using grounded theory.

The goal of the research is to: 1) delineate current conditions in the North East sector of BC related to expanding employment opportunities in the oil and gas industry; 2) determine gaps in education and training resources that would enable local inhabitants to participate in the expanding employment opportunities; and 3) identify causal conditions as well as action strategies.

Selected Research Methodologies

Theoretical Framework

In order to achieve trustworthy and reliable results, the theoretical approach is through a Geographic Analysis of regional education access coupled with grounded theory used to analyze qualitative data from in-depth interviews and focus groups regarding education and employment opportunities in relation to OAG development in NEBC. The geographic analysis provides baseline information on community demographics and physical access to education opportunities. This information is compared to census data on education attainment and employment participation rates, to highlight communities with more acute education gaps.

Grounded theory fosters the development of a coding protocol of information derived from descriptive situations that are elicited from in-depth interview and allows for a narrative of human experience to be included into the data set for analysis on education gaps in NEBC (The Grounded Theory Institute, 2008). This process draws out the common themes and ideas presented in the interviews which were cross-referenced with information obtained from the geographic analysis of education access and the literature review. This strategy is used to compile an accurate picture of the regional concerns relating to OAG employment opportunities and regional development and education strategies.

The geographic analysis acts as a framework for the themes derived from the interviews, where communities with the least amount of education amenities can be targeted for directed-CSR initiatives and the themes outline bridges to education gaps. This first phase of CBPR would give industry a map of community needs and possible education programs, however further development would require additional community engagement and partnerships.

Methodological Limitations, Delimitations and Entering Assumptions

This section examines the key limitation, delimitations and entering assumptions for this research, looking at how the methodology and research design impacted results and consequently suggestions for further work.

Data Value and Limitations

To ensure the "trustworthiness" and accuracy of the data; four of Creswell's strategies were used. The four strategies are: 1) All the research work and processes will be peer reviewed by Committee Members. 2) The data will be triangulated by multiple sources (Note Takers during interviews, and the literature review). 3) Bias was acknowledged. 4) "Member checking" allowed the Participants to review the findings and acknowledge their trustworthiness (Creswell, 2007).

Methodological Limitations

1. The researcher was a novice: It was the first time the researcher had organized and executed a research study including field work, community engagement and qualitative data analysis using grounded theory.
2. Time and Resources: due to the limitation of research grant funding and schedule, some towns and populations could not be included in the study. These included:
    a. Extremely remote communities which were inaccessible;
    b. Interviewees who were unavailable during visits to the region, and could not be interviewed;
    c. Under the target scope for interviewees, important individuals were missed due to lack of background research on specific institutions and organizations.
3. Engagement Fatigue: First Nation representatives were more difficult to connect with, as Band council members experience engagement fatigue where outsiders wish to interview Band members and Elders to extrapolate information and local knowledge without consideration for the time and effort it takes.

Delimitations

1. Community selection: the study excluded smaller towns, and focused on First Nation communities and the larger urban centers. This was done in order to be time efficient, also it was felt that the representatives from the larger urban centers would adequately represent the region. This assumption is subjective and important information may have been lost.
2. Literature review: subjects excluded from the literature review are; education and curriculum planning and geographic information systems. This was done to save space for other important subjects; however, further work with this research would benefit from more background on these subjects.
3. Instruments for data collection: The recording of the interviews did not include video, as this type of equipment is cumbersome and possibly invasive for interviewees. Using video in the future to film a documentary would be an interesting way to further explore and share findings from this research study.
4. Software that could have been used was GIS. The researcher did not have access to GIS, nor time to investigate this alternative. GIS would streamline the geographic analysis process, and it is highly recommended that it be used in the future.

Entering Assumptions

1. The expansion of OAG using HF is relevant to Northern Communities: the extensive untapped natural gas reserves will continue to draw attention and industry development initiatives.
2. Communities want to partake in OAG employment opportunities: the development of the resource will require large amounts of specialized labour, and it is assumed that northern communities will want to take part in the resource benefits.
3. Improving education will prepare communities for employment opportunities: OAG and HF jobs require specialized trades and engineering degrees, students who are adept at math and science with post-secondary opportunities will be better equipped to work in OAG.

4. First Nation communities are disadvantaged compared to the neighbouring towns: It is assumed because of colonization and oppression that First Nations have more obstacles to overcome in acquiring equal access to education and employment opportunities.
5. There are education gaps: It is assumed that the education institution and community resources are not equipped to adequately prepare northern populations for the employment boom.
6. Interviewees were truthful during interviews.

Ethics and Data Storage

This research study includes the participation of human subjects for interview and therefore had to be approved by the Behavioural Research Ethics Board (BREB) at the University of British Columbia. Prior to application for ethics approval, the *Ethical Conduct for Research Involving Humans Course on Research Ethics* (TCP 2: CORE) was completed on October 7, 2014. The BREB application involved an explanation of the research study and purpose of the interviews. Copies of all the interview documents were shared including consent forms, questionnaires, and letters of contact. The *Certificate of Approval – Minimal Risk*, was received on November 3, 2014 and the reference number is H14-02491.

It is required that all data be secure and stored correctly to protect the identity of participants. The interviews were recorded and transcribed, and consent forms printed for signature and collection. These documents are being stored in a locked safe. To further protect the anonymity of participants, no names have been used in this thesis. This research paper is public and available for download from the UBC CIRCLE website.

Geographic Analysis of Education Access

The *Northeast Regional Skills and Training plan* identified access to education as being a key factor when discussing education gaps in NEBC. 'Accessibility' in this case refers both to proximity to schools and capacity of schools. This section describes the valuation process and calculations used to decipher community access to education opportunities. The results from these calculations demonstrate each community's 'school flow variable,' which were then

compared to census data depicting secondary school graduation, post-secondary degree acquirement and employment participation rates.

School Proximity and Valuation

Distance to schools was calculated using distance traveled to school with a driving time limiting factor of 60 minutes. This was done using 'Google maps,' which takes into account speed limits on different road types when calculating driving time. A drive under 10 minutes was given a value of 100%, a drive under 30 minutes a value of 75%, a drive under 60 minutes a value of 25%, and a drive over 60 minutes was given a value of 0%.

It is important to distinguish between the education stages, as they offer different significance for the purpose of this study. Education was split into 4 stages; primary with grades Kindergarten (K) to grade 4, middle school with grades 5 to 8, high school with grades 9 to 12, and post-secondary including trades programs/apprenticeships, certificates/diplomas and university degrees. Almost all communities host at least one elementary school; however, secondary and post-secondary schools are less widespread due to sparse population distribution and resources. In order to put weight on the later stages, which have a more direct link to employment preparation in the oil and gas industry, increasing values were applied to the stages of education; primary at a value of 25%, middle at a value of 50%, high-school at a value of 75% and post-secondary at a value of 100%.

Post-secondary options within the distance-limiting factor of less than an hour driving time were exclusive to Northern Lights College (NLC). NLC has campuses in Fort St John, Dawson Creek, Chetwynd, and Fort Nelson along with a few other campuses outside the study region. All campuses offer upgrades and University Arts and Sciences courses leading to a University Arts and Sciences Certificate, an Associate of Arts Degree, or further post-secondary studies. However, Only the Dawson Creek and Fort St John Campuses offer specialized trades and industry programs related to OAG employment. For this reason, the colleges offering industrial trades programs are given a 100% value, whereas partial programming was valued at 50%.

To calculate community access to education, proximate schools were calculated against education stages to produce an Accessibility Score (AS). The scores ranged from zero to fifteen and a half; zero having no access to schools and 15 and a half having the most access to schools out of the communities being studied. To view the data and calculations refer to Table 5.

In order to measure the effects of community access to education based on distance and education stages, the AS for each community was compared to their high school completion rates, post-secondary degree or equivalent and employment participation rates from 2006 Census Data.

School Capacity

Another important factor to include when calculating education access is school capacity. The education resources for students, including teachers and supplies is limited by capacity. Furthermore, enrolment restrictions may force a family to seek education opportunities outside of the community.

To calculate capacity at education stages, the total youth population from each community was divided four ways to represent each education stage. Schools at each education stage in proximity to each community were tallied and their student capacities accounted for. The schools and their capacities were then scored based on the driving time limiting factors, explained earlier. Scoring goes as follows: under 1 is under capacity, under 2 is below average capacity, under 3 is average capacity, under 4 is above average capacity, under 5 is high capacity and over 5 is over capacity. These calculations are highlighted in Table 7. This points out gaps in the transition from primary, to middle, to secondary and post-secondary stages for different communities, a term that is called 'school flow variable'[41] and has a serious effect on the academic experience of students, as they undergo obstacles during their 'transition stages.'[42]

41 Refer to section 3.3.2 *Education and Economic Development* for recap on school flow variables.
42 This concept will be discussed further on in the report

Census Data 2006

The Canadian National Census is conducted every five years by Statistics Canada through household surveys that aim to gather information on countrywide demographics. The purpose of the census is to provide statistics for civic and public planning according to Statistics Canada. For this study, information was gathered on the identified communities regarding highest degrees of education obtained for individuals aged 15 years and older and population employment participation rates. Table 3 depicts 2006 census data on each community's total population, population aged 15 and older, high school graduation rates, post-secondary achievements and employments rates. Post-secondary achievements are broken down into Trades and Apprenticeships, Certificates and Diplomas, and University Degrees.

Community Engagement

Community engagement refers to a process where an organization or individual moving a community towards change builds relationships with members of the community to collectively plan a strategy for evolution (Sanoff, 2000). In this case, the engagement revolves around education programs and community preparation for LNG expansion in NEBC.

Community-Based Participation Research

Traditionally, researchers have acquired results for research from an objective stance using observational and quantifiable data, collected from the environment and participants (Shalowitz, 2009). This approach strips the participants of feelings and opinions. The approach further removes the consequences and bias created by the researcher's participation in the study. Community planning research has evolved from a top-down approach to a Community-Based Participation Research (CBPR)—a grassroots approach, empowering participants to shape their own opinions about their communities (Sanoff, 2000). The value incurred by this process is the inclusion of participant values and experiences, adding a dynamic layer of understanding that is often excluded in traditional research (Shalowitz et al., 2009). In addition to incorporating participant knowledge, the data is triangulated and reinforced by comparing results to similar studies and theories. This innovative system both harnesses community wisdom, while maintaining an "academic methodological rigor throughout the research process" (Viswanathan, 2004, p.3).

All individuals involved in CBPR are participants including the researcher. From the researcher's perspective, the practice of working with people directly within a community is a rich learning experience. Face-to-face interactions facilitate the development of true relationships with participants and a deeper understanding of the dynamics and emotions involved in the planning process.[43]

There are a number of principles CBPR follows which revolve around the participation of community members and researchers and with the collaborative development of a project. This environment fosters a co-learning experience where all individuals involved feel empowered in the decision making process. It is important that all participants in the study and research results in action, understand that the process requires a long-term commitment from all partners (Moreno, 1995). Advantages to using CBPR are pronounced in the quality of the outcome of the project. The use of community based knowledge and perceptions, which include local values and goals, give the project credibility and enhance its usefulness (Israel Schulz, 2001). The collaborative and relationship building nature breaks down cultural barriers and compiles varied knowledge from a range of stakeholders (Stevens Hall, 1998). The space provides researchers with a rich learning experience, and allows them to practice using innovative adaption of existing resources (Stevens Hall, 1998). Finally, the process both empowers communities by affording them tools to build capacity, and ultimately builds trust (Stevens Hall, 1998).

There are a number of challenges associated with CBPR planning: gaining trust of the community and sub-communities, loss of interest for a project and the ability to implement the results of the research. In addition, due to a number of reasons, the population in which you desire to work with may not be willing to participate. The consequence of this may be an underrepresentation of the community and therefore inadequate research results (Watts, 2008), and this limited partnership can end up in a lack of action from participants (Mosavel, 2005). Another deterrent is an inability to implement services due to lack of funds or resources or because of time constraints (Holkup, 2004). If a project takes a long time to produce results,

43 For a narrative of Ms. Botta's personal experience with the interview process and her homestay in West Moberly First Nation and Fort Nelson First Nation, refer to appendix F.

community members tend to lose interest when they have already invested much of their time or personal responsibility taking precedent to the project (Holkup, 2004).

This research study aimed to use CBPR methods in obtaining information on education gaps in NEBC with the expectation that information from the study would be used by OAG companies to tailor education program(s) for suitable for CSR. A home stay was organized to familiarize the researcher with the region and First Nation culture and values, untimely developing relationships with community members and a platform for future partnership given education program development. The interview process used for gathering local knowledge followed the CBPR model, using grounded theory for analysis, as will be discussed in the next section.

Grounded Theory

Grounded Theory is a widely used methodology for systematic analysis of qualitative data, in this case 21 interviews and 3 focus groups. This methodology allows researchers to develop a theoretical account of the general features of a topic while "grounding the account in empirical observations or data" (Glaser & Strauss, 1967). This method incorporates the human experience, capturing the narrative or story surrounding the topic of research. This research study aims to decipher education gaps in NEBC, in relation to population preparation for expanding industry. The narrative from the interviews and focus groups displays themes and builds on the inquiry as to what education gaps exist.

Translating the narratives into data requires multiple steps. The interview question must be designed to provoke opinions and rely on descriptive answers. During the interview process there was limited note taking in order for the interviewer to focusing attention on the interviewees. After the sessions were complete the first stage of code development occurs where the interviewer reviews the notes taken during the interview and makes a memo of emerging themes. Recorded interviews are transcribed and uploaded into specific software for further coding. Themes are organized through a hierarchy of nodes, parent, child and siblings. According to Glaser & Strauss as the narrative is fractured and organized, the data begins to present a story of its own, or a "grounded theory."

Data collection and analysis for this research project took place in multiple stages for each interview. Each interview was recorded using two recorders (to ensure data was not lost), and transcribed. A codebook was developed and used over the course of the interview process, which drew out the important themes for theory and model building (Decuir-Gunby, Marshall, & Mcculloch, 2011; Kodish, Gittelsohn & Hopkins 2011). An inductive coding method was used because the purpose of this research is to collect information about the subject matter, rather than formulate a hypothesis. The theoretical data is represented in a Word-Tree using NVivo software.[44]

Interviews: Participants and Interview Questions

Analysis of interviews with local representatives from education providers and community planners was conducted to draw out Northern thoughts and perceptions regarding the expansion of the OAG industry. The interviews were designed to bring out information relating to education and employment opportunities as well as anecdotal comments from participants in relation to education planning and preparedness. This activity identified critical limitations in educational delivery and can help industry better plan for long-term education and training strategies.

The average length of each interview was 45 minutes to 1 hour. The interviews were captured by audio recording and then transcribed. The 24 interviews and three focus groups took place over the span of three months.[45]

44 Nvivo is computer software was developed by QSR International to analyze detailed qualitative data such as interviews or multimedia sources.
45 Refer to Appendix B for a list of interview participants.

CHAPTER 5: GEOGRAPHIC RESULTS AND ANALYSIS

Introduction

Many jobs in oil and gas (OAG) require post-secondary degrees or trades certification, for which math and science knowledge is mandatory.[46] Furthermore, these skills are transferable to many other industries in the region, as depicted in table 2 below. There are many local businesses in NEBC hiring tradespeople, and the demand is going to grow substantially. Identifying education avenues for youth that lead to employment in OAG will require an analysis of available schools to different communities and an acknowledgment of the consequences access to schools has on the outcome of employment participation in the OAG industry. The *Northwest Regional Skills Training Plan 2012* called for an assessment of regional disparities as a critical step in recognizing education gaps. This study aims to fulfil this knowledge gap with an analysis of community access to education, cross-referenced with census data on education achievement and employment participation.[47] Trends from these findings will be further explored through in-depth interviews with local education experts and community developers.

Results and Analysis

This section discusses the results of the geographic analysis of community access to education and highlights how the findings are pertinent in answering the research question: *"How can geographic analysis and community engagement be used to plan focused education programs, related to preparing a population for a resource extractive industry?"* For a detailed account of the calculations used to decipher school accessibility and capacity for each community, refer to Chapter 4: Geographic Analysis of Education Access.

Information from this analysis can be used to understand the disparities in education access across the region, and the relevance access has for education attainment and employment opportunities. Furthermore, the results help supports the theory that community engagement is a necessary step in understanding community needs, and therefore crucial for community

46 Refer to Appendix C: School Programs and Prerequisites, for an outline of available post-secondary opportunities and their pre-requisites.
47 Table 3 shows the data collected from the 2006 census used in this study.

development and education planning. Also this section covers the limitations of this methodology, highlighting weaknesses in the results as insight for future project developments.

Table 2: Competing Industries for Trades

Competing Industries for Trades

TRADES	OIL & GAS	SOLID WOOD	PULP & PAPER	MINING & SMELTING	UTILITIES
Industrial Electrition	X	X	X	X	X
Industrial Instrument Mechanic	X	X	X	X	X
Industrial Mechanic (Millwright)	X	X	X	X	X
Machinist			X	X	
Metal Fabricator (Fitter)		X	X	X	X
Petroleum Equipment Installer	X			X	
Petroleum Equipment Service Technician	X			X	
Planner Mill Maintenance Tech 1		X			
Planner Mill Maintenance Tech 2		X			
Powerline Technician					X
Rig Technician	X				
Sawfiler		X			
Shipwright					
Steamfitter/ Pipe fitter	X	X	X	X	X
Welder	X	X	X	X	X
Winder Electrician					X

High Demand/Competition

Medium Demand/Competition

Less Demand/No Competition

This table helps illustrate which trades certificates are most useful across different industries, and the competition amongst different industries for specific trades. The top row of the table depicts active industries in NEBC. The furthest left column shows trades programs available at NLC. The trades certificates have been ranked based on flexibility within different industries, with green being adaptable to many industries, yellow being moderately adaptable and red being specialized to one industry. The competing industries for trades data was collected from the *Career in Trades* website (2015).

Table 3: Census Data

Census Data 2006

	Total population	Youth population 5-24	Adult population 25-64	Highschool Equivalent	Apprentice/ Trades program	Certificate/ Diploma	University Degree	Labour Force Participation Rate
Fort Nelson	4514	1815	2600	28.2%	19.2%	29.8%	9.2%	87.2%
Fort Nelson First Nation	359	215	225	17.8%	24.4	13.3	0	56.6%
Prophet River First Nation	129	55	65	15.3	23%	15.3	0	66.7%
Halfway River First Nation	170	70	85	0	11.7	11.7	0	56.5
Blueberry River First Nation	185	105	80	12.5%	6.25%	6.25%	0%	61.9%
Doig River First Nation	124	50	75	14.2	0	14.2%	0	52.9
Fort St John	17400	9545	9325	28%	15.2	24.7	12.2	80.5
Hudson's Hope	1012	275	550	40%	10.9	15.5	15.5	67.3
West Moberly Lake First Nation	51	20	25	40%	0	40%	0	71.4
Saulteau First Nation (2011)	320	112	X	X	X	X	X	X
Dawson Creek	10994	3803	5685	26.3	14.4	21.7	10.6	72.5
Chetwynd	2,633	975	1450	31.3	14.5	26.2	8.9	76.4

This table shows census data from 2006 for each community in the study, except Saulteau First Nation, as no information on this community could be found. Data included population demographics, education attainment and labour force participation rates.

Calculating Proximity

In order to calculate school proximity a number steps took place; 1) a stock of all primary, middle, secondary and post-secondary schools operating in the region took place, 2) a valuation of the schools was administered, giving weight to secondary schools and post-secondary opportunities, as these education avenues are more directly related to job training, 3) commuting time between all communities that hosted schools was calculated to gauge access to schools in nearby communities, 4) driving time was valued to support shorter commutes. From this point an education access score for each community was calculated, by multiplying the valued schools by their distance and tallying the results.

Table 4: Commuting Times Between Towns and First Nation Communities

Towns & Schools	Fort Nelson	Fort Nelson First Nation	Prophet River First Nation	Halfway River First Nation	Blueberry River First Nation	Doig River First Nation	Fort St John	Hudson's Hope	West Moberly Lake First Nation	Saulteau First Nation	Dawson Creek	Chetwynd
Fort Nelson	0	10	62	212	300	278	242	X	X	X	X	X
Fort Nelson First Nation	10	0	72	222	310	288	257	X	X	X	X	X
Prophet River First Nation	62	72	0	127	200	X	198	X	X	X	X	X
Halfway River First Nation	212	222	127	0	120	X	93	X	X	X	X	X
Blueberry River First Nation	300	310	200	120	0	84	75	X	X	X	X	X
Doig River First Nation	278	288	X	X	84	0	50	X	X	X	X	X
North Pine	257	267	X	X	80	38	25	85	X	X	X	X
Prespatou	X	X	X	X	53	77	72	X	X	X	X	X
Fort St John	242	252	198	93	75	50	0	63	X	X	59	100
Hudson's Hope	X	X	X	X	X	X	63	0	29	40	124	56
West Moberly Lake First Nation	X	X	X	X	X	X	93	29	0	10	101	33
Saulteau First Nation	X	X	X	X	X	X	103	39	10	0	111	43
Dawson Creek	X	X	X	X	X	X	59	124	101	111	0	68
Chetwynd	X	X	X	X	X	X	100	56	33	43	68	0
Groundbirch	X	X	X	X	X	110	62	90	70	80	30	37
Farmington	X	X	X	X	X	90	42	98	97	107	18	66
Pouce Coupe	X	X	X	X	X	X	69	129	88	98	12	76
Rolla	X	X	X	X	X	X	66	123	X	X	19	83

- Drive < 10 minutes
- Drive < 30 minutes
- Drive < 60 minutes
- Drive < 100 minutes
- Drive >100 minutes

This table shows commute times between communities, where blue is less than 10 minutes, green is less than 30 minutes, yellow is less than 60 minute, red is less than 100 minutes and grey is more than 100 minutes. For the purpose of this study, only commute times under 60 minutes will be considered, however it is interesting to note how many more communities would be considered proximate to one another had the driving time limitation been extended.

Table 5: Education Access Scores: Proximity and Education Stages

	PRIMARY SCHOOL (0.25)			MIDDLE SCHOOL (0.50)			HIGHSCHOOL (0.75)			POST-SECONDARY SCHOOLS (1.00)			
Towns/ Communities	**Drive < 10 minutes (1.00)**	**Drive < 30 minutes (0.75)**	**Drive < 60 minutes (0.25)**	**Drive < 10 minutes (1.00)**	**Drive < 30 minutes (0.75)**	**Drive < 60 minutes (0.25)**	**Drive < 10 minutes (1.00)**	**Drive < 30 minutes (0.75)**	**Drive < 60 minutes (0.25)**	**Drive < 10 minutes (1.00)**	**Drive < 30 minutes (0.75)**	**Drive < 60 minutes (0.25)**	**Access to School scoreS**
Fort Nelson (FN)	FN 3 = 0.75 FNFN 1= 0.25 **T = 1**	0	0	FN = 2 FNFN = 1 **T = 1.5**	0	0	FN = 2 FNFN = 1 **T = 2.25**	0	0	FN = 1/2 **T = 0.5**	0	0	5.25
Fort Nelson First Nation (FNFN)	FNFN 1= 0.25 FN 3 = 0.75 **T = 1**	0	0	FN = 2 FNFN = 1 **T = 1.5**	0	0	FN = 2 FNFN = 1 **T = 2.25**	0	0	FN = 1/2 **T = 0.5**	0	0	5.25
Prophet River First Nation (PRFN)	0	0	0	0	0	0	0	0	0	0	0	0	0
Halfway River First Nation (HRFN)	HRFN = 1 **T = 0.25**	0	0	HRFN = 1 **T = 0.5**	0	0	0	0	0	0	0	0	0.75
Blueberry River First Nation (BRFN)	BRFN = 1 **T = 0.25**	Buick Creek (BC)= 1 **T = 0.1875**	Prespatou (PP)= 1, **T= 0.0625**	0	0	PP = 1 **T = 0.125**	0	0	PP = 1 **T= 0.1875**	0	0	0	0.8125
Doig River First Nation (DRFN)	0	Rose Prairie = 1,**T = 0.1875**	FSJ = 9 CharlieLake (CL) = 1 **T = 0.625**	0	RP = 1 **T=0.375**		0	0		0	0	FSJ = 1 **T=0.25**	1.4375
Fort St John (FN)	FSJ = 9, **T=2.25**	RP= 1 CL=1 Baldington (BT) = 1 Taylor = 1 **T= 0.75**	Farmington (FRM) = 1, DC=9, **T=0.625**	FSJ = 5 **T= 2.5**	0	Dawson Creek = 9, **T=1.125**	FSJ = 2 **T=1.5**	0	Dawson creek=4, **T=0.75**	FSJ = 1 **T=1**	0	DC = 1 **T=0.25**	10.75
Hudson's Hope (HH)	HH = 1, **T=0.25**	WMLFN = 1, **T=0.1875**	CHTWD = 4, **T=0.25**	HH = 1, **T= 0.5**	WMFN = 1, **T= 0.375**	CHTWD = 4, **T=0.5**	HH = 1, **T= 0.75**	0	CHTWD = 2, **T=0.375**	0	0	CHTWND = 1/2, **T= 0.125**	3.3125
West Moberly Lake First Nation (WMFN)	WMFN = 1, **T=0.25**	HH = 1, **T=0.1875**	CHTWD = 4, **T=0.25**	WBFN=1, **T=0.5**	HH=1, **T=0.375**	CHTWD=4, **T=0.5**	0	HH = 1 **T=0.5625**	CHTWD = 2, **T=0.375**			CHTWND = 1/2, **T= 0.125**	3.125
Saulteau First Nation (SFN)	WMFN = 1, **T=0.25**	0	HH = 1 CHTWD=1, **T=0.125**	WMFN =1	0	HH=1 CHTWND= 4, **T=0.625**	0	0	HH=1 CHTWND=2, **T=0.5625**	0	0	CHTWND = 1/2, **T= 0.125**	2.6875
Dawson Creek (DC)	DC=9, **T=2.25**	Groundbirch (GB)=1 FRM=1 PouceCoup (PC)=1 Rola=1, **T=0.75**	Taylor = 1 FSJ=9 BT = 1 **T=0.6875**	DC=9, **T=4.5**	GB=1 FRM=1 PC=1 Rola=1 **T=1.5**	FSJ=5 **T=0.625**	DC=4 **T=3**	GB=1, **T=0.5625**	FSJ=2, **T=0.375**	DC=1 **T=1**	0	FSJ=1, **T=0.25**	15.5
Chetwynd (CHTWD)	CHTWD=4 **T=1**	0	HH = 1, WM = 1 **T=0.125**	CHTWD=4, **T=2**	0	WMFN=1, HH=1, **T=0.25**	CHTWD=2, **T=1.5**	0	HH=1, **T=0.1875**	CHTWD=1/2, **T=0.5**	0	0	5.56
													54.435

T: Frequency variable multiplied by distance variable

School Frequency Variable

Primary (k-4) = 0.25
Middle (5-8) = 0.50
Highschool (9-12) = 0.75
Post secondary = 1.00

Distance Variable

Drive < 10 minutes = 1.00
Drive < 30 minutes = 0.75
Drive < 60 minutes = 0.25
Drive > 60 minutes = 0

Drive = 15.50 - 11.625
Drive = 11.625 - 7.75
Drive = 7.75 - 3.875
Drive = 3.875 - 0

* Many schools were graded K-7, and 8-12, in which case adjustments were made.

The first column depicts all the towns and communities in the study with acronyms to refer to within the table. The top row is split into primary, middle, secondary (high school) and post-secondary schools depicting the valued variable associated with each stage. Directly below are driving times for each school category split into less than 10, less than 30 and less than 60 minutes with the valued variable associated with commute times. To calculate the education access score, multiply the number of schools in each category by the valuation variable, and then multiply that number by the commute time variable. Once each education stage is complete add the totals for the final access score (found in the last column). This total can then be compared with other communities. The green scores depict good access, the yellow mediocre access and peach poor access to education.

Proximity to Schools and Education Completion Rates

Table 6 illustrates the relationship between community access to schools and completion rates, gathered from the 2006 census data. The trend shows a positive relationship between physical access and high school graduation as well as post-secondary education attainment. Not surprisingly population size and remoteness play a large role in the accessibility of education to communities in NEBC. Larger populations draw more amenities, including schools. This is clearly visible from the high levels of education attainment from the four main towns, Fort St John, Dawson Creek, Chetwynd and Hudson's Hope. In contrast, most of the First Nation Communities with their smaller population sizes and remote locations have less access to high schools and post-secondary schools and struggle with high school graduation as well as post-secondary attainment. Furthermore, West Moberly Lake First Nation (West Moberly) has less than five times the youth population of Blueberry River First Nation (Blueberry), but because of its proximity to Chetwynd and Hudson's Hope, has an accessibility score almost four times higher than the remote community of Blueberry.

It is evident from the data that distance to schools and population size are not the only criteria for higher interest in education, and that using quantitative data analysis is not adequate in understanding gaps in education. For instance, Fort Nelson (FN) and Fort Nelson First Nation (FNFN) are located within 10 minutes of each other and have equal access to the same schools; however, FNFN does not have the same education attainment that FN has.

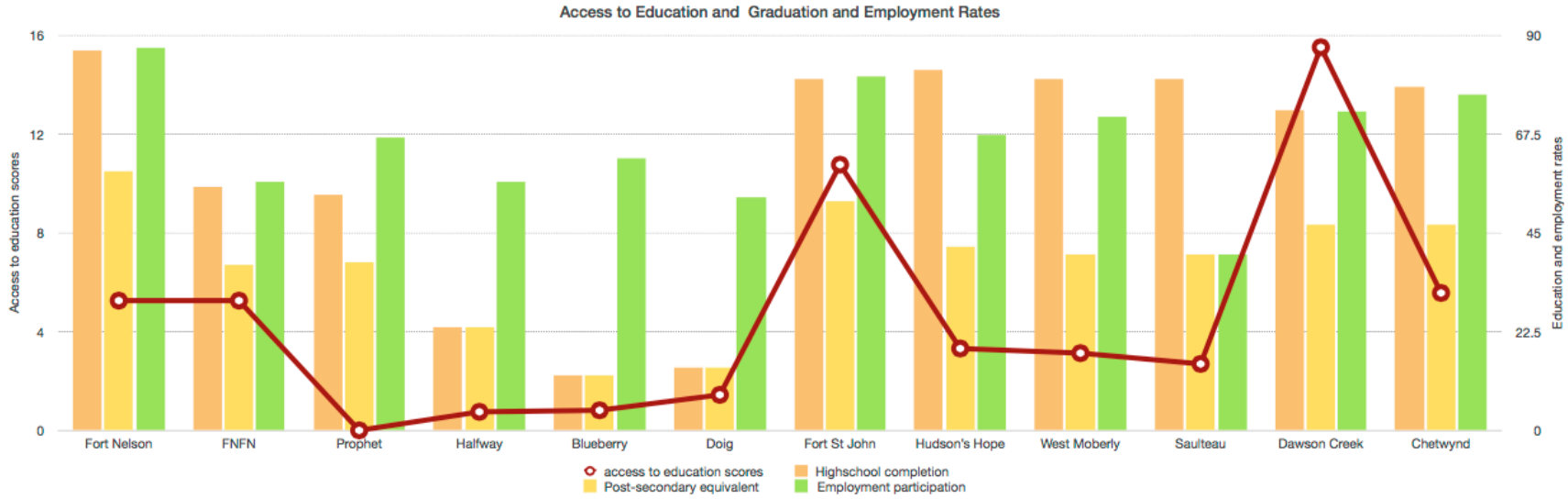
Doig River First Nation (Doig) and Blueberry are relatively close to one another, however Doig has a higher Accessibility Score (AS). This is due to the fact that when calculating proximity, Doig is barely under a 60 minutes driving time to Fort Saint John (FSJ), thus obtaining the benefit of access to many schools, while the drive from Blueberry to FSJ is just over 60 minutes, thus the AS is reduced significantly. These minor differences in driving times are subjective to a commuter, and the use of this analysis to distinguish between the nearby communities should take this into consideration. For further investigation on driving times, and the limiting factor of 60 minutes, refer to Table 4.

Prophet River First Nation holds a very low AS because the community is quite remote and there is no school on site. However, after a long struggle with the Federal Government the Band has since been granted two million dollars to construct a school for grades K-12.

Table 6: Access to Education and Graduation & Employment Rates

COMMUNITIES	ACCESS TO EDUCATION SCORES	HIGHSCHOOL COMPLETION	POST-SECONDARY EQUIVALENT	EMPLOYMENT PARTICIPATION
Fort Nelson	5.25	86.4	58.9	87.2
FNFN	5.25	55.5	37.7	56.6
Prophet	0	53.6	38.3	66.7
Halfway	0.75	23.4	23.4	56.5
Blueberry	0.8125	12.5	12.5	61.9
Doig	1.4375	14.2	14.2	52.9
Fort St John	10.75	80.1	52.1	80.5
Hudson's Hope	3.3125	81.9	41.9	67.3
West Moberly	3.125	80	40	71.4
Saulteau	2.6875	80	40	40
Dawson Creek	15.5	73	46.7	72.5
Chetwynd	5.56	78.1	46.8	76.4

This table and graph show the relationship between community access to schools and high school completion, post-secondary attainment and employment participation rates.



Education and Employment Participation Rate

Table 6 shows high employment rates regardless of good access to education, high school graduation rates or post-secondary education. There appears to be little to no significant connection between education and employment participation in NEBC. The region has the lowest unemployment rate in Canada, at 3.8%. This is due to expanding industry and spin off economic development. Industry attracts a range of employment, including low skill heavy labour and in NEBC these types of jobs provide decent salaries. Unfortunately, this situation dissuades young adults from obtaining post-secondary education, hindering their abilities to be promoted into higher positions. This trend will be further explored in the qualitative analysis chapter.

Capacity of Proximate Schools

It became apparent during the study that schools tend to get larger and fewer as grade level increases. In other words, there are more elementary schools which host fewer students than middle and high schools which are fewer and far between but host many students. The importance of this observation is with regard to student experience, as students pass from classes with fewer students and more teacher attention to those larger classrooms with less personal interaction with their teachers. Furthermore, if a community does not have the capacity to support a middle and high school, the children are expected to commute long distances or move to Fort St John or Dawson Creek to attend school.

The data in Table 7, depicting school capacity and proximity, has an alarming range; the spectrum covers extreme low and high capacity for students in their communities. Most of the anomalies can be explained through further investigation, solidifying the notion that community research must include an engagement strategy.

Table 7: Capacity and School Proximity

	Primary	Middle	Secondary	Post-Secondary
Fort Nelson (FN)	1.48	1.42	1.31	0.39
Fort Nelson First Nation (FNFN)	7.21	6.16	4.7	0.39
Prophet River First Nation (PRFN)	0	0	0	0
Halfway River First Nation (HRFN)	2.67	1.5	0	0
Blueberry River First Nation (BRFN)	5.6	2.78	2.68	0
Doig River First Nation (DRFN)	42.43	54.13	50.44	0.28
Fort St John (FSJ)	2.49	2.46	2.44	1.24
Hudson's Hope (HH)	1.80	1.08	0.8	1.99
West Moberly Lake First Nation (WBFN)	20	20.83	19.5	1.5
Saulteau First Nation (SFN)	3.35	4.68	3.55	0.60
Dawson Creek (DC)	2.34	2.43	2.33	1.45
Chetwynd (CHTWD)	1.84	2.36	2.68	0.85

Legend

- > 5 Over Capacity
- 1-5 Average Capacity
- < 1 Under Capacity

This table depicts the total capacity scores for the towns and communities. The number of available seats in proximate schools for each education stage was divided by total student population for each education stage. The number of available seats was taken from the BC Ministry of Education Website (2016), and the total student populations for education stages was taken from Stats Canada (2016). For the extended version of the calculations, refer to appendix D.

The colour coding highlights the trend for school stages to decrease in capacity as they move from elementary to high school and on to Post Secondary. Each of the identified communities has a fair amount of elementary school capacity, with the exception of Prophet River and Fort Nelson. As we learned earlier, Prophet did not have a school on reserve in 2006 and their location is more than 60 minutes driving time from nearby towns and other First Nations communities. Fort Nelson, on the other hand, hosts schools at every stage, yet ranked second lowest in their ability to serve their local youth population. In contrast, Fort Nelson First Nation (FNFN) demonstrates excessively high capacity for their elementary and high schools. The two neighbouring communities are 10 minutes apart and share school resources; therefore, their differing scores are troublesome. First, population size plays a strong role in the calculations, so smaller population with access to larger communities have exaggerated scores. Secondly, the census data from 2006 presented a different story than the one that exists today. Fort Nelson has experienced a decrease in population over the past few years due to industry downturn, and it is unknown how this has affected school capacity. The data collected for seat assessment in schools was retrieved from the Ministry of Education (2016) and is up to date.

Another irregularity was the low scores in Fort St John, where school accessibility is high. Further investigation into population demographics and scope would aid in deciphering how to amend the calculations used in this chart. The most significant conclusion is the tendency for schools to lose capacity as they gear towards adolescent education stages and post-secondary school. This theme ties into education models and teaching methods, both of which have an effect on the student learning experience. Furthermore, the issue of youth being forced to move away from home to attend high-school can be problematic for their mental and physical health as well as academic progress.

Limitations

There are a number of serious limitations in the analysis of community access to education, which may affect the outcomes, and validity of the results. Calculations for the accessibility scores was based on a valuation method found in *School Location and Capacity modification considering the existence of externalities in student school choice* (Castillo-Lopez & Lopez-Ospina, 2015). It is recognized that applying a value to a variable in a study is subjective; the

researcher used personal judgment to award value in this study. For this reason, the credibility of the results analysis could be called into question. For future endeavours, experts in education and transportation geography would be consulted for assessing value in school stages and commute times.

Key components are missing from this geographic evaluation of education access; student capacity from a couple schools is incomplete, along with the population size of Saulteau First Nation. During the research phase this information could not be obtained, thus leaving holes in the results framework. In these cases, an estimate was used based on available information from nearby school capacities and the West Moberly First Nation population size. It is recognized that this is not ideal, and further inquiry into these measures is necessary.

Statistical analysis of secondary graduates and post-secondary degree or equivalent obtainment does not take into account adult immigrants, who may have acquired their education elsewhere. To properly monitor education in the region a database and long-term study in partnership with local school boards would need to take place. During the interview process a few individuals complained about the lack of a database and student tracking capabilities to properly understand the movement of youth through education phases.

Finally, census data from 2006 was used to obtain information on population demographics, secondary completion rates, post-secondary degree or equivalent obtainment and employment participation rates for the communities in the study. Using data from a decade ago was necessary in order to find equal information on all the mentioned criteria. Unfortunately, this results in the information being out of date and therefore a misrepresentation of the current state of affairs. It should be noted that using census data is in itself problematic, as it makes assumptions about an entire population based on the truthful completion of a survey, to which not everyone responds. It is however, the most accessible and time efficient method of acquiring useful information on Canadian statistics.

Closing Statements

Despite some inaccuracies and limitation in the data, the analysis shows that the more remote First Nation communities are suffering from insufficient access to education, mainly due to remote locale. Furthermore, equal access to secondary and post-secondary opportunities does not exist; many youths in NEBC spend long hours commuting for essential education or having to move away from home at a young age. One can assume that youth overcoming access to secondary schools will have an even more difficult time enrolling in post-secondary school, which was exemplified in the comparison of access to schools to graduation rates and post-secondary statistics. The communities that stood out as having the biggest education gaps, in descending order were; Prophet[48], Halfway, Blueberry, Doig, Saulteau & West Moberly and Fort Nelson First Nation. Overcoming distance is not a simple matter and coming up with a strategy to overcome this gap will involve multiple stakeholders and creative planning.

Elementary schools outnumber middle, secondary and post-secondary schools. All of the communities in the study, except for Doig and Prophet, have nearby access to primary schools. Secondary schools are designed to serve a large student population, and the high schools in Fort St John, Dawson Creek, Chetwynd and Fort Nelson accommodate an influx of children from the local municipality and surrounding communities. The school capacity assessment for these towns was low, and considering the number of students commuting for school, the rate could be even lower. Having staff available to help students struggling to adjust to their new environment is an important process in overcoming the obstacle of alienation and high-school incompletion.

While the data did not show a significant relationship between education opportunities and employment participation, this information does not reflect on rates of LNG employment, as this labour requires special skills and training. Teaching students about employment demands and education avenues is an essential step towards tackling the skills deficit in NEBC.
A deeper understanding of school culture and the dynamics of education program administration is necessary to ascertain whether or not these findings would have an actual effect on students and the academic choices they make.

48 Prophet's education gap score will not be as high due to the construction of an on reserve K-12 school.

CHAPTER 6: INTERVIEW RESULTS

Introduction

For qualitative data analysis of the recorded interviews and focus groups, the recordings were first transcribed and then imported into Nvivo, where coding was applied. Word frequency and node frequency were used to derive themes to develop the coding book. Once this step was complete a word-tree was used to help arrange the themes, for coding query and matrix coding query. Figure 13 illustrates the complex nature of coding and theme building.

The core branches on the word-tree in figure 9 are the main themes that emerged from conversation with the interviewees. Splitting off from the main branches are the child nodes, or sub-category themes, topics in conversation brought up by multiple individuals. The presentation of these narratives in the following chapter will follow the hierarchy in which the software assembled the data. The main themes had similar node frequencies, thus it is hard to distinguish any one topic as dominant, however within the main themes, more variance occurred. In each section the narrative will follow the most significant subjects, leaving the less frequently mentioned topics aside.

To avoid redundancy a few alterations have been made to the results framework. First, the core theme 'Region' has been excluded from the results and analysis, as information on this theme was covered thoroughly in previous chapters such as; history and geography. Information from this theme will be included in the conclusion. Secondly, the core theme *First Nations* had overlapping data with the core themes, *Employment*, *Education* and *Community*, causing a great deal of repetition. To avoid this issue, the theme *First Nations*, was split up for inclusion in the three remaining themes. Lastly, the core theme *Personal Barriers* related to both education and employment obstacles, and is now only discussed under the core theme *Employment*.

The results are based around quotes from the interviews and focus groups participants, which bring the human context into play. This methodology allows the researcher to create a snap shot of topics are important to Northerners regarding education and LNG development. Local knowledge and perception can then be used to decipher important steps to take in alleviating the challenges involved in bridging the education gaps in the region.

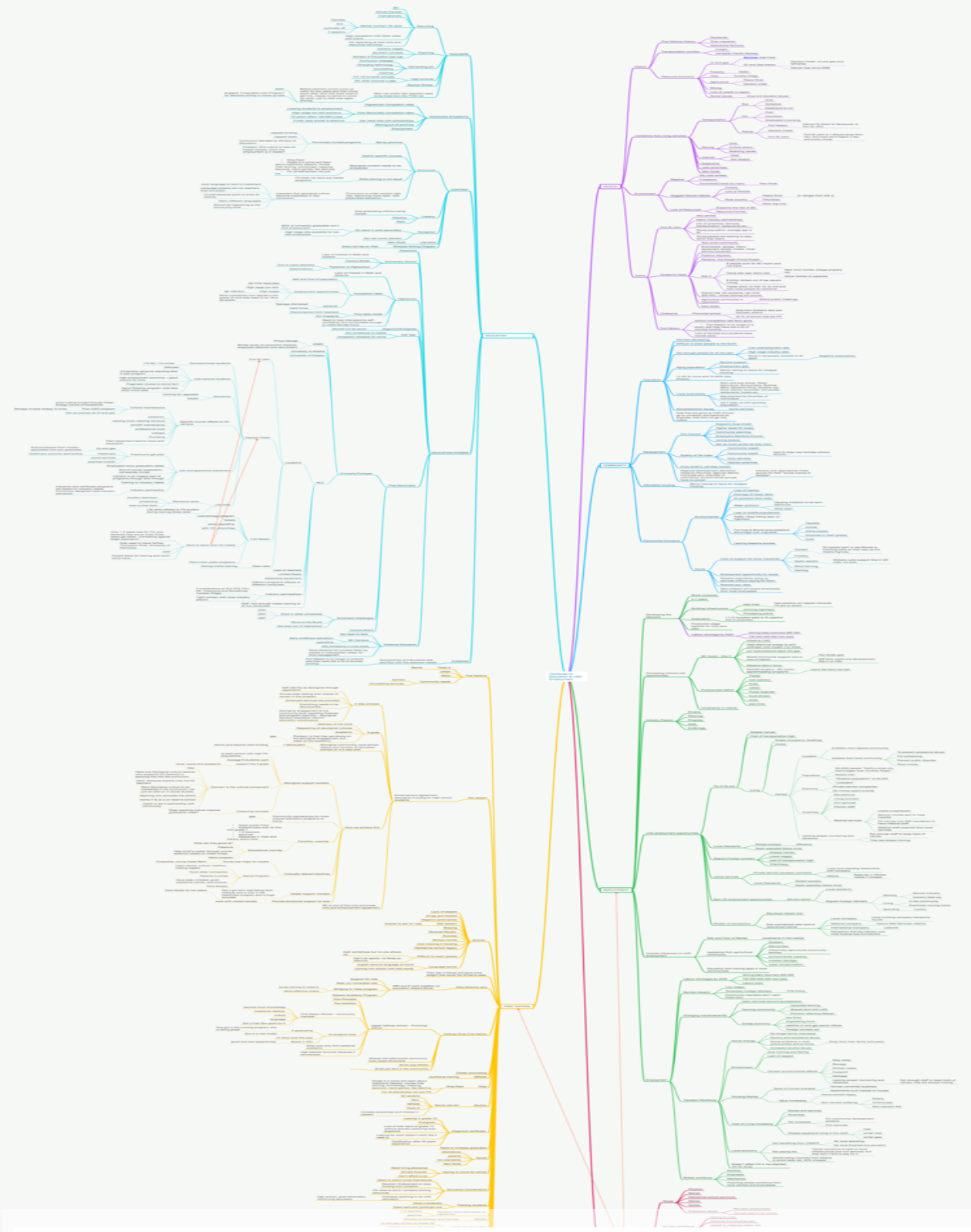


Figure 14: Word-Tree of Themes

This figure shows the level of detail involved in organizing and analyzing the qualitative data retrieved from the interviews. This image is not meant to be legible, rather it is meant to reveal the remarkable process involved in grounded theory analysis.

Theme 1: Community Development

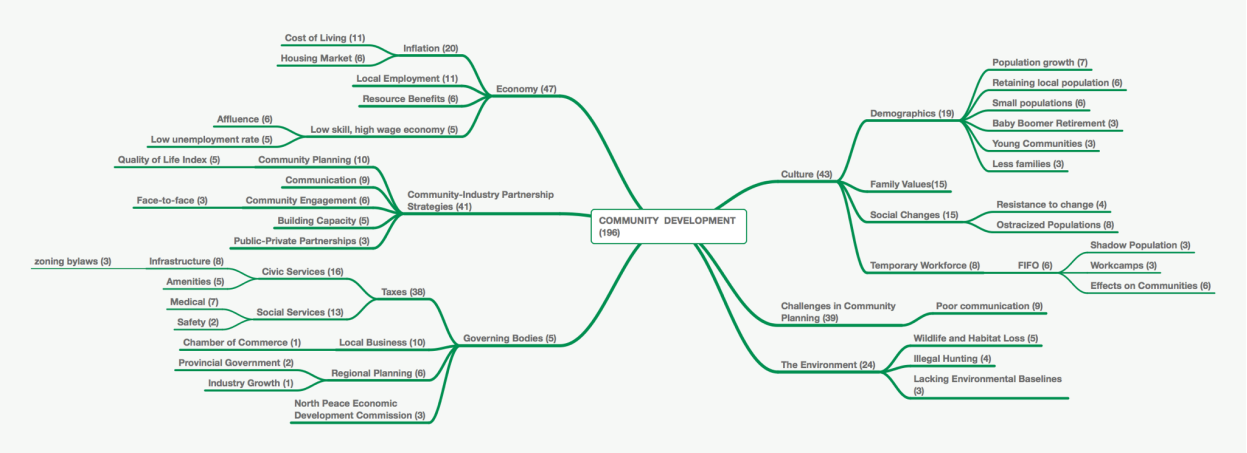


Figure 15: Community Development Word Tree

Community Culture

It was mentioned numerous times from varying townspeople that "maintaining a municipality that is family orientated, instead of transient" was important for their community development plan. The northern population is on average quite young, and many young people are still having children, but not at the same rate as it was in the past, according to a couple interviewees: "Kids these days want to get out and explore, and I don't blame them, I just hope they choose to come back" one concerned parents explained. Maintaining the Northerner lineage is important to both First Nations and descendants of settlers. Community growth and development was welcome to most as long as that rugged kinfolk culture was maintained.

There is a lot of history in the region and some populations are altogether against new development, including certain Bands and long-standing agricultural communities. An interviewee employed in local government (the Politician) explains the tension they experienced:

> "You know, change is always such a difficult component for people in different areas of a community and when you have such a strong foundation in your community with agriculture… Who have a generational transition of their family farms for 2 or 3 or 4 generations… their concerns about how industry will impact their way of life should be considered seriously. Some people are having direct

> impacts from the oil and gas industry as pipelines are being built and wells being drilled on their farms."

However, some farmers own large farmland and are pleased with the dual income, so there are always two sides to each story.

Transient Workers in Towns

Life in the camps can be difficult: isolation from family and friends for up to 6 weeks at a time, poor weather conditions, grueling work hours, monotonous setting, limited amenities and dry camp rules. This work environment can create social issues within the compound and during breaks, in nearby communities and/or at home. A few of the problems listed were: substance abuse, depression, aggressive behaviour, increased drug trafficking and prostitution. Often this transient community will "act without respect for the environment" or towns in which they "blow off steam after a long stint in the oil patch." The Executive Director from a local Chamber of Commerce (the Fisherman) discussed the degree of illegal hunting and fishing the FIFOW partake in during their breaks.[49]

Local Economy

The NEBC region is dependent on resources, which has provided communities access to many resource benefits. The Politician stated during their interview, "it's crazy how much money is pouring into the area as a result to our resources, it changes our economy and our communities!" With this affluence comes a number of changes to community living; expensive housing markets, increased cost of living, and changing cultural dynamics.

FIFOW

Currently large resource development projects, including OAG, are reliant on trained fly-in-fly-out workers (FIFOW) as the local communities lack the necessary skilled labour. The FIFOW population is roughly 25,000 people (mostly men) who reside in camps near operations. Camps can range in size from 50 people to the size of a small town; one camp was described as being "bigger than Tumbler Ridge," for its population of 2500. "There is a large demand for skilled

49 It is important to note that these types of social problems are negative externalities associated with numerous industries, and are not limited to Northern BC (Jenkins & Yakoleva, 2006).

labor, and until our own people can train themselves adequately, those jobs are going to go to outsiders. They have skills we don't have yet" the Politician stated.

A common concern expressed during the interviews was that this design creates a "shadow economy" (the Fisherman) where employees do not invest in local businesses or pay into taxes used for municipal development. Furthermore, the transient population put strain on civic infrastructure and local natural environment, and takes access to social services away from local people. Essentially, "they are flown into their designated camps, work for 21 days, get back on the bus, back on the plane and take the pay-cheque home," explains the Fisherman. Additionally, private service contracts for camps are usually given to pre-determined companies with long-standing affiliation with industry companies, further limiting the benefit these camps have for regional development.

Temporary Foreign Workers

The prosperous nature of work in the North does draw permanent residents, albeit not enough. The growing service sector is not capable of competing for employees against the big industry wages. For this reason, there has been a large influx of Temporary Foreign Workers (TFW). An Executive Director from a different Chamber of Commerce (the Executive Director), describes the general consensus regarding TFW as "willing to work the positions locals are not interested in, such as the fast-food restaurants and beauty clinic positions." It is only when TFW "threaten to take high wage jobs that residents protest their rights to employment."

Challenges in Community Planning

Cost of Living

Many transient workers are settling in the region for short lucrative contracts, which has:

> "... a huge impact on the investment and development of our community, because people are building homes with suites, and then duplexes with suites, all of that to accommodate these workers. That changes the view that your communities have that typical single family detached home for a family to move into. They are now being filled with these temporary workers" (The Politician).

Home owners are excited that property values have increased more than 2.5 times in recent years; however, new families are under a lot of pressure with these high costs. Despite these changes, the Politician is convinced that permanent residents will settle eventually.

These changes are acceptable for those working in industry, however, for those people who cannot partake in the abundance, such as the elderly or people living in communities with an economic down turn, the increased cost of living is hard. A Band member from FNFN describes how "the inflation from industry has made the cost of living rise exponentially… you can really tell when you go to the grocery store and the price of meat just keeps going up." Living in the North is generally more expensive due to high heating bills, winter gear and winter vehicle maintenance; these costs have been compounded by increased costs of goods and services, and higher taxes. Furthermore, rent has risen drastically across the region, and is currently comparable to that of Vancouver, with prices ranging between $1800 and $2000 for a two-bedroom apartment. One interviewee complained that they had to send their mother to Saskatchewan due to housing costs and limited seniors assisted living.

Growth and Development

The Politician effectively explains the hardest challenges he faces in planning for his community:

> "Balancing growth with development is the number one problem in dealing with a growing economy. The challenge is how do you develop the infrastructure and desired amenities, which are both expensive to build and operate on a fixed level of tax revenue from the residents? Everyone feels the pressure of the growing tax burdens and the challenge is how do you build your community with the expectation that people are going to come and want to have an airport, and busses, arenas, and pools and all those things when they become more and more expensive? That's the challenge and the burden of any community today, how do you build a quality of life and the infrastructure needed for people to want to come and live in your community and stay there?"

When the Politician was questioned about what resources would be necessary to overcome these challenges, he exclaimed, "We need good community planners!"

Lack of Local Decision Making Power

A number of interviewees who worked for varying Chamber of Commerce offices complained about the lack of power they had in regional development. An employee from the Chamber of Commerce in Chetwynd shares their irritation;

> "The most frustrating thing when talking to any Local, regional district, municipal government, chamber of commerce, environmental group, is that all the decisions are made by the Provincial Government. Industry doesn't have to deal with us…Of course they do engage us to adhere to their 'social license to operate', but ultimately the power of regulation lies with the Province. The most we can do is share policy resolutions to move things forward."

Aboriginal Affairs and Northern Development Canada (AANDC)

Indigenous Affairs and Northern Development Canada (AANDC)[50] is one of 34 federal agencies working to improve First Nation livelihood. In BC, there are 10 offices working to support the federal government's constitutional, treaty, political and legal responsibilities to First Nations, Inuit and Northerners, with the support of sustainable community, land and resource development initiatives. Project management and fund administration is organized 95.5 per cent by First Nations.

Building healthier communities, fostering economic prosperity and improving governance will take education. AANDC provides support for services on reserves such as education, housing, community infrastructure and social support to Status Indians on reserves; administers the land management component of the *Indian Act*; and executes other regulatory duties under the *Indian Act*.

50 As of November 4, 2015 Aboriginal Affairs and Northern Development Canada has been renamed to Indigenous and Northern Affairs Canada.

Theme 2: Employment

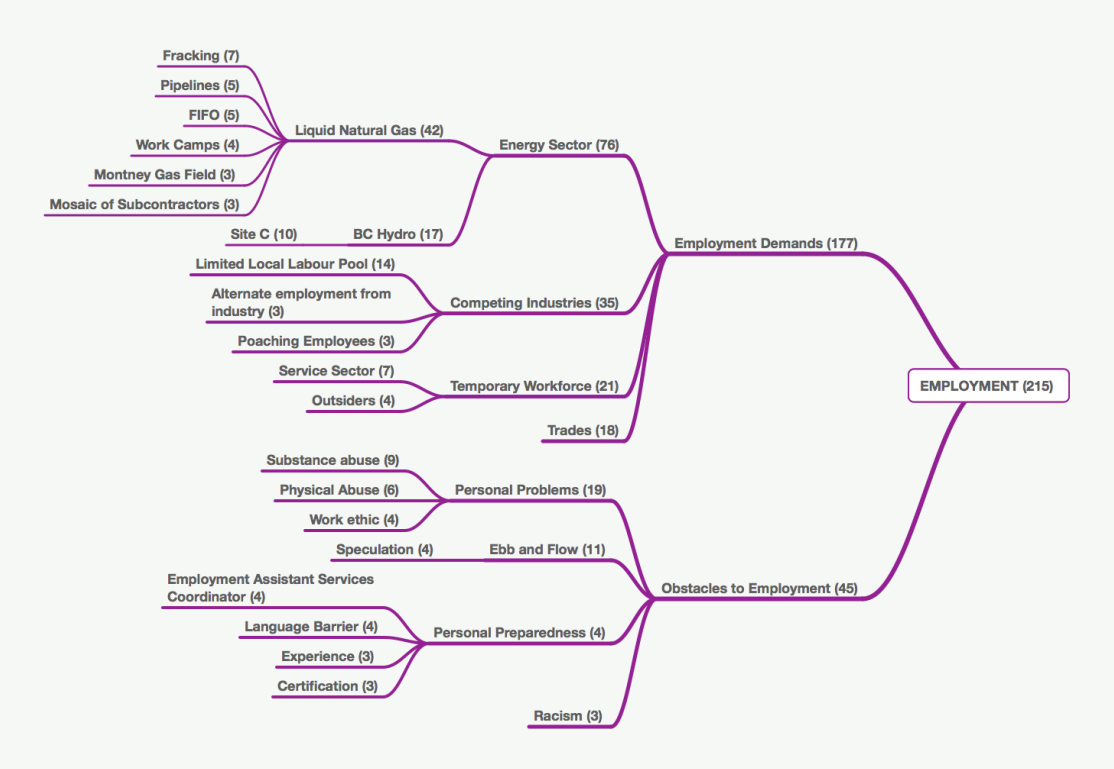


Figure 16: Employment Word Tree

Employment Demands

Northeastern British Columbia has a low unemployment rate due to a variety of rich resources and active industry sectors. At the time of the field work, the high labour demands had resulted in varied industry competing for local skilled labour and the necessary employment of temporary workers.

An According to an employee from the department of Trades and Continuing Education at NLC (the NLC Expert) “the region will experience a labour shortage between 150 000 to 200 000 jobs by 2020, due to Baby Boomer retirement, construction of BC Hydro’s Site C dam, and the expanding LNG sector.”

<u>Industry Competition for Resources</u>

This work environment supports a large number of low and high skill trades jobs with high wages. Competition amongst the industry sectors for certified tradesmen and skilled individuals

is high, especially for those skills that are transferable between industries, such as welding. For a detailed account of competing industry employment, refer to Table 2.

Industries also compete for community and government support; concerns have been vocalized by certain people or populations that environmentally harmful industries are favoured by the government over sustainable options like tourism. Many locals have protested the Site C dam, because it threatens sensitive habitat used by local Nations for Traditional Activities. The perception is that government will choose the pay-cheque over protecting the livelihood of local people. The Fisherman talked about the immense income generated by tourism along the Alaska Highway, and worries that HF Wells would ruin the beauty of the journey. "What would you rather see on a road trip? Moose or smoke stacks?" the Fisherman exclaimed, to bring home the point.

Employee Poaching

During the interviews the topic of employee poaching was brought up numerous times. Industry can offer higher wages than government positions, where pay caps are in place. Companies will "ruthlessly poach skilled workers" from all arenas. "Sometimes, employees will get called while they are working! It is very competitive!" the Executive Director exclaimed. The Executive Director follows this statement with an anecdote:

> 'BC Hydro held a Networking event in December 2014 to explain the construction phases of the Site C dam and the labour involved, some local business owners in FSJ attended because they were concerned that BC Hydro would poach their workers. With the need for skilled employees so high, there is a fear of losing trusted staff to higher wages offered by the bigger companies."

Growing Energy Sector

The most discussed industry was the energy sector, partly because it has the most influence in the looming employment boom and partly because of the interview questions. The Montney Shale gas reserve holds a massive amount of valuable liquids rich gas; the reserve has the potential for generations of employment and economic impacts in the region. It is important to understand how employment in this sector works; the NLC Expert explains nicely how a mosaic of subcontractors makes up the larger LNG sector:

> "When you think of oil and gas you think of the major companies up here, like Shell, or Altagas, but when you actually deal with the operating companies, you are connecting with their subcontractors. The major oil and gas companies subcontract their work here, so the people who are doing the various operations are specialists contracted for specific operations. For instance, Shell will own a well site and they will lease the site to Trinidad Drilling to manage the operation. Trinidad will contract all the liquids to be brought in by a certain trucking company. The labour contractor brings in all the people, who don't work for Shell or Trinidad; they work for the labour contractor. Thus, everything is broken down into specialties, it is a mosaic"

Developing the resource should take between 5 and 7 years, and will consist of short contracts in construction and exploration. Hundreds of kilometers of pipeline will be built and highways will be twinned to transport the gas to new processing plants. Exploration for good well sites will be mapped, as there will be 1100 to 1200 wells required to fill the suggested pipelines and meet government expectations for the resource. The production phase will see more careers for locals, as the mosaic of sub-contractors work on wells, pipelines and processing plants.

The Site C dam has mixed support from the communities, especially the First Nations whose traditional territory it will affect. The LNG sector is somewhat reliant on the construction of the second dam, as large amounts of electrical energy are required to make gas. The construction phase of the dam will involve a large labour force, but this need for people will dwindle once construction is complete. Due to past grievances from misconduct during the implementation of the W.A.C Bennet Dam and current concerns about the environmental damage from flooding the Peace River Basin, people either outright do not support Site C or have voiced their support of only one energy project, OAG or Site C.

Obstacles to Employment

After hearing residents discuss the impressive job opportunities, it is hard to understand how anyone has any difficulty acquiring jobs, especially when there is a plethora of low-skill high wage jobs available. As the geographic analysis section shows, education does not have a high correlation with employment rates. Despite these trends there is a large population of people in the north who struggle with acquiring or keeping employment. This section looks at identified

obstacles to employment outside of access to education and training which is covered thoroughly in other sections

Market Fluctuations

One of the main troubles people had with employment was the uncertainty of the market and how this effects job prospects. While experts are claiming there will be thousands of jobs, the current resource market downturn has caused stakeholders to question the validity of such high projections. The NLC Expert explains how economic speculation affects employment prospects and population preparation for employment:

> "Despite the fact that the economy here is quite good, there is still a great deal of speculation. We are still waiting to hear if LNG is going to come around. We are still waiting to hear about Site C as well. There is a lot hanging in the next few months, however we are meant to prepare anyways. If LNG finally settles in some time soon, the impact will be felt all the way to Kitikmeot, back here, and all the way up to Fort Nelson."

Industry downturn has already greatly affected Fort Nelson, where the forestry industry was hurt by international trade regulations and recently has seen a downturn in oil and gas production as well. "It's very very slow this year," exclaims a Principal from School District 81 (The Principal), "We've had tons of layoffs and tons of students and families have moved. So with that, the industries have left and so they've cancelled their scholarships." A Band Member from Fort Nelson First Nation describes the hardships he has experienced due to fluctuating markets:

> "After the forestry and oil and gas sectors both dwindled, it has been really hard to find work. I have been unemployed for years! It's depressing being dependent on the government for had outs. I want to be useful!"

Fort Nelson is not limited by lack of resources; their economic decline is man-made.

Personal Barriers

Studies have shown that people who are disengaged from society are often battling personal trauma, and for people growing up on Reserves, trauma is a common occurrence. A career

counsellor from the North East Native Advancing Society (NENAS) describes the people who come to the center for help with employment:

> "Many come with a lot of hurt and pain. You know. And so, we have to take that into consideration. We have to really look at that, because the way you treat people. It's really important to treat people with respect, regardless of what they've been through, right? You know, and because in a lot of times, they don't get that respect, right? And, if they don't get that respect, they feel low about themselves. Their self-esteem is way down there."

Empowering the vulnerable and creating an environment where they feel safe and valued is a crucial component to overcoming personal barriers.

Another issue that First Nation people deal with is racism. Employers use the excuse that Aboriginal people lack work ethic, are unreliable, and not valuable employees. In Fort Nelson an Education Coordinator stated that, despite high employment rates on the reserve, TFW are being shipped in to work in the service industry:

> "You know, I have been living in Fort Nelson all my life, and I have never hardly seen an aboriginal person working in Fort Nelson at the stores or in the restaurants or anything like that. They work in the hotels as cleaners, but they're not out in the open, working in the restaurant, they just aren't."

While it was apparent from the interview with the career counselor that many First Nations people do struggle with retaining employment, generalizing and avoiding the root cause of disengaged citizens is precarious.

Theme 3: Education

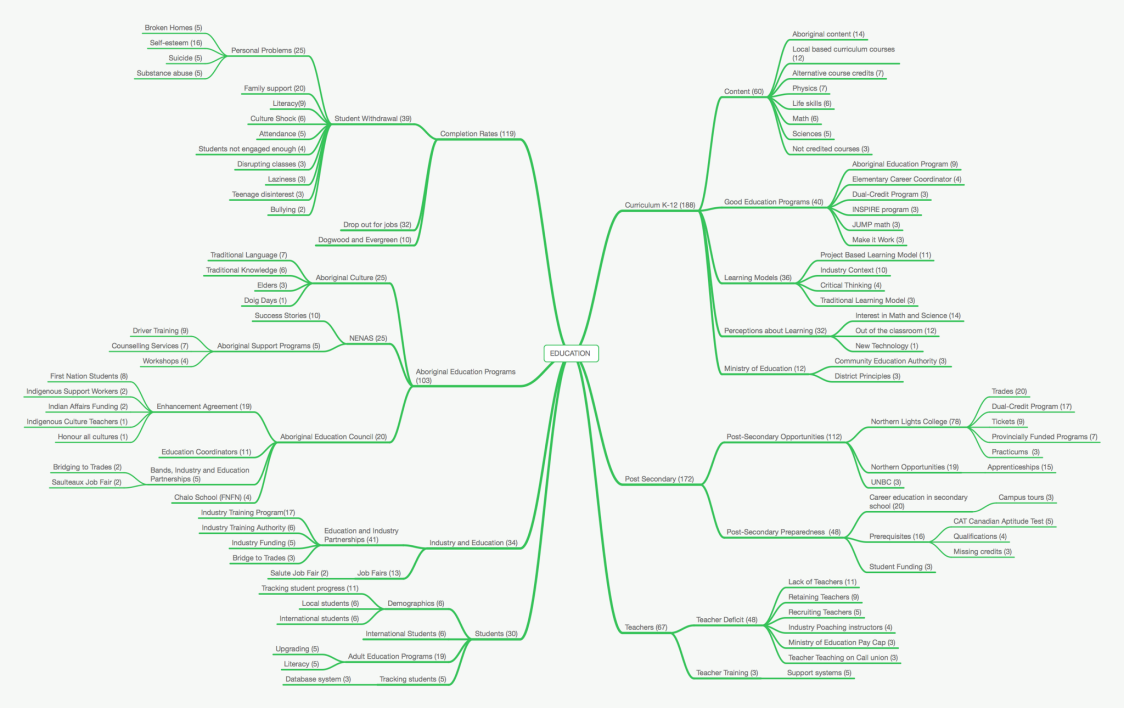


Figure 17: Education Word Tree

Unequal Access to Schools

As discussed in the geographic analysis of education access chapter, distance to schools, school capacity and transitions through education stages play an important role in completion rates and post-secondary enrolment. These themes were discussed extensively during the interviews and important information was uncovered to aid in the understanding of school accessibility.

Students living in remote communities without access to high schools and students living outside Fort St John and Dawson Creek who wish to partake in the Dual-Credit program are required to commute long distances for their education. There are a number of problems involved with this model; students are dependent on a scheduled bus or the ability to drive for their mobility or live in town at a designated boarding home, dormitory or apartment.

A concerned parent from Chetwynd explained her frustration at not having the Dual-Credit programs offered at the local Northern Lights College:

> "We need to be able to train our youth for employment! But the commute to Dawson Creek is too far! The dorms are expensive, and sending teenagers off to live by themselves at 16-17 is hard on them and their families. Plus, you have to be 17 to live in the dorms, so what are you going to do? Rent an apartment? There is a bus that runs, but it is 20 dollars a month and a hard commute to do twice a day."

Furthermore, First Nations youth moving to the cities from remote communities undergo a fair amount of culture shock resulting in disinterest in continuing studies. An Education Coordinator tells of her own experiences similar to many others:

> "Boarding is easier than travelling back and forth and but it is still hard, I know because when I was a teenager I did it. I mean, going and living in someone else's house, the rules change, like everything is different. I think that lots of the kids run into problems with that right away just because they aren't used to living outside their community and then all of a sudden moving to Fort St. John, it is very hard."

Having the freedom to drive at one's own schedule is difficult for many kids in the region due to the graduated licensing program and cost of owning a car. Organizing the learner's test, and subsequent road tests involved in acquiring a license is a barrier that many youths cannot overcome. "How is one supposed to drive to the GMV branch for their road test without a license?" one interviewee exclaimed, "It's a catch 22." A resident of Blueberry River First Nation further stated that many youths will end up driving regardless of not having a license, for work or for school, and when caught lose their rights to drive and ensue large fines which they cannot pay.

Local Post-secondary opportunities in NEBC are exclusive to the Northern Lights College, which has campuses in Fort St John, Dawson Creek, Fort Nelson, Chetwynd, Hudson's Hope, Tumbler Ridge and Dees Lake. The Tumbler Ridge and Dees Lake campuses are excluded from the study as they are outside the scope of the project. The campuses that provide a range of industry trades and specialized industry programs are limited to Fort St John and Dawson Creek. The remaining three campuses only offer adult upgrades, industry tickets, a few art courses, and

non-industry trades programs. Distance education is also available but is limited by poor Wi-Fi connections.

Students who wish to partake in the Dual-Credit program must commute every day or move to the larger centres. The NLC is required to hold a percentage of seats for remote communities; however, due to increased competition these seats are no longer secure. Some students have been forced to move as far as Thompson River and Kamloops.

Teacher Deficit

When discussing gaps in education, a common theme was the lack of teachers in the North. Recruiting teachers is difficult and retaining them equally so, the region experiences an annual turnover of roughly 25-33% in towns and 40% on reserves. There are a number of factors involved, including the Ministry of Education Pay Cap, the Teacher Teaching on Call Union, high competition with other districts, instructor poaching from industry and the Northern Climate and lifestyle.

Public schools including the NLC are funded through the Federal and Provincial Government, where teacher salaries are capped. This results in the inability for schools to draw more teachers with increased benefits. Teachers with the right skills are also prey for industry to poach, enticing them with salaries two to three times greater than what the government offers. For elementary and high schools this results in heavy competition with school districts with warmer or more cosmopolitan environments. The NLC Expert explained how difficult it was to find and retain teachers at NLC for their Trades and Engineering programs, necessary courses for the competitive industry-training environment.

In recent history the hiring protocol for new teachers changed, requiring all new teachers at a given school to be hired from the Substitute Teacher list. While this gave Teachers Teaching on Call (TTOC) a necessary benefit, it hurt the teacher pool for Northern communities. A staff member from School District 81 describes how:

> "...in the old days, fresh Education Graduates would come up here and to get a couple years' experience, so that they could apply competitively for positions in their preferred districts. The current status of teacher hiring protocol requires schools to offer positions to their TTOC list. "For example," she explained, "if you want to teach in Kelowna you have to be on their TTOC list. If you come up here and teach for two years then when you return to Kelowna, you still have to go back and go on the TTOC list. So you have to start over."

She explained that a possible solution would be a Forgivable Loan Program to provide teachers with incentive to work up North.

The teacher deficit has left many schools with teachers lacking the appropriate skills to teach some subjects, mainly in the science departments. Many of these more dynamic courses are being taught via tele-conferencing, which is not ideal. For this reason, a large gap was identified in teacher training, teacher upgrading skills, teacher support systems and tutoring for students. Some interesting solutions have been implemented with partnership between the school boards, universities and industry. An example being "'Inspire,' where industry funded the Scientists from the UBC yearly Resident program to visit School District 81 to teach the staff and kids some very cool science experiments. "The students love it and so do the staff, it is very popular!" From the earlier theme, Students and Completion Rates, we learned the importance of student teacher relationships, and teacher awareness of student health. An expert in innovative education from School District 59 (The innovator) passionately describes the modern teacher:

> "Good teaching is one of the most complex jobs there is. You have to be a counsellor. You have to know how to facilitate. You need to know how to teach. And the role is changing, because you're no longer transmitting information. You're activating and inspiring kids. You have to explore new things and develop those learning competencies. Being an active Role Model goes both ways too, we are learning from them as much as they are learning from us. To build trust it is important to believe in the students and discard blame, make sure that each student feels valued."

This inspiring interview illuminated the need to provide teachers with the training and support networks necessary to learn about these important steps towards improving young lives outside of traditional education.

Elementary and Secondary School

Canadian public education is funded and supervised by the federal, provincial, and local government. The Provincial Ministry of Education plans curriculum and District School Boards execute education programs within their jurisdictions.

Progressive Education Programs

There are a number of good education programs available to youth in NEBC such as 'Make it Work' for elementary school students and the 'Dual-Credit program' for grade 12 students, both are geared towards preparing students for labour opportunities in the region. Additionally, both programs connect students to industry-centric subjects and post-secondary opportunities through hands-on experience and learning initiatives. Despite these progressive programs, many individuals voiced their concerns that the "Provincially set curriculum did not allow local school boards enough authority to develop courses unique to the region." This was most evident with Aboriginal content, which continues to be "put under Social studies, or it would simply be an add-on sometimes" a Director of Aboriginal Education explains with frustration.

Learning Models

Learning Models are another important aspect of delivering education, what was learned from the interviews is the trend to move away from the traditional timetable model and towards project based and contextual learning models. To improve student interest in Math and Science, a shift in the perception that math and science is "boring" or "exclusive" will involve new ways of teaching the subjects. Research has shown that the factory model where courses are taught separately is less engaging for students than using projects that include a variety of subjects. This new model lends well to applying an industry context in which courses are taken outside the classroom and involve local industry partners. For instance, the District Principle relates how:

> "…The grade 12 physics class in Dawson's Creek involves a tour of the W.A.C Bennet Damn in Hudson's Hope, where they learn from specialists from around the province the types of careers available through BC Hydro. Students have an opportunity to critically think about how different components of their learning experience can translate into future job opportunities."

Transitions

During a focus group in Fort St John involving Education Coordinators from West Moberly Lake and Saulteau First Nation as well as a representative from the North East Native Advancing Society the topic of student loss of interest in school was tied to the transition from elementary to high school. It was noted that their students showed keen interest in Math and Science in elementary school, however exhibited a trend to lose interest in high school. This phenomenon is theorized to correlate with the transition from small intimate classrooms with strong teacher-student relationships to the large-scale timetable experience of high school, where students can feel lost. Furthermore, for those students commuting long distances, the obstacle of attendance becomes increasingly difficult to overcome.

Completion Rates

When education experts were questioned about the reasons for students not completing high school there were two predominant answers: that students left early to pursue employment or because of personal problems.

NEBC has the lowest unemployment record in BC due to a large degree of expanding industry. This employment environment provides many high wage-low skill labour opportunities that do not require higher education. The District Principal stated that 50-70% of their high school students had part-time jobs and that some of the employment opportunities available offer up to 90-100K salaries.

The Innovator explained how this is a trap for many young people:

> "There are young people who have gone into the job market, and they've gone in at entry level jobs, but they never moved past that, because they don't have the skills. Then they suffer with the ebb and flow of the market. When things are good, they may have jobs, but when things aren't good, they're the first ones to lose the job. And that can be extremely discouraging and disruptive to their lives."

Additionally, with such inflated incomes, young people invest in expensive commodities such as new trucks, skidoos and apartments, and when they lose their jobs they fall into financial deficit.

Personal problems are more abstract and subjective, and thus more difficult to explain and overcome. Many students in NEBC face racism and reverse racism, bullying, illiteracy, self-esteem issues, high suicide rates and substance abuse problems. Often (but not always) these problems can be linked to a lack of parental involvement or teacher awareness, broken homes, poverty and other trauma. On reserves, communities continue the struggle to overcome the Residential School legacy, which left many families torn apart by substance, physical and sexual abuse. Resource towns are not without similar issues, and awareness of student physical and mental health is a necessary role for a teacher. On a positive note, as discussed in the previous section, the rate of Aboriginal dropouts has decreased in many communities and there are a number of positive programs working towards mending some of these deep wounds.

Post-Secondary Education (NLC)

The NLC Expert was proud to discuss the strong relationship between industry and the NLC. Local industry stakeholders and business owners have been very supportive of the Dual-Credit program, which allows grade 12 students to acquire their high school graduating courses and first year university courses at the same time. Much of the trades and industry programs are based on industry needs and the curriculum is designed to meet industry standards. Graduates from the program have a multitude of job and apprenticeship placements available to them upon completion.

Post-secondary education preparedness

Trades and specialized industry programs offered at University and College require a range of prerequisites depending on the program. Refer to Appendix C for a detailed account of necessary prerequisites for a number of trades programs offered in NEBC. In earlier years, individuals could obtain trades certificates with average grade 10 education; however, the educational environment has changed. Most sought-after trades programs have become more competitive due to limited seats and high demand in NEBC, and now require high school graduation and better than average grades. While most high schools teach students about post-secondary opportunities, many families still find the process confusing and disseminating information to students and parents can be difficult. This process is made more troublesome in more remote areas where Wi-

Fi is limited, thus prohibiting a good platform for teaching families about their children's education options.

During the interviews the value of trades shows and campus tours as tools to explain job opportunities and avenues towards them was mentioned numerous times. Unfortunately, for communities such as Fort Nelson, there is an obstacle to bringing students to such events as they rarely happen in town and requires expensive transport and accommodation to the more southern towns of NEBC.

Many youth and adults who left school early with the Dogwood certificate are now returning to school to complete their high school credits. In Fort Nelson First Nation, adult education center enrolment is at an all-time high. The Education Coordinator suspects this increased interest is due to plummeting job opportunities in industry and increased spare time, a bittersweet victory.

Trades positions now require certification, which has been a serious obstacle for many elderly First Nation trades workers. Illiteracy on reserves is still high, and despite lifelong experience and mastery in trades, elders are being put out of work due to the inability to pass written exams.

Post-secondary preparedness includes financial planning, and although First Nations have access to band education funds, these funds do not cover short courses such as trades, and do not include living allowances according to an Education Coordinator. Unfortunately, the paperwork involved in applying for financial support is also a deterrent to many people. The North East Native Advancing Society along with Education Coordinators offer help in this regard, encouraging band members to take advantage of funding.

Capacity and Funding

Community members with access to the smaller NLC campuses voice their desire for access to useful trades programs; however, the college has no power to offer this. The limited seats in Fort St John and Dawson Creek and inability to expand trades programs to the peripheral campuses is limited by capacity and funding. NLC is provincially managed through the Ministry of Education and is required to offer a set number of seats arranged by the Ministry of Education and pay

instructors a set wage. Furthermore, it is essential to offer a specific number of arts courses despite the high demand for specific trades, such as welding.

Expansion of trades' courses is further limited by equipment, which is very expensive. Due to the ebb and flow of the market, it is not in the college's best interest to invest in more equipment given the possibility of industry downturn. Moreover, as mentioned before, the difficulty in retaining teachers is especially high in the trades, which further restrict the ability to expand courses.

Indigenous Education Programs

Education Coordinators

The Ministry of Advanced Education and Labour Market Development and Technology funds First Nation Education Coordinator (FNEC) positions for communities. These individuals aid students through their academic career, teaching them about resources and funding for post-secondary opportunities. A major task for FNEC is to solicit funds from third party donors, as government funding is not adequate to reach enough students. A problem one FNED coordinator discussed is the issue off-reserve Band members diluting their economic resources. Fortunately, the program has had roaring success. A proud Education Coordinator boasts about the successes of the program:

> "The First Nations contingent at graduation ceremonies keeps getting larger. Many of the Aboriginal students who have gone through the system over this last while have become professionals, technicians, and tradespeople who are now involved in establishing self-determination and development for our communities."

Ministry of Education – Aboriginal Education Enhancements

The Enhancement Agreements (EA) has three goals - to improve student health, honour all aboriginal cultures, and improve academic success. In British Columbia, students who are self-proclaimed Aboriginals, and have signed up for the program, receive additional academic support, take part in extra-curricular activities, and receive training and counselling that aid in the three goals. Schools with high First Nation populations will have onsite Aboriginal Support Workers who perform a number of activities that aim to support the three main goals of the EA.

These individuals will work with approximately 8 students each, providing additional support in means of tutoring, career counselling, coaching students with transitions from elementary school to high school and from high-school to post-secondary, providing emotional support and enriching aboriginal culture in the academic environment.

The "most challenging aspect is the culture component," explains a Director of Aboriginal Education, because the Aboriginal Support Workers are not certified instructors. This year they acquired an Aboriginal Culture Support Worker (ACSW) who works directly with teachers to develop appropriate curriculum. The problem is capacity explains the director, because there is only one ACSW and they need to move around to all the schools: "If there is a gap, that is it, I myself would like to have an Indigenous cultural teacher permanently on staff, so that you can have good indigenous culture imbedded in the curriculum."

Some interesting programs have evolved in NEBC through the EA, such as the Heroes program and Culturally Relevant Credited Electives. The Heroes program is a partnership between the Ministry of Education and Industry to empower Aboriginal Youth. The program involves directed career counselling aimed to help students recognize their talents and passions in order to strategize their academic and career goals. With a strategy in place, students have achievable pathways to success with support along the way. The program relies on the use of indigenous role models who act as mentors and Aboriginal Support Workers.

Learning Traditional knowledge and skills is now an option for kids to take as elective courses, "for instance there is a young man who traps for credits;" he was taught the skills by his elders, and assembled the knowledge for a course report. The dance program has been in effect for several years and is very successful, and "some of the older students are now the role models" and the community elders have initiated them; they have been given traditional names and colours for their regalia." The inclusion of Elders and family members goes beyond text book learning; it taps into the source of cultural value, and provides a space for inter-generational healing.

A milestone for the program will be the permanent inclusion of aboriginal culture and content in the curriculum. The obstacles to overcome include the fact that the BC Government continues to set the curriculum, which prevents the inclusion of adequate local context, a lack of qualified traditional knowledge experts with education backgrounds and teaching local language without being exclusionary of other languages and backgrounds.

Alternative Education Programs

In some communities, such as FNFN, there are some really great after school programs that teach kids about traditional culture and land use knowledge. This removes the necessity of being taught by a teacher, as most elders or other knowledge bearers may be experts in their field but not "certified". These outreach camps are wonderful opportunities for youth to interact with their elders and have hands on experience in their territories. Furthermore, the programs keep the "kids out of trouble," as a youth outreach program planner explained: "many of these kids turn to drugs and alcohol, these camps are dry, they show kids that they can have fun without that stuff, while learning essential skills." The charismatic husband and wife team who organize the excursions loved their work, one remarked that the "best part about teaching kids, is the learning you receive back from them."

North East Native Advancing Society (NENAS)

The North East Native Advancing Society is an organization that works towards improving the lives of First Nation people living in Northern BC, by providing opportunities for cultivating health, wellness, education, and economic self-sufficiency. The organization works closely with bands, communities, industry and government to deliver education and training programs that reflect community needs. Assessing needs on an individual and community basis requires deep understanding of life in the North and the trials and tribulations of overcoming racial tension, poverty and trauma. Their programs are geared towards integrating people into the workforce and therefore basic skills such as literacy, upgrading and help with applications for education funding. Other important support systems include daycare for children, counselling recommendation, space for elders and gatherings and a much-needed drivers licensing program for the communities.

CHAPTER 7: INTERVIEWS DISCUSSION AND ANALYSIS

This chapter discusses the themes that emerged from the interviews and conveys their relevance in answering the research question: "*Can geographic analysis and community engagement be used to plan focused education programs, related to preparing a regional population for employment in a resource extractive industry?* To support this inquiry, material from the literature review will be used to emphasize important concerns and community needs discussed in the interviews. The outcome of this analysis will drive recommendations for Oil and Gas (OAG) companies interested in funding education based Corporate Social Responsibility (CSR) projects related to population preparation for the expansion of OAG in Northeastern British Columbia (NEBC). Additionally, the limitations of this research methodology will be examined and the implications towards the reliability of findings and recommendations towards future work.

Theme 1: Community Development

When considering how resource development projects (RDPs) effect community development, the subjects of altering community culture and changing local economy were covered extensively in the literature review and during the interviews. While resource development offers employment opportunities and development funding, it also comes with the risk that cultural integrity could be threatened by transient employees and an influx of newcomers. For First Nations communities, the risk to community culture goes deeper, as RDPs can limit access to Aboriginal and Treaty rights in a number of ways. Buell (2006) discusses the risk-benefit analysis of RDPs for remote First Nation communities; the physical impact of a project and the employment offered both pose possible threats to community cohesion and culture. Additionally, as is the case in NEBC, RDPs that are dependent on a Fly-in-fly-out workforce (FIFOW) will draw resource benefits away from towns and communities while burdening the local environment, infrastructure and social services.

Community Culture

During the interviews, a number of participants expressed their concern that family values were being diluted by the transient population associated with industry growth, and emigration of local youth. Short contract based employment in OAG relies on individuals with flexible schedules, and could be seen as catering to single people rather than people with families. This is a perception skewed by individual observation, as clearly many people working in camps have families. With that said, averting local youth from moving away from NEBC would be beneficial for both long-term community and industry development. A stable community accustomed to northern living provides a stable platform for social and physical capital.

First Nation communities in NEBC have struggled with systematic marginalization and subsequent loss of culture caused by settlement, resource development and social discrimination. The Residential School system caused a legacy of sexual and physical abuse that exists to this day. Coping mechanisms, as explained by a number of authors including Buell (2006) and Render (2004), often materialize with substance abuse and violence. A resurgence of Indigenous pride is underway in NEBC as conveyed by a number of Band members during the interviews, and RDPs must not impede this process of self-determination. Empowering First Nation communities with capacity building tools, community health programs as well as protecting Treaty rights will support cultural strengthening (Pearson & Daff, 2010).

Local Economy

Direct and indirect employment opportunities related to resource development can revitalize a community. The issue with OAG and Hydraulic Fracturing (HF) is that the population in NEBC does not have the adequate skills to support the growing industry. For this reason, FIFOW have become an essential component to the industry and a visible addition to the NEBC population. Buell (2006) examines the impacts transient workers have on First Nation communities, findings from the study showed that when the negative externalities associated with FIFOW are experienced in a community without economic resource benefits, feelings of resentment and distrust grow.

In order for local communities to feel included in this expanding industry, it is recommended that OAG companies operating camps, partner with local businesses or companies that specifically train and hire local people for camp services. Additionally, a preferred local hiring program for skilled labour would mitigate the sense that jobs are being "stolen by outsiders."

Apprehension and fear were expressed regarding the environmental effects of work camps and HF. In order to relieve anxiety, local people need to understand the process and impacts of HF. Baseline studies and monitoring programs should be set up to examine; risks to wildlife, water use, water contamination and air emissions from upstream, midstream and downstream production (Garvie, 2015).

Community Planning

As discussed previously by the Politician, the revenue from resource development has brought a lot investment into the NEBC region, inflating the housing market and increasing the cost of living. Managing growth and development is an ongoing obstacle, as community needs are diverse and sometimes competing. Community members voiced their frustration at having no decision making power relating to regional development and OAG which ultimately effects their lives. For this reason, the Politician identified the lack of community planners as a crucial obstacle in managing community needs.

Sanoff (2000) outlines the benefits to using Community-based participation research (CBPR) to develop community plans. The grassroots approach empowers participants to shape their own opinions about the future of their communities. Using a (CBPR) approach for community development strategies in NEBC would bring local knowledge into the planning process, in turn giving the northern opinions value. CBPR is time and energy intensive for both planners and participants and would require a committed local team of skilled community planners to engage the variety of communities and their varying concerns and visions for the future.

Recommendations for future work

This research found that the analysis of the theme *community development*, that protecting local culture, acquiring resource benefits from OAG developments, protecting the environment, and

balancing growth and development are important concerns NEBC communities share regarding preparation for the ramp up of OAG in the region. Linking these topics to education programs would help build the capacity of communities to mitigate and manage the impacts of the exponential growth in the region.

At the cultural level, the importance of respecting local culture was expressed unanimously in towns and First Nation communities. For townspeople, this translated into providing stable careers for local youth, thus establishing family routes in the evolving communities. Supporting elementary, secondary and post-secondary education avenues that lead to local stable employment is covered extensively in the next section on education. Given the stated importance of preserving family orientated communities, it is recommended that this concept be included in the branding of education programs, by providing local opportunities for local people.

Promoting First Nation culture on reserves is an integral part of community development and healing. Through partnerships with Bands and cultural teachers, industry can invest in courses and workshops that teach about Treaty rights, traditional skills and knowledge to youth and interested Band members. Such is the mandate of the *Fort Nelson First Nation Lands Department,* including educational extracurricular activities for students and community members. Likewise, investing in a cultural awareness program for company management and staff would have the benefit of developing an awareness and respect for First Nation values, while conveying the message that the company is engaged in building a relationship and true partnership.

From an economic development standpoint, community members were worried that the industry reliance on FIFOW would prevent circulation of resource benefits within the community. It is well understood that improving math and science education as well as offering better post-secondary opportunities will aid in the preparation for specialized OAG employment. Additionally, supporting education avenues towards industry support services, such as camp management and amenity provision, would provide job opportunities for those individuals not inclined to work in heavy industry. Scholarships in business, administration, cooking, and other necessary roles should not be overlooked when discussing population preparation.

There exists a great deal of uncertainty in the general public regarding the environmental impact of HF and large industry camps. These apprehensions are more complex for First Nations, as habitat loss and contamination threatens Treaty rights. Partnering with local and provincial post-secondary institutions to develop education programs geared at preparing a cohesive baseline study and mitigating environmental effects would be a good way to establish local trust in the industry and build capacity to manage it.

Lastly, balancing growth and development in a way that meets community needs will be a complex process in towns and First Nation communities. Providing scholarships for youth interested in community planning in NEBC would be a progressive way for industry to support the planning processes without taking decision-making power away from locals.

Theme 2: Employment

The social climate in NEBC is charged with anticipation as the province continues to boast of the labour boom on the horizon. The themes that emerged in the interviews related to employment were community preparedness, competition between industries for resources, the energy sector, and individual obstacles to employment. Topics that were not covered extensively in the interviews, but are relevant to the theme of employment are issues related to Indigenous employment in the resource industry.

Employment Demands, Industry Competition for Resources and Community Preparedness

Emerging employment opportunities in NEBC mainly fall into the energy sector with BC Hydro's proposed Site C dam and the expansion of OAG through HF. The *British Columbia 2022 Labour Market Outlook* breaks down the OAG projection into phases of development, highlighting the fact that the majority of contracts will be in construction and last between 5 and 7 years. Longer contracts and career opportunities will require special skills and education. Other employment opportunities are in support services and spin-off industries.

Representatives from the chamber of commerce and the NLC discussed the topic of employee poaching, where industry seeks out skilled employees working in other fields, including

education, and entices them to leave their jobs for higher waged positions at their company. The competitive employment environment will only increase as labour demands grow.

This information strongly highlights the necessity to improve education avenues towards trades certification and degrees in science and engineering. Trades are generally more flexible and can shift laterally between industries. Engineering and science degrees related to OAG are more acute, however lend to ascension within the industry. Companies can aid in regional skills development by providing onsite education upgrading programs, which allow employees to remain at work rather than taking leave of absence to attend school (Ednie, 2004). To dissuade teachers from being poached, government grants could be issued to match industry wages.

Growing Energy Sector and CSR

The business structure of OAG using HF techniques has been described as a mosaic of specialized subcontractors, each working sections of the upstream, midstream or downstream process. Additionally, HF wells are relatively small compared to large-scale oil production and spread out over vast distances.[51] The issue with this design in relation to CSR is the shared responsibility of best practice and varying company capacity to support socially responsible projects. The scale of production impacts such a large region, that implementing education programs for employment preparation is formidable.

Obstacles to Employment

People in the north do not have equal opportunity to employment; remote communities have less options, market downturns or resource depletion cause abrupt unemployment, and certain populations struggle with social problems.

Market Downturns

Market downturns are a natural progression in the resource industry, managing these downturns takes flexibility and financial literacy. Resource dependent communities should work on

51 Refer to figure 5, for a visual representation of well distribution in the North Peace region.

economic diversification strategies. Preparing local people for market fluctuations could include onsite workshops on financial literacy and household economic planning.

Personal barriers

From a regional perspective, First Nation populations face greater challenges when entering the skilled workforce (Render, 2004). Buell (2006) outlines some of the obstacles First Nations in the north face in the resource industry, including remote communities having fewer employment options and education resources. The lack of education results in a labour pool with entry level skills; thus, these individuals procure shorter contracts and less economic security. Instances of abuse are compounded by poverty and inability to seek social services, which in turn hinders the performance of students in school and employees at work (Buell, 2006). The cyclical nature of these problems is at the forefront of Aboriginal rights and activism, as the current state of affairs continues to marginalize First Nations people, preventing equal opportunity in Canada.

First Nations and Employment in OAG

The OAG industry has a vested interest in employing local First Nations in and around the gas plays in NEBC. Not only do they represent a population close to operations, but their support of OAG expansion can streamline Treaty rights negotiations and Impact Benefit Agreements. The First Nations, on the other hand, are skeptical about how the industry will impact their socio-economic status. As mentioned earlier, on the one hand industry brings jobs, and on the other HF and OAG expansion could have negative environmental consequences and limit access to Treaty rights. A Band member from Blueberry River First Nation talked about how OAG projects had prevented access to family trap-lines, and Moose were being found with tumors in their innards.

Often the reasons an individual will not meet a company's initial qualifications for a job are low education levels, serious health problems, poor employment records and inability to pass a drug test, as supported in the interviews and authors Haley & Fisher (2014), Pearson & Daff (2010). Often women are excluded from opportunities due to lack of childcare and subsequent inflexible schedules (Haley & Fisher, 2014; Pearson & Daff, 2010). A mother from Blueberry talked about her experience working at a plant, explaining that although the pay was very good, she could not

work the 12 hours shifts because of her young son. Offering parents split shifts would be a great alternative to excluding those with dependents.

Retaining First Nation employees has been challenging for many mining operations and the same can be assumed for OAG. During the interviews First Nation high turnover in industry positions was mostly explained by personal problems, rather than conflicts with cultural activities. In contrast, Haley & Fisher (2014), Pearson & Daff (2010), discuss how work schedules often clash with seasonal hunting, gathering and ceremonies. Reports of high turnover with Indigenous employees has often been explained by poor work ethic and laziness, when in reality many individuals simply prioritize their cultural practice and identity over wages.

Allowing employees to take regular extended breaks is not typically efficient for industry jobs, as replacing and training staff is time consuming and expensive. However, with proper long-term planning, allowing cultural leaves of absence has proven to dissuade First Nations employees from leaving jobs and taking their training with them. At Teck Cominco's Red Dog Mine in Alaska, leaves for cultural activities have been incorporated into allowable time off, given appropriate notice (Haley & Fisher, 2014). Teck has worked hard to make their Indigenous employees feel comfortable and respected. Taking the time to learn about cultural habits and learning styles improved training, upgrading and promotions within the company (Haley & Fisher, 2014).

Recommendations for future work

The projected labour boom in NEBC exceeds the local population's capacity, regardless of population preparedness. There will be a need to bring in outside labour to help with the shortages, however employment opportunities should be primarily directed towards local people. Training the next generation will involve an investment from not only education institutions but government and industry as well. Companies can help by providing scholarships for local students. Furthermore, companies operating in the area can work with education institutions in providing youth with more exposure to industry through onsite visits and trade shows, explaining the work opportunities and prerequisite training necessities.

For those communities and individuals struggling with personal problems, acquiring and retaining employment can be a challenging. Investing in organizations, such as NENAS, that provide career counselling, life skills training, education funding and emotional support can help those less fortunate by affording them the tools they need to compete in the job market.

High turnover of indigenous staff in industry jobs is often due to work schedules conflicting with cultural obligations. It is highly recommended that OAG companies deliver cross-cultural training for staff and management in order to create culturally sensitive work environments.

When discussing the mosaic nature of OAG using HF, the notion of corporate practice and responsibility for community development was raised. With a multitude of medium to small companies, understanding how to support surrounding communities becomes challenging. The research question aims to suggest education programs suitable for CSR initiatives that meet community needs. Due to the nature of OAG using HF, and the diversity of communities in NEBC, suggestions from this research reflect a wide range of possible projects, with varying degrees of investment.

Companies with less capital to invest in CSR must find mutually beneficial projects that ultimately support operations and the surrounding communities. O'Faircheallaigh (2006) states the most critical problem for companies in employing local people is the lack of necessary skills, and insufficient opportunities to upgrade existing skills. Providing a community with the necessary education to partake in direct labour both supports HR demands and community economic development.

Theme 3: Education

Large-scale resource development projects bring economic development opportunities into the regions in which they operate, much of which presents in employment opportunities, social welfare programs and public infrastructure. Depending on the type of resource extraction, the range of entry-level to high-skilled labour will vary. For mining and oil and gas, many employees will require specialized trades certification or university degrees in math and science backgrounds. So the question stands: how can a resource extraction company promote job

opportunities to a population without the proper skill pre-requisites? One avenue is to invest in education programs that stimulates youth interest in math and science, while another avenue is to provide advanced education and training opportunities.

Improving education and related job opportunities in OAG for the Northeastern population is convoluted and will require ingenuity from education institutions, government, industry, community support networks and families. The most notable themes that transpired when discussing education gaps in elementary, secondary and post-secondary schools were; regionally unequal access to schools, teacher deficits, progressive education programs & learning models, school transitions & student interest, high school completion rates, post-secondary preparedness, NLC capacity and funding, Indigenous Education programs and First Nation extracurricular education. There are clearly many angles to investigate and not all will be covered in this paper.

As discussed in section 3.3.2, education has a direct correlation to the economic development of nations, however investment in education resources has varying effects depending on the physical and political environment of the society (Barro, 2001; Hanushek & Kimko, 2000). Additionally, it was found that the quality of education (math and science skills), had a greater positive impact on the "labour-force quality" of a population, compared to quantity of education (level of education acquired). This is due to the fact that math and science skills lend to careers in research, development and technological advancements (Barro, 2001; Hanushek & Kimko, 2000). These trends can be used to understand the education disparities amongst communities in NEBC and help plan for future regional education programming.

Regionally unequal access to schools

The *Northeast Regional Skills and Training plan* identified access to education as being a key factor when discussing education gaps in NEBC. The topic of education access was explored thoroughly in chapter 5, where the number of proximate elementary, secondary and post-secondary schools and school capacity was calculated for each community. School accessibility was then compared to average secondary graduation rates, post-secondary achievements and employment participation rates. It was found that remote and small communities lack both resources and student numbers to provide higher education opportunities. In NEBC this means

that many adolescent students are forced to commute long distances for high school and post-secondary education, including duel-credit programs.[52] Mobility is an additional factor in this equation, where access to transportation and bus services greatly effects a student's flexibility and ability to participate in distant education options.

Teacher deficits

School board representatives discussed the issue of attracting and retaining teachers, due to northern living conditions and pay caps. This problem is more severe at the NLC, where trades and engineering instructors are persistently approached by industry and offered more lucrative jobs.

Interestingly, none of the literature covered during research on education and training for employment at RDPs discussed teacher deficits. Not only does a shortage of qualified teachers create a knowledge gap in the education institutions, the high turnover of teachers creates instability in the classroom where students feel detached from their instructors. It was mentioned by education program experts during the interviews that this situation is critical for the learning experience, and those students with particular needs are less likely to receive the proper attention necessary to stay abreast with their peers.

Progressive education programs & learning models

Northern school boards are very well informed about how education programs relate to local employment opportunities, and the importance of promoting math and science to this regard. Each district boasted about their project based learning models, which tied a multitude of subjects to hands-on projects. Projects often included out of class room experiences, including field trips. School board representatives explained that this style of learning was both well received by students and provided youth first-hand experience with employment options in their region. Drawbacks to project-based learning models included a lack of available resources, teacher deficits and teachers lacking skills to teach certain subjects.

52 The duel-credit program courses are only offered at the NLC in Fort St John and Dawson Creek, students from surrounding communities who wish to enroll in this progressive program must commute or move to either of the towns.

The Aboriginal Education Center Vice President for school district 60 talked about the lack of aboriginal content and inability to include aboriginal content in the curriculum. This subject will be further discussed in the Indigenous Education theme below.

School transitions & student interest

It has been found that the transition from elementary to high school and high school to post-secondary can be stressful to students, especially when kids are forced to move away from home. Students who have had difficulty in attending secondary school are less likely to enroll in post-secondary school. Education coordinators from regional Bands discussed the problem of their local students' losing interest in math and science during the transition from elementary to high school. It is theorized that this problem is due to the change in classroom size and teacher-student relationship becoming more disconnected.[53] To manage this issue, transition coaches are available in high schools for students having difficulty adjusting to new living conditions and school environment. Haley & Fisher (2014) discussed how role models can have a positive impact on youth interest in academia, this concept has been incorporated into the Aboriginal Education Enhancement Agreement in NEBC through the Impact Society *Heroes* Program.[54] Youth attendance and interest in school is multifaceted including parent and support network accountability (Haley & Fisher, 2014).

Secondary School Completion Rates

Interviewees accounted for two main reasons for students not completing high school: either they left for personal reasons or they left for job opportunities. Personal reasons include, but are not limited to; low self-esteem, family obligations, substance abuse, and hard living conditions. The district principle for school district 59 explained how many students had part-time work, and the secondary class time-table was structured to accommodate half-days for this reason. Unfortunately, this does not always dissuade students from pursuing available job opportunities.

53 This theory has not been properly explored, and represents a gap in knowledge for education program planners.

54 The *Impact Society* is a non-profit organization working with education institutions across North America to help youth discover their inner talents and career goals. The society is funded by industry stakeholders in Oil and Gas.

The job market hosts plenty of low-skill, high-wage contracts that present as attractive alternatives to education. The long-term effect of this trend is young people being limited to hard labour with less opportunity for advancement, essentially stunting career growth. Some companies have taken steps towards preventing this behaviour by insisting in high school graduation as a pre-request for hire.

Post-secondary opportunities

There is a great deal of research pertaining to skilled labour gaps, industry employment and the baby boomer retirement (Ednie, 2004). Labour market projections theorize that there will not be a sufficient amount of qualified individuals to manage growing industry, or fill critical resource development roles (Ednie, 2004). For these reasons, government, education institutions and industry have been marketing trades as viable careers, an example being the *Industry Training Authority* in British Columbia. The situation in NEBC is somewhat unique in that current youth interest in trades programs over exceeds available seats offered at the local colleges. Competition for popular programs, such as welding, is high and normal pre-requisites have become insufficient for program admission. Many students with average to high grades in math and science are turned away from education opportunities that would lead to local careers.

Each community is given a percent of available seats at the NLC based on population size. It was noted by the Superintendent of School District 81, in Fort Nelson, that due to confusion regarding the system and competition with students from the larger towns, Fort Nelson seats are often given to other applicants. Additionally, pre-requisites for trades programs on the NLC website do not reflect the high level of competition and therefore necessary grade standards. These misunderstandings have prevented many youths from adequately planning for their careers.

When discussing the problem of seat shortfalls with the NLC Expert, a lack of capacity and funding was explained as the reason for not offering more courses. Trades equipment and labs are very expensive, and investing in these items is difficult to budget for when considering the ebb and flow nature of the resource industry. Also, an inability to acquire and keep instructors limits the capacity of NLC to expand seats.

First Nation students have funding opportunities through their Bands and the Federal Government, however Education Coordinators voiced the difficulty some students have in understanding and acquiring such funding. These opportunities are available not only to youth but continuing education candidates. Most industry jobs require proper certification for trades, which has forced a number of qualified First Nation tradesmen, who never attended school, to return and become certified. Unfortunately, this has caused problems for those Elders who struggle with literacy and cannot write the written exams.

Indigenous Education

According to the *Aboriginal Report 2009/10 – 2013/14 How Are We Doing?* Published by the Ministry of Education on Aboriginal Performance Data, Indigenous student high school graduation rates have risen from 54% to 63% in the last six years. This is still well below the BC average for non-Indigenous students who have an 86% high school graduation rate. These statistics prove that investment in Aboriginal Education Programming has been successful, but more work needs to be done to bridge the education gap. The indigenous population of Canada is growing 6 times faster than non-indigenous populations, and BC hosts 62,763 students.

As outlined in the *British Columbia First Nations Coordinators Handbook: A Guide for Serving Aboriginal Students in the Public Post-Secondary System in British Columbia,* providing better access to education for aboriginal students is a complex process which requires deep understanding of the academic, financial, social, and cultural needs of the students. Furthermore, it points out the difficulties in developing models to assist students within education institutions, which were not designed to support aboriginal people or their communities. Education programming and curriculum historically "did not acknowledge their history, systems, current realities, or goals" (Simcoe, 2003). As is evident from interviews with the Band Education Coordinators, First Nation people are still hurting and working to overcome great trauma in their lives, and with that pain comes insecurity and lack of self-worth. One Education Coordinator states that "Many of our young people – and not so young people – still don't believe that they can master education."

Over the past decade much has changed, the Ministry of Education and Aboriginal Affairs funded educational programs that aimed to support First Nation students from elementary to post-secondary school. Education institution have worked to alter their internal systems to better the education experience for their First Nation students; with the provision of support staff and career counseling, along with designated spaces for First Nation Students. Additionally, cultural practice and the inclusion of community members have created a more inclusive environment for kids and their extended networks.

Post-secondary education institutions have developed specialized enrolment policies and provide sponsorships and scholarships in collaboration with bands. This year, Universities Canada publically announced their rejuvenated commitment to aid in the success of First Nation people through improved institutional engagement with communities, enhanced education opportunities, leadership roles, and imbedded indigenous content in curriculums. Tim McTiernan, a member of the Board of Directors is quoted:

> "These commitments go beyond individual supports and acknowledge the need for a whole-of-community approach and meaningful interaction and dialogue. They recognize the importance of providing greater exposure and knowledge for non-indigenous students on the realities, histories, cultures and beliefs of indigenous people in Canada. And they underscore the need to foster deeper intercultural engagement among indigenous and non-indigenous students, faculty and staff."

Limitations of Analysis

Interview Data

The interviews were meant to produce a snap shot of the northern perspective regarding education avenues available in NEBC that supported youth skills development in industry, with an emphasis on OAG.

The northern 'perspective' is skewed by the scope of participants, which was limited to individuals from; School Districts 59, 60 and 81; Northern Lights College in Dawson Creek; Band Education Coordinators from, Chamber of Commerce, Municipal Government representatives from Dawson Creek, Chetwynd and Hudson's Hope, Northeast Native Advancing Society and the Fort Nelson First Nation Lands Department.

Due to financial, time, navigational and coordination constraints, the following target interviews necessary to fulfill the study scope were not completed: NLC campuses in Fort St. John, Fort Nelson and Chetwynd; Band Education Coordinators from Doig River, Tsay Keh Dene, Kwadacha, Prophet River and Daylu Dena; and Chamber of Commerce from Fort Nelson; and Municipal Government from Fort St. John. Additionally, it is recognized that representation from industry, Ministry of Education, BC Government, Northern Development, Treaty 8 Tribal Council, and number of other stakeholders and rights-holders involved the socio-economic development of NEBC communities would have strengthened the outcome of the study.

The interview questions were set up to delineate current conditions in NEBC related to expanding employment opportunities in the oil and gas industry; determine gaps in education and training resources that would enable local inhabitants to participate in the expanding employment opportunities; and identify causal conditions, as well as action strategies for bridging determined education gaps. However, the approach to certain subjects was limiting in that the questions lead the answers rather than providing the appropriate open ended style recommended for grounded theory. This caused bias in the results, based on the construction of the questionnaires. Furthermore, misinterpretation of the difference between FIFOW and TFW and the socio-economic impacts of either population caused a misguided emphasis on TFW and the service industry, which was not relevant to the study.

Scope of the Project

The purpose of the study was to investigate regional discrepancies in education that would hinder the NEBC population from participation in the escalating OAG industry. While this information is important for NEBC communities and OAG industry stakeholders, the design of the study focused on the region, rather than examining specific communities and populations. It did not take into account the scale of the study region or diversity in and amongst the communities at hand. A more efficient and accurate depiction of education gaps could have been obtained with a smaller study region and more interviews. Moreover, the interviews should have clearly outlined the difference between First Nation communities and towns, prior to analysis. These variations would have reduced the necessity of calculating education access used to highlight varying community education amenities.

External factors

During the research study period, the price of oil and gas dropped and OAG companies have stalled or backed out of planned expansion projects, leaving many northerners unsure of the future and how to prepare for it. This occurrence caused a sharp turn in community perceptions and expectations of the industry, and therefore altered the stance on educational preparation. The NLC Expert noted the difficulty in expanding trades programs based on expanding industry, because of expensive equipment, lack of instructors and market fluctuations. OAG prices have not recovered and uncertainty in the market continues.

Another factor which may affect the outcome of this research is the approval of BC Hydro's Site C Dam in the summer of 2015, shortly after the interview process for this study was completed. It was expressed by a number of interviewees that some community opinions regarding OAG development was dependent on whether the dam would be built or not. For instance, Doig River First Nation stated they would only support one energy project, not both.

Interviewee Bias

The interviewees were selected with the expectation that their responses would be truthful, however this does not exclude the subjective nature of opinion and standpoint. Given that the research study was focused on education gaps and participation in expanding OAG, responses were varied and perhaps guarded depending on the representative. For instance, Band Education Coordinators and Indigenous Education program representatives spoke openly about the obstacles First Nation students face in the education system, however few School Board representatives identified this theme.

Representatives from the towns and First Nation communities had diverging concerns and expectations regarding community preparedness and OAG development. In some cases, the discussion of LNG was emotionally charged, as environmental and social impacts from increased production continue to be unknown. In these situations, the subjects of community preparation and education gaps were lost to personal fears and apprehensions regarding the industry as a whole.

Researcher Bias

The researcher has an academic background in Geography and Mining Engineering, with an emphasis on community planning, and a professional background in community health. Prior to this study, the researcher examined numerous CSR projects and published a paper that discussed the importance of education programs in CSR implementation. This understanding founded the theory that education as a CSR initiative is a mutually beneficial endeavor for both communities and companies alike. For this reason, the study is shaped around the researcher's subjective interests and expectations of future outcomes.

Summary of Key Findings

In relating these limitation, the researcher aims to explain how executing a study and analyzing the results is a learning process in and of itself. While the limitations appear to be extensive, the invaluable information acquired over the course of this project relating to project design will strengthen further work based on this study, and in education gap analysis research in general.

Bridging Education Gaps

While industry cannot directly affect curriculum as the Ministry of Education manages it, companies can work with local school boards and schools to develop class projects that include math and science in a contextual sense. Companies can do this by offering hands-on experience within their trade that directly correlates to classroom lessons, both providing an active learning experience and exposing students to employment opportunities.

A less involved approach for improving the classroom experience is hiring a third party Education Program Administrator, such as the Pacific Institute for Mathematical Science (PIMS), who provide progressive education programs for both teachers and vulnerable youth. The Teacher programs work with In-Service teachers to upgrade their teaching methods for math and science, giving them creative and interesting ways to reduce the perception that math and science are "boring." The Youth programs are geared towards enhancing math and science skills, preparing students for transitions, career counselling, teaching leadership skills, and improving self-esteem.

Direct funding to teachers and students is a straightforward method for improving certain education gaps. For instance, industry and government could offer student loan forgiveness to teachers willing to work in the Northern communities for a specific duration of time. This would reduce the high teacher turnover and draw more teachers to the region. At the post-secondary level, providing grants for Trades teachers to remain in their teaching positions rather than transitioning into industry would benefit the college and industry in the long run. To improve local curriculum and Aboriginal content, a scholarship program could set up for individuals keen to study indigenous culture, acquire a teaching degree and teach in NEBC.

A difficult education barrier in NEBC is the remoteness of varying communities. Remote communities often do not have proper access to education and therefore youth are expected to commute long distances, increasing the chance of disinterest in school. Furthermore, distant communities have less capacity at proximate schools to cover necessary courses and are reliant on teleconferencing for specific classes. Distance education is further complicated by poor Wi-Fi connections. Industry could invest in transportation solutions, such as a driver license-training program. This would give students more flexibility with their commuting schedules and freedom to return home at their own convenience, alleviating the stress of moving away from home early. Enhancement of Internet connections in remote communities would both improve distance education and provide more information dissemination about employment and post-secondary opportunities to students and families alike.

Another interesting solution to distance is bringing education to the communities, such as on-reserve trades training, and the provision of local trades shows or online training programs. Hands-on local training has been successful in the past. For instance, the Bridge to Trades program, implemented by NLC in collaboration with a mining company and participating bands, provided on-reserve mining courses for West Moberly Lake and Saulteau First Nation. Bands have the additional benefit of government funding, which enables them to hire teachers and trainers at a higher rate than local education institutions. Partnerships between Bands, education institution and industry can provide great opportunities to develop progressive education programs.

CHAPTER 8: CONCLUSION

This thesis intended to evaluate the current education programs using community engagement and a geographic as tools to perform an education gap analysis in Northeast BC. The context of the study was based on the need for large-scale resource development projects to employ local people rather than rely on FIFOW, which is shown to both disrupt local communities and incurs substantial costs to companies. Improving the labour-force quality may require investment in education and training opportunities. An assessment of local education resources and deficits can help target investment and streamline community development projects.

To explore this subject, the study examined oil and gas development in Northeastern British Columbia using a community-based participation research (CBPR) practice coupled with a geographic analysis of education access. The CBPR approach involved face-to-face interviews and focus groups and the data was analyzed using grounded theory. Additionally, the researcher spent time visiting First Nation communities prior to the interviews with Band Education personnel to establish relationships and acquire an awareness of the local culture, values and interests. These methods were chosen for to comprehend the regional education prospects, local thoughts and opinions on education, employment opportunities and community preparedness of the expanding industry, thus the overall aim was to establish a platform of contacts for future education program planning.

The research objectives were to: 1) explore the evolution of CSR in the resource industry, and connection to community development around operations; 2) relate local education and training opportunities to employment in the resource industry; 3) use geographic analysis of education amenities to pinpoint regional disparities; 4) practice community engagement techniques to build a database of community thoughts and opinions relating to population participation in resource development; and 5) present education programs tailored to community needs suitable for industry investment.

The following conclusion reviews the effectiveness of the methodologies used in answering the research question and meeting the research objectives. A constructive criticism of the research framework will be followed by recommendations for future work and an outline of current working projects based on the findings.

Literature Review

Prior to field work, literature was reviewed on CSR, community engagement, education and job training, and indigenous employment in the resource industry. It was found that resource development projects have a significant impact on the socio-economic and physical environment around operations, and obtaining community consent requires careful consideration of local interests and economic development. Employing local people allows for resource benefits to circulate within nearby communities, however skills development is reliant on a number of conditions including (but not limited to); quantity and quality of education opportunities in the region, the political and physical environment, culture and historic relations.

Because indigenous populations often reside near remote operations, recruiting and training indigenous people is often seen as a mutually beneficial endeavor. Nevertheless, the literature showed that companies face challenges when engaging indigenous communities without proper understanding of cultural values and concerns. Furthermore, the marginalization of indigenous communities around the world, and in Canada, has prevented equal access to social amenities such as healthcare and education, resulting in poverty and vulnerability. To overcome these obstacles, it is necessary to support indigenous self-determination and autonomy. In relation to this thesis, careful consideration was made to respect local First Nation customs and beliefs as well as use a CBPR method to capture and empower local thoughts and opinions on education and employment projects.

The literature review provided a solid background study on the critical role resource extractive companies play in community development and the importance of education for employability and economic growth, thus meeting research objectives 1 and 2. The review failed however, to provide action strategies for improving education quality within the school environment.

Understanding learning models and curriculum planning would be an asset in developing education programs meant to improve math and science skills in a population.

Geographic Analysis

The geographic analysis used objective information obtained from mapping tools, published school statistics and census data. Data from these resources was used to calculate each community's access to primary, middle, secondary and post-secondary education opportunities which was cross-referenced with high school graduation rates, post-secondary degree achievements and labour force participation rates. Additionally, the capacity of proximate schools was established to depict the range of education resources available to students, under the assumption that less capacity would lend to less education resources per student.

This method allowed the researcher to categorize communities based on available education amenities. While education access based on commute times was useful, it was found that slight variances in driving time greatly affected the accessibility scores for communities. Additionally, capacity of schools was exaggerated for small communities that were close to (proximate) to large towns with dense education resources, thus falsely presenting them as capable. These discrepancies could be amended by combining the data used to calculate access to schools and capacity, streamlining the tool, and providing a more accurate picture of education amenities available to the variety of communities.

The geographic analysis aided in the third research objective, to highlight disparities in the region. However visiting the communities and discussing education issues exposed falsehood in a number of outcomes, further supporting the necessity for community engagement for the creation of a community development plan. The interviews revealed a plethora of details, crucial to the study that could not have been conveyed by a geographic analysis alone.

Community Based Participation Research

Considering the troubling historical relationship Indigenous communities have had with 'outsiders' and resource development projects, it was not surprising to learn that gaining trust is the number one obstacle to overcome when approaching a community about projects that will

affect their physical, economic or social environment. CBPR is considered to be an ethical approach to research within the historical context of research injustices with disadvantaged communities, which have contributed to community distrust of research and hesitation to partner with researchers (Watts, McCormick & Young, 2008). Overcoming these challenges will require careful consideration of local community history and in-depth interviews to understand local perspectives and opinions.

The time spent as a guest in West Moberly Lake First Nation and Fort Nelson First Nation showed to be incredibly valuable, as the researcher came to know a number of community members and leaders interested in the outcome of the research. This experience partially fulfilled objective 4, and finalized the in-depth interview process.

Grounded Theory

The data for this study was extracted from 21 interviews and 3 focus groups, using grounded theory. The personal experiences and subjective nature of grounded theory is what makes the methodology enticing and interesting. Nevertheless, it was found that when used to analyze the dynamic and complicated topic of education gaps and employment preparation over a large region, the methodology diluted and misconstrued important facts pertaining to specific locations and populations. The outcome of this qualitative data analysis showed that the range in education gaps were pervasive, and thus inconclusive on a regional scale.

It has been said that there are essentially two norths, where First Nation communities have not had equal access to the same economic prospects that settler/newcomer communities have partaken in. Overcoming poverty, social injustice and deep-seated trauma are some of the obstacles these communities must overcome in the process of self-determination and autonomy. The research design did not take these imperative facts into account when planning the interview process and consequent grounded theory analysis. Grouping First Nation communities with towns in the regional scope was a great oversight, which diluted specific community needs through dispersion of data. Assuming that communities in an area the size of NEBC would have similar education discrepancies was naïve. It is recommended that any regional education gap

analysis using grounded theory, approach each community individually rather than as a regional unit.

Answering the Research Question

After analyzing the data results and examining the limitations, the methodologies choses have been found to be partially inadequate for use in developing focused education programs, relating to preparing a population for employment in a resource extractive industry. The results from this framework showed that the range in education gaps were pervasive and inconclusive on a regional scale. Layering the data from the geographic analysis with the interview themes did provide a framework for the development of education programs, as it is discusses below in current projects, however the amount of information did not make the planning process acute. Consequently, preventing the education programs from being "focused." To improve this process, the following recommendations for future work are outlined.

Recommendations for Future Work

- Extend literature review to include a section on learning models and curriculum planning for improving math and science abilities.
- Streamline geographic analysis tool to prevent discrepancies in driving time, population size and capacity.
- Build interactive GIS mapping tool for regional education gap analysis.
- Extend literature review to include community engagement strategies based on cross-cultural training and learning.
- Present research findings to communities involved in this research study, for their own interest and use.
- Perform more interviews from each community that includes more variation in backgrounds. Followed by grounded theory analysis on each community rather than regional unit. This will provide a more accurate depiction of each community's voice on education and employment topics related to OAG.

Current Projects

The findings from this research project were presented to select individuals from the executive team at the central Calfrac Well Services office in Calgary, Alberta. Several meetings were organized to discuss the significance of the results and the prospect of designing an education program initiative for their CSR support to communities adjacent to current and future operations. Enhancing education for Northern communities would positively impact local lives and the future labour demand deficit. Expertise from the *President and Chief Executive Officer, the Director of Industry and Government Relations, the Director of Employee Training and Development*, and *the Director of Community Engagement and Relations* contributed to a strategy for implementing education programs that would enhance the quality and accessibility of education to communities identified for necessary assistance. Furthermore, the plan was catered to Calfrac's resources and capacity.

The baseline and preliminary research highlighted communities in the NEBC study region that are in need of additional support they are: Prophet, Halfway, Blueberry, Doig, Saulteau, West Moberly and Fort Nelson First Nations. During discussions with the Calfrac team it was concluded that focused support would go to communities within the Montney region, as these communities would most likely be providing the bulk of future labour demands. Therefore, Doig, Blueberry, Saulteau and West Moberly First Nations have been selected as the primary locations for services, with the possibility of expansion into nearby towns.

In order to achieve the goals of the project, further community engagement and democratization of knowledge and decision-making is required. Using the expertise and resources form local stakeholders in education and community development will give the project credibility. Furthermore, it provides an opportunity for Calfrac to develop a good relationship with the communities it aims to support and work with in the future. The North East Native Advancing Society has been identified as an organization to partner with in further developing the project to its full potential.

Finally, the analysis and recommendations towards mitigating education gaps pulled from the interviews and focus groups were used to develop the *Aboriginal Education and Engagement*

Initiative, and completing the fifth research objective. There are three stages for implementation: the first is to provide a driver's license and training program, the second is the sponsorship of a PIMS workshop for teachers in the communities and the third is to provide industry specific training and upgrading for math skills.[55]

55 To review the Aboriginal Education and Engagement Initiative, refer to Appendix E

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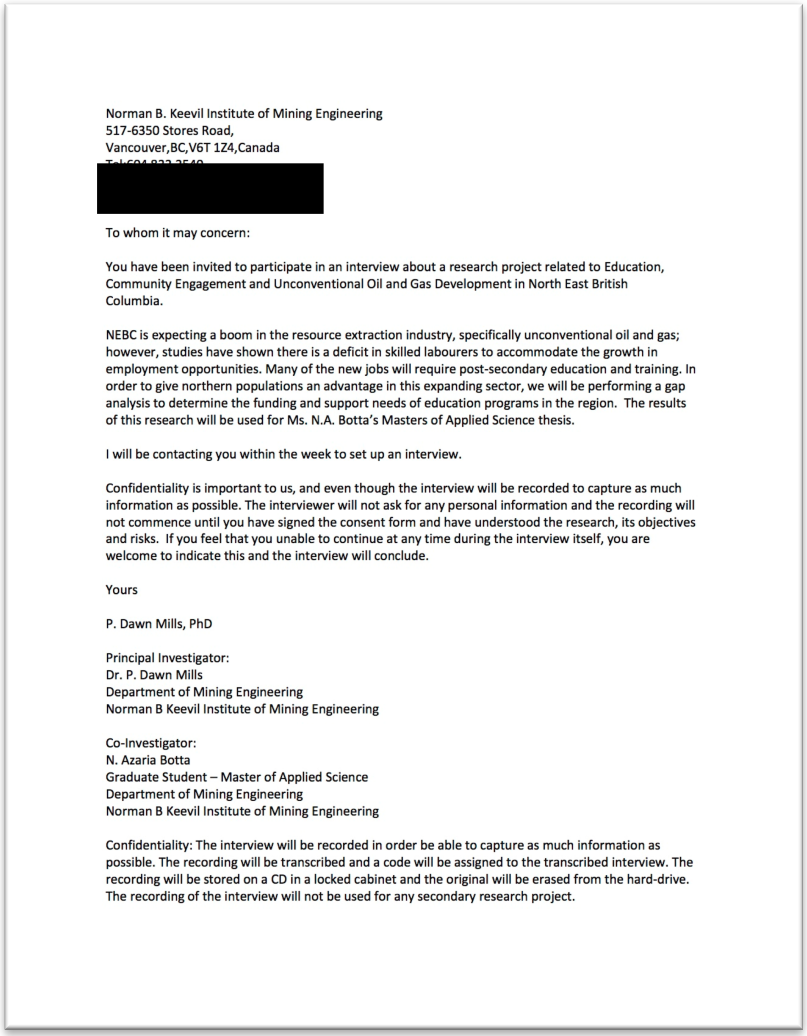
Appendices

Appendix A: Ethics Review Documents

Introductory Letters and Telephone Script

Email Introduction



Norman B. Keevil Institute of Mining Engineering
517-6350 Stores Road,
Vancouver,BC,V6T 1Z4,Canada
Tel:604-822-2540
[redacted]

To whom it may concern:

You have been invited to participate in an interview about a research project related to Education, Community Engagement and Unconventional Oil and Gas Development in North East British Columbia.

NEBC is expecting a boom in the resource extraction industry, specifically unconventional oil and gas; however, studies have shown there is a deficit in skilled labourers to accommodate the growth in employment opportunities. Many of the new jobs will require post-secondary education and training. In order to give northern populations an advantage in this expanding sector, we will be performing a gap analysis to determine the funding and support needs of education programs in the region. The results of this research will be used for Ms. N.A. Botta's Masters of Applied Science thesis.

I will be contacting you within the week to set up an interview.

Confidentiality is important to us, and even though the interview will be recorded to capture as much information as possible. The interviewer will not ask for any personal information and the recording will not commence until you have signed the consent form and have understood the research, its objectives and risks. If you feel that you unable to continue at any time during the interview itself, you are welcome to indicate this and the interview will conclude.

Yours

P. Dawn Mills, PhD

Principal Investigator:
Dr. P. Dawn Mills
Department of Mining Engineering
Norman B Keevil Institute of Mining Engineering

Co-Investigator:
N. Azaria Botta
Graduate Student – Master of Applied Science
Department of Mining Engineering
Norman B Keevil Institute of Mining Engineering

Confidentiality: The interview will be recorded in order be able to capture as much information as possible. The recording will be transcribed and a code will be assigned to the transcribed interview. The recording will be stored on a CD in a locked cabinet and the original will be erased from the hard-drive. The recording of the interview will not be used for any secondary research project.

Official Letter of Introduction

NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING
at the UNIVERSITY OF BRITISH COLUMBIA

Principal Investigator:
Dr. P. Dawn Mills
Norman B Keevil Institute of Mining Engineering
6350 Stores Road, Main Office: Room 517
Vancouver, BC
BC V6T 1Z4

Co-Investigator:
N. Azaria Botta
Graduate Student – Master of Applied Science
Department of Mining Engineering
Norman B Keevil Institute of Mining Engineering

To whom it may concern,

We would like to invite you to participate in a study about education and training opportunities in NE BC. The overall objective of the study is to produce an analysis of labour projections and broader community requirements to engage with the Liquid Natural Gas development in NE British Columbia. The study will identify opportunities to increase the labour pool by identifying what resources are currently in place and assess their ability to meet and deliver programs that support specific skills development at all phases from grade 10 - 12 to apprentice and/or colleague/university/certificate training programs. We are inviting persons associated with Human Resources and Recruitment industries associated with the Oil and Gas Sector potential post-secondary school needs within the next five years.

The interview will take approximately 45 minutes to an hour and will involve answering questions about views and opinions regarding educational preparedness for upcoming High School Graduates to avail themselves in a variety of Post-secondary opportunities, such as: training and apprenticeship programs that are offered throughout the Province and especially in Northeastern BC.

Your confidentiality will be respected. Information that discloses your identity will not be released, nor will your name be released in any reports, papers or thesis. Our interviews will be recorded, however the transcribed interviews will be encoded to ensure confidentiality, and the results of the study will be reported in a Master of Applied Science thesis.

We consider this research to be low risk, however, one of the potential risk may be in that the results of the study will not be followed up on.

1/2 Version 2

NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING
at the UNIVERSITY OF BRITISH COLUMBIA

I will be contacting you shortly to set up an interview at your convenience.

If you have any questions you may contact the Principal Investigator, Dr. P. Dawn Mills, Norman B Keevil Mining Engineering, Ema[redacted]

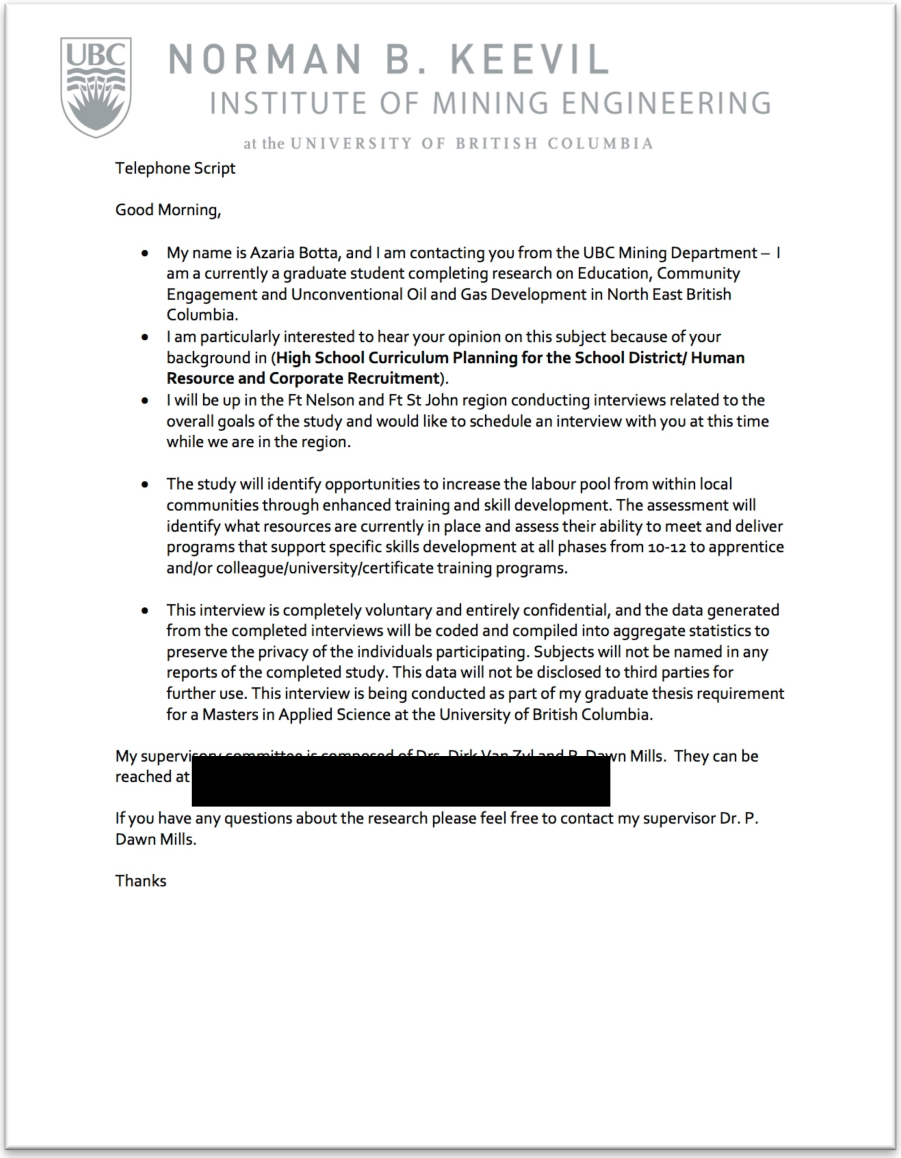
If you have concerns about the study or your rights to confidentiality, you can contact:
UBC Behavioral Research Ethics Office
#102, Technology Enterprise Facility III
6190 Agronomy Road
Vancouver, BC V6T 1Z3
Fax:[redacted]

Yours,

P. Dawn Mills, PhD

2/2 Version 2

Telephone Script



NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING
at the UNIVERSITY OF BRITISH COLUMBIA

Telephone Script

Good Morning,

- My name is Azaria Botta, and I am contacting you from the UBC Mining Department – I am a currently a graduate student completing research on Education, Community Engagement and Unconventional Oil and Gas Development in North East British Columbia.
- I am particularly interested to hear your opinion on this subject because of your background in (**High School Curriculum Planning for the School District/ Human Resource and Corporate Recruitment**).
- I will be up in the Ft Nelson and Ft St John region conducting interviews related to the overall goals of the study and would like to schedule an interview with you at this time while we are in the region.

- The study will identify opportunities to increase the labour pool from within local communities through enhanced training and skill development. The assessment will identify what resources are currently in place and assess their ability to meet and deliver programs that support specific skills development at all phases from 10-12 to apprentice and/or colleague/university/certificate training programs.

- This interview is completely voluntary and entirely confidential, and the data generated from the completed interviews will be coded and compiled into aggregate statistics to preserve the privacy of the individuals participating. Subjects will not be named in any reports of the completed study. This data will not be disclosed to third parties for further use. This interview is being conducted as part of my graduate thesis requirement for a Masters in Applied Science at the University of British Columbia.

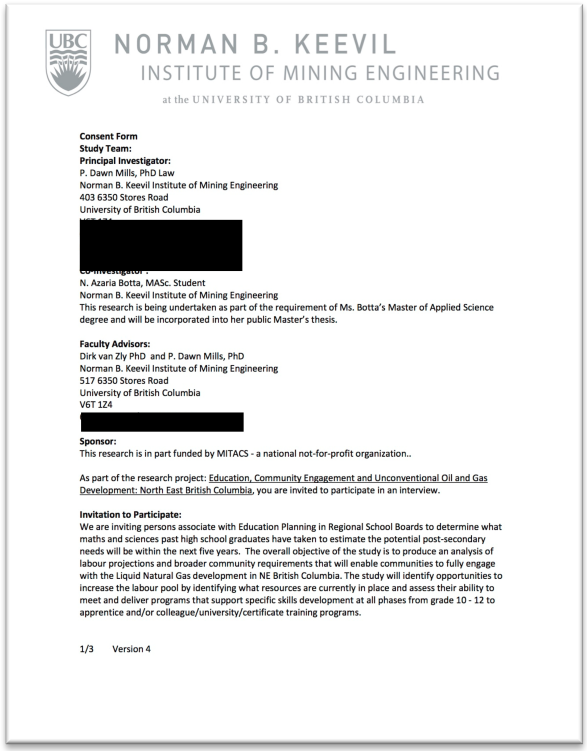
My supervisory committee is composed of Drs. Dirk Van Zyl and P. Dawn Mills. They can be reached at [redacted]

If you have any questions about the research please feel free to contact my supervisor Dr. P. Dawn Mills.

Thanks

Interview Consent Forms

School Boards, Chamber of Commerce and Municipal Government



NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING
at the UNIVERSITY OF BRITISH COLUMBIA

Consent Form
Study Team:
Principal Investigator:
P. Dawn Mills, PhD Law
Norman B. Keevil Institute of Mining Engineering
403 6350 Stores Road
University of British Columbia
[redacted]

Co-Investigator:
N. Azaria Botta, MASc. Student
Norman B. Keevil Institute of Mining Engineering
This research is being undertaken as part of the requirement of Ms. Botta's Master of Applied Science degree and will be incorporated into her public Master's thesis.

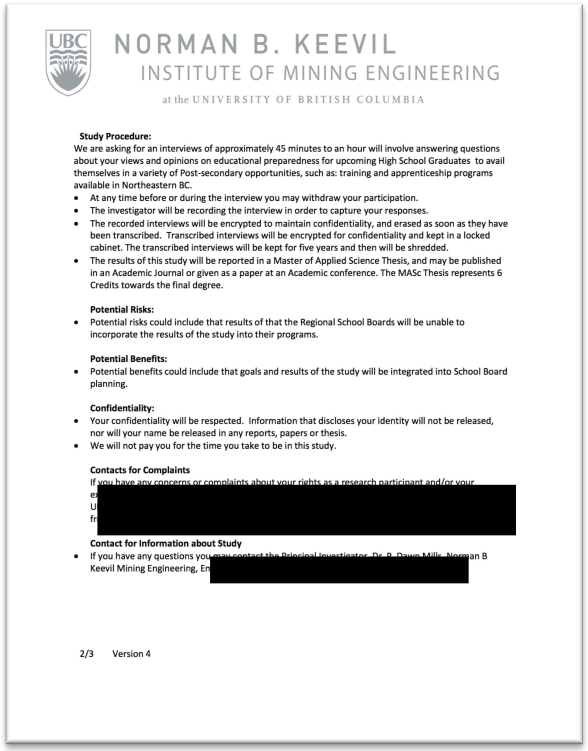
Faculty Advisors:
Dirk van Zly PhD and P. Dawn Mills, PhD
Norman B. Keevil Institute of Mining Engineering
517 6350 Stores Road
University of British Columbia
V6T 1Z4
[redacted]

Sponsor:
This research is in part funded by MITACS - a national not-for-profit organization..

As part of the research project: Education, Community Engagement and Unconventional Oil and Gas Development: North East British Columbia, you are invited to participate in an interview.

Invitation to Participate:
We are inviting persons associate with Education Planning in Regional School Boards to determine what maths and sciences past high school graduates have taken to estimate the potential post-secondary needs will be within the next five years. The overall objective of the study is to produce an analysis of labour projections and broader community requirements that will enable communities to fully engage with the Liquid Natural Gas development in NE British Columbia. The study will identify opportunities to increase the labour pool by identifying what resources are currently in place and assess their ability to meet and deliver programs that support specific skills development at all phases from grade 10 - 12 to apprentice and/or colleague/university/certificate training programs.

1/3 Version 4



NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING
at the UNIVERSITY OF BRITISH COLUMBIA

Study Procedure:
We are asking for an interviews of approximately 45 minutes to an hour will involve answering questions about your views and opinions on educational preparedness for upcoming High School Graduates to avail themselves in a variety of Post-secondary opportunities, such as: training and apprenticeship programs available in Northeastern BC.

- At any time before or during the interview you may withdraw your participation.
- The investigator will be recording the interview in order to capture your responses.
- The recorded interviews will be encrypted to maintain confidentiality, and erased as soon as they have been transcribed. Transcribed interviews will be encrypted for confidentiality and kept in a locked cabinet. The transcribed interviews will be kept for five years and then will be shredded.
- The results of this study will be reported in a Master of Applied Science Thesis, and may be published in an Academic Journal or given as a paper at an Academic conference. The MASc Thesis represents 6 Credits towards the final degree.

Potential Risks:
- Potential risks could include that results of that the Regional School Boards will be unable to incorporate the results of the study into their programs.

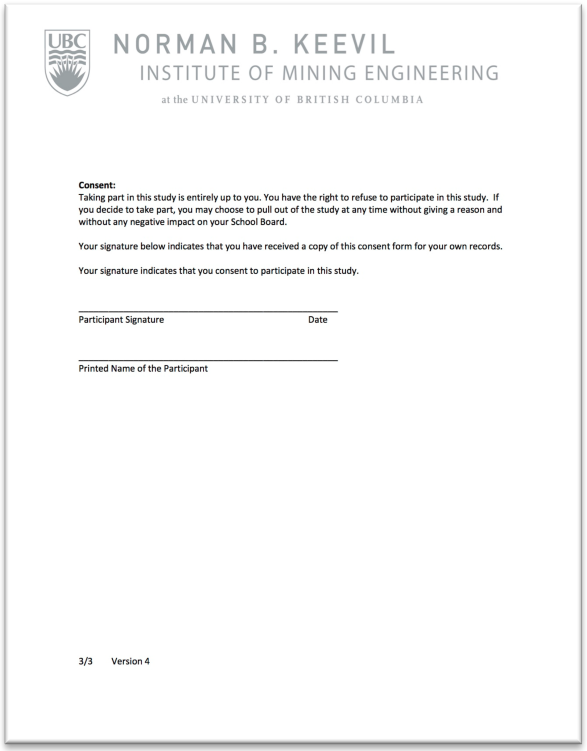
Potential Benefits:
- Potential benefits could include that goals and results of the study will be integrated into School Board planning.

Confidentiality:
- Your confidentiality will be respected. Information that discloses your identity will not be released, nor will your name be released in any reports, papers or thesis.
- We will not pay you for the time you take to be in this study.

Contacts for Complaints
If you have any concerns or complaints about your rights as a research participant and/or your ex
U
fr
[redacted]

Contact for Information about Study
- If you have any questions you may contact the Principal Investigator, Dr. P. Dawn Mills, Norman B Keevil Mining Engineering, En
[redacted]

2/3 Version 4



NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING
at the UNIVERSITY OF BRITISH COLUMBIA

Consent:
Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. If you decide to take part, you may choose to pull out of the study at any time without giving a reason and without any negative impact on your School Board.

Your signature below indicates that you have received a copy of this consent form for your own records.

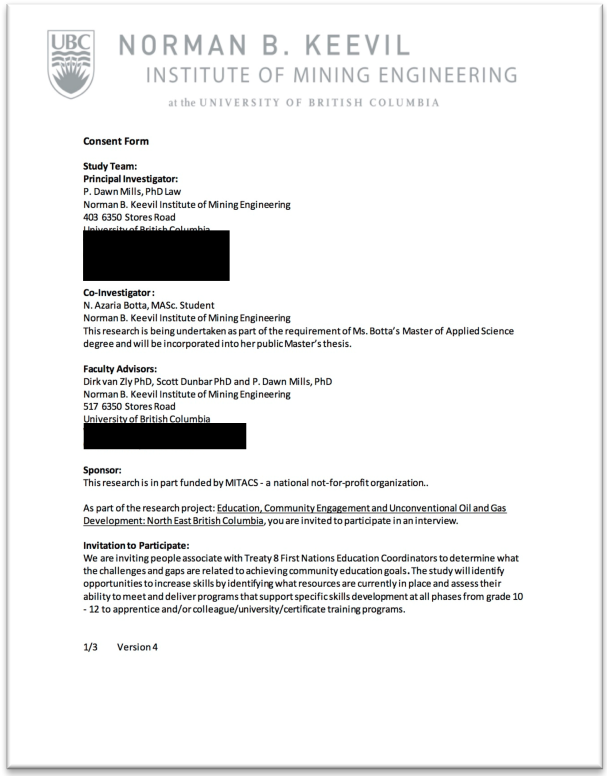
Your signature indicates that you consent to participate in this study.

_____
Participant Signature Date

_____
Printed Name of the Participant

3/3 Version 4

Band Education Coordinators



NORMAN B. KEEVIL
INSTITUTE OF MINING ENGINEERING
at the UNIVERSITY OF BRITISH COLUMBIA

Consent Form

Study Team:
Principal Investigator:
P. Dawn Mills, PhD Law
Norman B. Keevil Institute of Mining Engineering
403 6350 Stores Road
University of British Columbia
[redacted]

Co-Investigator:
N. Azaria Botta, MASc. Student
Norman B. Keevil Institute of Mining Engineering
This research is being undertaken as part of the requirement of Ms. Botta's Master of Applied Science degree and will be incorporated into her public Master's thesis.

Faculty Advisors:
Dirk van Zly PhD, Scott Dunbar PhD and P. Dawn Mills, PhD
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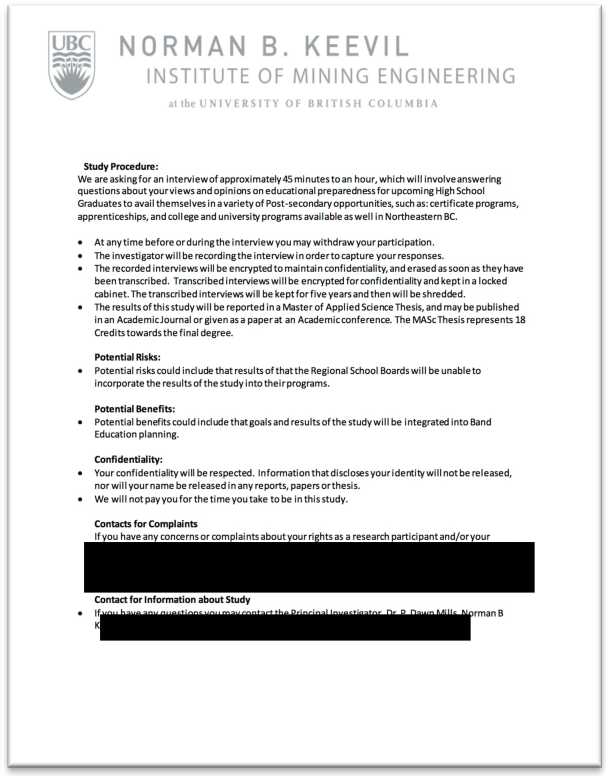
[redacted]

Sponsor:
This research is in part funded by MITACS - a national not-for-profit organization..

As part of the research project: Education, Community Engagement and Unconventional Oil and Gas Development: North East British Columbia, you are invited to participate in an interview.

Invitation to Participate:
We are inviting people associate with Treaty 8 First Nations Education Coordinators to determine what the challenges and gaps are related to achieving community education goals. The study will identify opportunities to increase skills by identifying what resources are currently in place and assess their ability to meet and deliver programs that support specific skills development at all phases from grade 10 - 12 to apprentice and/or colleague/university/certificate training programs.

1/3 Version 4



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at the UNIVERSITY OF BRITISH COLUMBIA

Study Procedure:
We are asking for an interview of approximately 45 minutes to an hour, which will involve answering questions about your views and opinions on educational preparedness for upcoming High School Graduates to avail themselves in a variety of Post-secondary opportunities, such as: certificate programs, apprenticeships, and college and university programs available as well in Northeastern BC.

- At any time before or during the interview you may withdraw your participation.
- The investigator will be recording the interview in order to capture your responses.
- The recorded interviews will be encrypted to maintain confidentiality, and erased as soon as they have been transcribed. Transcribed interviews will be encrypted for confidentiality and kept in a locked cabinet. The transcribed interviews will be kept for five years and then will be shredded.
- The results of this study will be reported in a Master of Applied Science Thesis, and may be published in an Academic Journal or given as a paper at an Academic conference. The MASc Thesis represents 18 Credits towards the final degree.

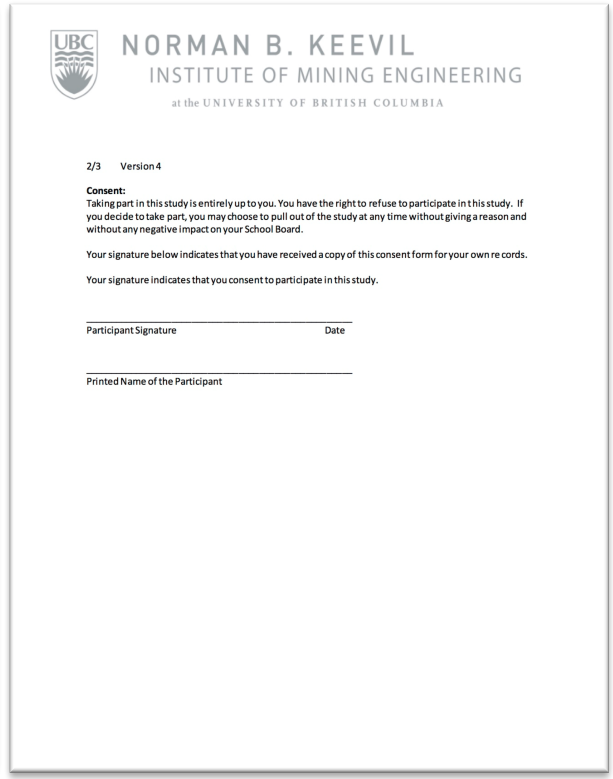
Potential Risks:
- Potential risks could include that results of that the Regional School Boards will be unable to incorporate the results of the study into their programs.

Potential Benefits:
- Potential benefits could include that goals and results of the study will be integrated into Band Education planning.

Confidentiality:
- Your confidentiality will be respected. Information that discloses your identity will not be released, nor will your name be released in any reports, papers or thesis.
- We will not pay you for the time you take to be in this study.

Contacts for Complaints
If you have any concerns or complaints about your rights as a research participant and/or your
[redacted]

Contact for Information about Study
- If you have any questions you may contact the Principal Investigator, Dr. P. Dawn Mills, Norman B K[redacted]



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2/3 Version 4

Consent:
Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. If you decide to take part, you may choose to pull out of the study at any time without giving a reason and without any negative impact on your School Board.

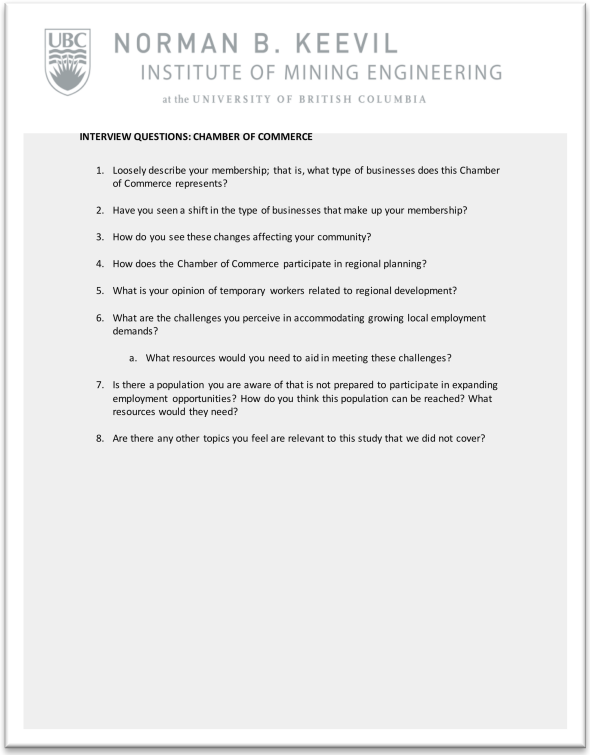
Your signature below indicates that you have received a copy of this consent form for your own re cords.

Your signature indicates that you consent to participate in this study.

_____
Participant Signature Date

_____
Printed Name of the Participant

Interview Questions



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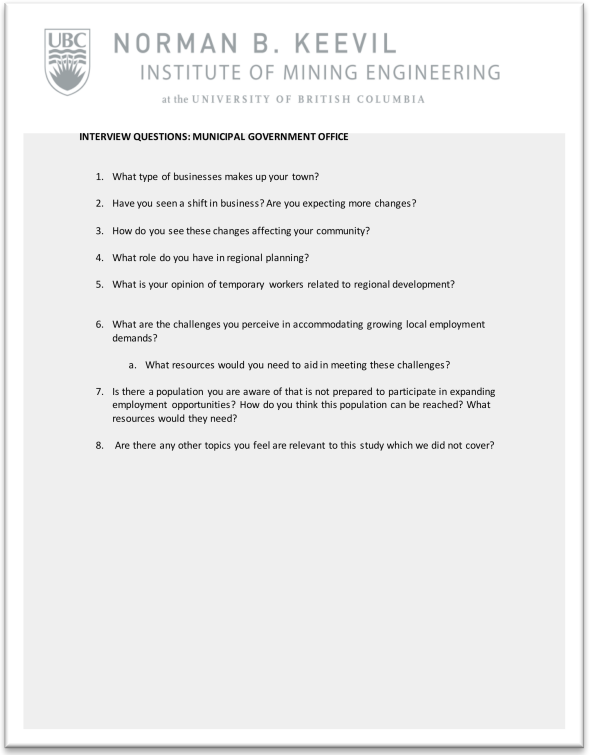
INTERVIEW QUESTIONS: CHAMBER OF COMMERCE

1. Loosely describe your membership; that is, what type of businesses does this Chamber of Commerce represents?
2. Have you seen a shift in the type of businesses that make up your membership?
3. How do you see these changes affecting your community?
4. How does the Chamber of Commerce participate in regional planning?
5. What is your opinion of temporary workers related to regional development?
6. What are the challenges you perceive in accommodating growing local employment demands?
    a. What resources would you need to aid in meeting these challenges?
7. Is there a population you are aware of that is not prepared to participate in expanding employment opportunities? How do you think this population can be reached? What resources would they need?
8. Are there any other topics you feel are relevant to this study that we did not cover?



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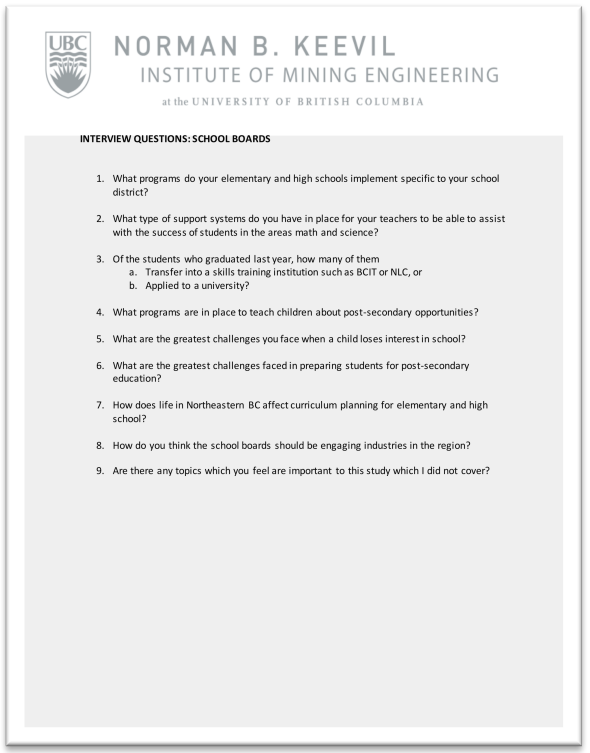
INTERVIEW QUESTIONS: MUNICIPAL GOVERNMENT OFFICE

1. What type of businesses makes up your town?
2. Have you seen a shift in business? Are you expecting more changes?
3. How do you see these changes affecting your community?
4. What role do you have in regional planning?
5. What is your opinion of temporary workers related to regional development?
6. What are the challenges you perceive in accommodating growing local employment demands?
    a. What resources would you need to aid in meeting these challenges?
7. Is there a population you are aware of that is not prepared to participate in expanding employment opportunities? How do you think this population can be reached? What resources would they need?
8. Are there any other topics you feel are relevant to this study which we did not cover?



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INTERVIEW QUESTIONS: SCHOOL BOARDS

1. What programs do your elementary and high schools implement specific to your school district?
2. What type of support systems do you have in place for your teachers to be able to assist with the success of students in the areas math and science?
3. Of the students who graduated last year, how many of them
    a. Transfer into a skills training institution such as BCIT or NLC, or
    b. Applied to a university?
4. What programs are in place to teach children about post-secondary opportunities?
5. What are the greatest challenges you face when a child loses interest in school?
6. What are the greatest challenges faced in preparing students for post-secondary education?
7. How does life in Northeastern BC affect curriculum planning for elementary and high school?
8. How do you think the school boards should be engaging industries in the region?
9. Are there any topics which you feel are important to this study which I did not cover?

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INTERVIEW QUESTIONS: POST-SECONDARY EDUCATION INSTITUTIONS

1. How many new get accepted each term/year?
   a. What are the accurate minimum qualifications for entry?
   b. Is there competition for seats?
2. Of these students how many are;
   a. Post-Secondary students vs. continuing education students?
   b. From Northeastern BC, compared to the rest of Canada and other countries?
3. Do you have any preferred student placements?
4. What are your graduation or program completion rates?
5. What programs are unique to your campus and why?
6. Do you provide any job or apprenticeship placements for you students? If so, how are they set up?
7. Do you offer life-skills programs for at risk students?
8. Are you able to develop outreach programs for different regions of BC? If so, how is this achieved and are they successful?
9. What kind of relationship does your school have to local industries: oil and gas, unconventional oil and gas, mining, hydroelectric, forestry and agriculture?
10. Do you plan your curriculum based on local employment opportunities? If so, how?
1. Are there any topics which you feel are important to this study which I did not cover?

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INTERVIEW QUESTIONS: BAND EDUCATION COORDINATORS & INDIGENOUS EDUCATION PROGRAM ADMISTRATORS

1. What programs do your elementary and high schools implement specific to your community/School?
2. In general, how interested are the students in math and science?
3. What type of support systems do you have in place for your teachers/students to be able to assist in the education of math and science based courses?
4. How is the completion rate of high school students in your community?
5. Of the students who graduated last year, how many of them
   a. Transfer into a skills training institution such as BCIT or NLC, or
   b. Apply to a university?
6. What programs are in place to teach children about post-secondary opportunities?
7. How does life in your Community effect curriculum planning for elementary and high school?
8. What are the greatest challenges you face when a child loses interest in school?
9. What are the greatest challenges faced in preparing students for post-secondary education?
10. How do you think your community should be engaging industry in relation to education?
11. Are there any topics which you feel are important to this study which I did not cover?

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INTERVIEW QUESTIONS: COMMUNITY EDUCATION ORGANIZATIONS

1. Loosely describe your membership.

2. What type of direct services do you provide?

3. How do you provide educational information to your members?

4. What type of education information is most useful to your members, trades or access to upgrading for university or college?

5. What are the most common hurdles your members experience in achieving their education goals?

6. Are there any additional services that you would like to provide? If so what resources would you need?

7. Given the projection of the recent LNG ramp-up, how are you preparing your members to engage in it?
   What challenges do you face with these plans?

8. Are there any other topics you feel are relevant to this study which we did not cover?

Appendix B: Community Engagement and Interview Schedule

COMMUNITY ENGAGEMENT & INTERVIEWS, DECEMBER 2014 – JULY 17, 2015			
Date	Location	Interviews	Events
December 2, 2014	Dawson Creek	District Chamber of Commerce – Executive Director	
December 2, 2014	Dawson Creek	Northern Lights College – Dean of Continuing Education, International Education and Workforce Training	
December 3, 2014	Chetwynd	Chetwynd Chamber of Commerce – Executive Director	
December 3, 2014	Chetwynd	Chetwynd Chamber of Commerce – Director	
December 3, 2014	Chetwynd	District of Chetwynd – Councilor	
December 3, 2014	Chetwynd	Saulteau First Nation – Education Coordinator	
December 4, 2014	Hudson's Hope	Hudson's Hope Municipal Office – Chief Administrator Officer	
December 4, 2014	Fort St John	Fort Saint John Chamber of Commerce – Executive Director	
December 11, 2014	Calgary		Calfrac Well Services Ltd –

			Director of Industry and Government Relations
February 10, 2015	Fort St John	North Eastern Native Advancing Society - Employment Assistance Services Coordinator	
February 11, 2015	Dawson Creek	School District 59 – District Principal	
February 13, 2015	Fort St John	School District 60 – Superintendent	
February 13, 2015	Fort St John	School District 60 - District Principal of International Education	
February 13, 2015	Dawson Creek	School District 59 – Director of Instruction Aboriginal Education	
February 14, 2015	Fort St John	Mayor of Dawson Creek	
February 17-18, 2015	West Moberly Lake First Nation		Homestay
February 19, 2015	Fort St John		Treaty 8 Chiefs and Tribal Council
February 20, 2015	Fort Nelson	School District 81– Superintendent of Schools	
February 20, 2015	Fort Nelson	Fort Nelson Chamber of Commerce – Director, Fort Nelson Employment Services	

February 20-21, 2015	Fort Nelson First Nation		Homestay
February 22-24, 2015	Liard Territory		Homestay/Hunting Expedition
March 10, 2015	Fort St John	West Moberly First Nation – Education Coordinator	
March 10, 2015	Fort St John	Saulteau First Nations – Education Coordinator	
March 11, 2015	Fort St John		Meeting regarding Fort St John Hospital – First Nation Art Installation
March 12, 2015	Fort St John		Tour of Fort St John High School and Trades Training Programs
March 12, 2015	Fort St John		Treaty 8 Tribal Association Education and Industry Show
March 12, 2015	Fort St John	Aboriginal Education Centre School District 60 – District Vice Principal	
March 12, 2015	Vancouver		Panel Discussion on the Tsilhqot'in case

April 15, 2015	Fort Nelson First Nation	Fort Nelson First Nation – Youth Outreach Executive Director	
April 15, 2015	Fort Nelson First Nation	Fort Nelson First Nation – Youth Outreach Coordinator	
April 15, 2015	Fort Nelson First Nation		Attend community lead course on moose hide skinning and tanning
April 16, 2015	Fort Nelson First Nation	Chalo School – Cultural Teacher	
April 16, 2015	Fort Nelson First Nation	Chalo School - Trades Programs Coordinator	
April 16, 2015	Fort Nelson First Nation	Fort Nelson First Nation – Education Coordinator	
April 21, 2015	Blueberry River First Nation	Blueberry River First Nation – Education Coordinator	
April 21, 2015	Blueberry River First Nation		Tour Blueberry River Elementary School
April 22, 2015	Halfway River First Nation	Halfway River First Nations – Education Coordinator	
July 6, 2015	Calgary		Presentation of research findings to Calfrac Ltd

July 17, 2015	Calgary		Presentation of research findings to Progress Energy

Appendix C: Post-Secondary Education Programs at NLC and Prerequisites

SCHOOL	PROGRAM	REQUIREMENTS	NO OF STUDENTS	DURATION	FEE	INDUSTRY	
Northern Lights College (Dawson Creek Campus)	Carpentry – Apprenticeship	Level 1 :Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4 Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	Six weeks per level (4 Levels)	$678.99/Level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Carpentry Foundation Level 1 (Enhanced)	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	600 hrs + 18.5 hours safety courses (20 weeks)	$2,074.73 (plus safety courses, approx. $418)	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Carpentry Foundation Level 2 (Enhanced)	Successful completion of Carpentry Foundation Level 1 (Enhanced) program at NLC.	N/A	360 hrs (12 weeks)	$1,270.81	Construction + Services	
Northern Lights College (Fort St. John Campus)	Automotive Service Technician – Foundation	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	640 hrs + 3.5 hrs safety course (21 weeks)	$2,319.29 (plus safety course, approx. $30)	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Automotive Service Technician Foundation Trades Trai	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	960 hrs (37 weeks)	$3,330.38	Construction + Services	
Northern Lights College (Fort St. John Campus)	Automotive Service Technician – Apprenticeship	Level 1 :Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4 Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	Levels 1 and 3, seven weeks/level; Levels 2 and 4, six weeks/level	Level 1 $771.34, Level 2 $714.33, Level 3 $771.34, Level 4 $670.42	Construction + Services	
Northern Lights College	Business Management Certificate	Provide British Columbia secondary school transcripts or equivalent or post-secondary transcripts indicating successful completion of the following: Grade 12 English, or English Literature 12, or English 12 First Peoples, or Career and College Preparation ENGL050 (Provincial/Grade 12), or ENGL099: Foundational Writing, with a B or higher; OR Any university-level English course with a C or higher. AND Grade 11 Math (Principles, or Foundations, or Pre-Calculus), or Career and College Preparation MATH040 (Advanced/Grade 11).	N/A	450 hrs (30 weeks)	$3,001.50	Construction + Services	
Northern Lights College (Fort St. John Campus)	Electrician Apprenticeship	Successful completion of the NLC Business Management Certificate or course equivalents. Successful completion of one of the following: Grade 11 Math (Pre-Calculus), or Grade 12 Math (Principles, or Foundations), or Career and College Preparation MATH050 (Provincial/Grade 12), or MATH108, or MGMT111.	N/A	10 weeks per level	$1,088.03/level	Construction + Services	
Northern Lights College (Fort St. John Campus)	Electrician Foundation Trades Training	Grade 11 level that includes: Grade 11 English, or Career and College Preparation ENGL040 (Advanced/Grade 11); Grade 11 Math (Pre-Calculus, or Applications, or Principles), or Career and College Preparation MATH040 (Advanced/Grade 11); and Grade 11 Physics (or equivalent), all with 67 per cent (C+) or higher Complete the following sections of the Canadian Adult Achievement Test (CAAT): Reading Comprehension: 12.0 grade equivalent or higher Number Operations: 11.0 grade equivalent or higher Problem Solving: 11.0 grade equivalent or higher Mechanical Reasoning: 51/70 (6th Stanine) or higher Trades Math Assessment: 70 per cent or higher Dual Credit Grade 11 level completion that includes Grade 11 English, Grade 11 Math (Pre-Calculus), and Grade 11 Physics (or equivalent), all with 67 per cent (C+) or higher.	N/A	630 hrs + 17.5 hrs safety courses (21 weeks)	$2,382.40 (plus safety courses, approx. $321)	Construction + Services	
Northern Lights College (Fort St. John Campus)	Heavy Duty Equipment Technician – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Successful completion of Module 1 program/examination; Completion of Module 1 exemption form by employer. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	6 weeks per level/4 Levels	$678.99/level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Heavy Mechanical Trades – Foundation/Level 1	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	1260 hrs (41 weeks)	$4200.38	Construction + Services	
Northern Lights College (Fort St. John Campus)	Industrial Instrumentation Mechanic – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	300 hrs 10 weeks/ 4 levels	$1,130.87/level	Construction + Services	

SCHOOL	PROGRAM	REQUIREMENTS	NO OF STUDENTS	DURATION	FEE	INDUSTRY	
Northern Lights College (Fort St. John Campus)	Industrial Instrumentation Mechanic – Foundation	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	630 hrs (21 weeks)	$2382.40	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Millwright (Industrial Mechanic) – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	7 weeks per level/ 4 levels	$784.19/level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Millwright (Industrial Mechanic) Foundation Level 1 (Enhanced)	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	390 hrs (13 weeks)	$1358.86	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Millwright (Industrial Mechanic) Foundation Level 2 (Enhanced)	Successful completion of Millwright Foundation Level 1 (Enhanced) program at NLC.	N/A	210 hrs (7 weeks)	$696.76	Construction + Services	
Northern Lights College (Fort St. John Campus)	Oil and Gas Field Operations	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	493 hrs + 67 hrs safety courses (18 weeks)	$3,364.55 (plus safety courses, approx. $1,704)	Oil and Gas Industry	
Northern Lights College (Dawson Creek Campus)	Plumber – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4 :Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	180 hrs (6 weeks)/ 4 level	$678.99/level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Plumber Foundation Level 1 (Enhanced)	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	420 hrs (14 weeks)	$1,458.30	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Plumber Foundation Level 2 (Enhanced)	Successful completion of Plumbing Foundation Level 1 (Enhanced) program at NLC.	N/A	180 hrs (6 weeks)	$597.19		
Northern Lights College (Fort St. John Campus)	Power Engineering and Gas Processing	Grade 11 level that includes: Grade 11 English or Career and College Preparation ENGL040 (Advanced/Grade 11); Grade 11 Math (Applications, or Principles, or Pre-Calculus) or Career and College Preparation MATH040 (Advanced/Grade 11); and Grade 11 Physics or equivalent all with 67 per cent (C+) or higher. Complete the following sections of the Canadian Adult Achievement Test (CAAT): Reading Comprehension: 12.0 grade equivalent or higher Number Operations: 11.0 grade equivalent or higher Problem Solving: 11.0 grade equivalent or higher Mechanical Reasoning: 51/70 (6th Stanine) or higher Complete the Basic Math and Physical Sciences: Problems and Solutions Workbook prior to the start of classes. Students will be tested within the first week of classes. Dual Credit Grade 11 level completion that includes Grade 11 English, Grade 11 Math (Pre-Calculus), and Grade 11 Physics (or equivalent), all with 67 per cent (C+) or higher. AND Complete the Basic Math and Physical Sciences: Problems and Solutions Workbook prior to the start	N/A	1,200 hrs +74 hrs safety courses (39 weeks)	$4,851.05 (plus safety courses, approx. $1,262)		
Northern Lights College (Dawson Creek Campus)	Welding Foundation Trades Training	(C+) or higher; • Grade 10 Math (Apprenticeship and Workplace; or Applications; or Principles), or Career and College Preparation MATH030 (Intermedi~ate/Grade 10), with 67 per cent (C+) or higher; OR Complete the following sections of the Canadian Adult Achievement Test (CAAT): • Reading Comprehension: 10.0 grade equivalent or higher • Number Operations: 10.0 grade equivalent or higher • Problem Solving: 10.0 grade equivalent or higher • Mechanical Reasoning: 51/70 (6th Stanine) or higher Submit a Prior Learning Package including resume and supporting documents to demonstrate skills and work experience. Dual Credit Grade 10 level completion that includes Grade 10 English and Grade 10 Math (Apprenticeship and Workplace), both with 67 per cent (C+) or higher.	N/A	840 hrs	$3,123.75		
Northern Lights College (Dawson Creek Campus)	Welding – Apprenticeship	Employer-sponsored ITA registered Apprentice	N/A	240 hrs (8 weeks)/ level (3 Levels)	$869.05/level		
Northern Lights College (Fort St. John Campus)	Industrial Instrumentation Mechanic – Apprenticeship	Proof of successful completion of related Foundation Trades Training program. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	300 hrs 10 weeks/ 4 levels	$1,130.87/level	Construction + Services	

SCHOOL	PROGRAM	REQUIREMENTS	NO OF STUDENTS	DURATION	FEE	INDUSTRY	
Northern Lights College (Dawson Creek Campus)	Carpentry – Apprenticeship	Level 1 :Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4 Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	Six weeks per level (4 Levels)	$678.99/Level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Carpentry Foundation Level 1 (Enhanced)	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	600 hrs + 18.5 hours safety courses (20 weeks)	$2,074.73 (plus safety courses, approx. $418)	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Carpentry Foundation Level 2 (Enhanced)	Successful completion of Carpentry Foundation Level 1 (Enhanced) program at NLC.	N/A	360 hrs (12 weeks)	$1,270.81	Construction + Services	
Northern Lights College (Fort St. John Campus)	Automotive Service Technician – Foundation	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	640 hrs + 3.5 hrs safety course (21 weeks)	$2,319.29 (plus safety course, approx. $30)	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Automotive Service Technician Foundation Trades Trai	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	960 hrs (37 weeks)	$3,330.38	Construction + Services	
Northern Lights College (Fort St. John Campus)	Automotive Service Technician – Apprenticeship	Level 1 :Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4 Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	Levels 1 and 3, seven weeks/level; Levels 2 and 4, six weeks/level	Level 1 $771.34, Level 2 $714.33, Level 3 $771.34, Level 4 $670.42	Construction + Services	
Northern Lights College	Business Management Certificate	Provide British Columbia secondary school transcripts or equivalent or post-secondary transcripts indicating successful completion of the following: Grade 12 English, or English Literature 12, or English 12 First Peoples, or Career and College Preparation ENGL050 (Provincial/Grade 12), or ENGL099: Foundational Writing, with a B or higher; OR Any university-level English course with a C or higher. AND Grade 11 Math (Principles, or Foundations, or Pre-Calculus), or Career and College Preparation MATH040 (Advanced/Grade 11).	N/A	450 hrs (30 weeks)	$3,001.50	Construction + Services	
Northern Lights College (Fort St. John Campus)	Electrician Apprenticeship	Successful completion of the NLC Business Management Certificate or course equivalents. Successful completion of one of the following: Grade 11 Math (Pre-Calculus), or Grade 12 Math (Principles, or Foundations), or Career and College Preparation MATH050 (Provincial/Grade 12), or MATH108, or MGMT111.	N/A	10 weeks per level	$1,088.03/level	Construction + Services	
Northern Lights College (Fort St. John Campus)	Electrician Foundation Trades Training	Grade 11 level that includes: Grade 11 English, or Career and College Preparation ENGL040 (Advanced/Grade 11); Grade 11 Math (Pre-Calculus, or Applications, or Principles), or Career and College Preparation MATH040 (Advanced/Grade 11); and Grade 11 Physics (or equivalent), all with 67 per cent (C+) or higher Complete the following sections of the Canadian Adult Achievement Test (CAAT): Reading Comprehension: 12.0 grade equivalent or higher Number Operations: 11.0 grade equivalent or higher Problem Solving: 11.0 grade equivalent or higher Mechanical Reasoning: 51/70 (6th Stanine) or higher Trades Math Assessment: 70 per cent or higher Dual Credit Grade 11 level completion that includes Grade 11 English, Grade 11 Math (Pre-Calculus), and Grade 11 Physics (or equivalent), all with 67 per cent (C+) or higher.	N/A	630 hrs + 17.5 hrs safety courses (21 weeks)	$2,382.40 (plus safety courses, approx. $321)	Construction + Services	
Northern Lights College (Fort St. John Campus)	Heavy Duty Equipment Technician – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Successful completion of Module 1 program/examination; Completion of Module 1 exemption form by employer. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	6 weeks per level/4 Levels	$678.99/level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Heavy Mechanical Trades – Foundation/Level 1	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	1260 hrs (41 weeks)	$4200.38	Construction + Services	
Northern Lights College (Fort St. John Campus)	Industrial Instrumentation Mechanic – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	300 hrs 10 weeks/ 4 levels	$1,130.87/level	Construction + Services	

SCHOOL	PROGRAM	REQUIREMENTS	NO OF STUDENTS	DURATION	FEE	INDUSTRY	
Northern Lights College (Fort St. John Campus)	Industrial Instrumentation Mechanic – Foundation	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	630 hrs (21 weeks)	$2382.40	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Millwright (Industrial Mechanic) – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	7 weeks per level/ 4 levels	$784.19/level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Millwright (Industrial Mechanic) Foundation Level 1 (Enhanced)	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	390 hrs (13 weeks)	$1358.86	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Millwright (Industrial Mechanic) Foundation Level 2 (Enhanced)	Successful completion of Millwright Foundation Level 1 (Enhanced) program at NLC.	N/A	210 hrs (7 weeks)	$696.76	Construction + Services	
Northern Lights College (Fort St. John Campus)	Oil and Gas Field Operations	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	493 hrs + 67 hrs safety courses (18 weeks)	$3,364.55 (plus safety courses, approx. $1,704)	Oil and Gas Industry	
Northern Lights College (Dawson Creek Campus)	Plumber – Apprenticeship	Level 1: Registered Apprentice with the Industry Training Authority; Proof of successful completion of related Foundation Trades Training program. Levels 2-4 :Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	180 hrs (6 weeks)/ 4 level	$678.99/level	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Plumber Foundation Level 1 (Enhanced)	Provide British Columbia secondary school transcripts or equivalent indicating successful completion of Grade 10 level that includes: Complete the following sections of the Canadian Adult Achievement Test (CAAT) Grade 10 level completion that includes Grade 10 English; and Grade 10 Math (Apprenticeship and Workplace), with 67 per cent (C+) or higher in both.	N/A	420 hrs (14 weeks)	$1,458.30	Construction + Services	
Northern Lights College (Dawson Creek Campus)	Plumber Foundation Level 2 (Enhanced)	Successful completion of Plumbing Foundation Level 1 (Enhanced) program at NLC.	N/A	180 hrs (6 weeks)	$597.19		
Northern Lights College (Fort St. John Campus)	Power Engineering and Gas Processing	Grade 11 level that includes: Grade 11 English or Career and College Preparation ENGL040 (Advanced/Grade 11); Grade 11 Math (Applications, or Principles, or Pre-Calculus) or Career and College Preparation MATH040 (Advanced/Grade 11); and Grade 11 Physics or equivalent all with 67 per cent (C+) or higher. Complete the following sections of the Canadian Adult Achievement Test (CAAT): Reading Comprehension: 12.0 grade equivalent or higher Number Operations: 11.0 grade equivalent or higher Problem Solving: 11.0 grade equivalent or higher Mechanical Reasoning: 51/70 (6th Stanine) or higher Complete the Basic Math and Physical Sciences: Problems and Solutions Workbook prior to the start of classes. Students will be tested within the first week of classes. Dual Credit Grade 11 level completion that includes Grade 11 English, Grade 11 Math (Pre-Calculus), and Grade 11 Physics (or equivalent), all with 67 per cent (C+) or higher. AND Complete the Basic Math and Physical Sciences: Problems and Solutions Workbook prior to the start	N/A	1,200 hrs +74 hrs safety courses (39 weeks)	$4,851.05 (plus safety courses, approx. $1,262)		
Northern Lights College (Dawson Creek Campus)	Welding Foundation Trades Training	(C+) or higher; • Grade 10 Math (Apprenticeship and Workplace; or Applications; or Principles), or Career and College Preparation MATH030 (Intermedi~ate/Grade 10), with 67 per cent (C+) or higher; OR Complete the following sections of the Canadian Adult Achievement Test (CAAT): • Reading Comprehension: 10.0 grade equivalent or higher • Number Operations: 10.0 grade equivalent or higher • Problem Solving: 10.0 grade equivalent or higher • Mechanical Reasoning: 51/70 (6th Stanine) or higher Submit a Prior Learning Package including resume and supporting documents to demonstrate skills and work experience. Dual Credit Grade 10 level completion that includes Grade 10 English and Grade 10 Math (Apprenticeship and Workplace), both with 67 per cent (C+) or higher.	N/A	840 hrs	$3,123.75		
Northern Lights College (Dawson Creek Campus)	Welding – Apprenticeship	Employer-sponsored ITA registered Apprentice	N/A	240 hrs (8 weeks)/ level (3 Levels)	$869.05/level		
Northern Lights College (Fort St. John Campus)	Industrial Instrumentation Mechanic – Apprenticeship	Proof of successful completion of related Foundation Trades Training program. Levels 2-4: Successful completion of previous level Apprenticeship Technical Training; Successful challenge of previous level Industry Training Authority Placement Exam.	N/A	300 hrs 10 weeks/ 4 levels	$1,130.87/level	Construction + Services	

Appendix D: Calculating School Capacity

Seats and Education Stages

Town/Community	School Name	Grades	Seat Number	Primary School K-4 (ages 5-9)	Middle School 5-9 (ages 10-14)	Secondary School 10-12 (ages 15-17)	Post-Secondary School (18-24)
Fort Nelson	**Fort Nelson Secondary**	8-12	299		120	179	
Fort Nelson	**G W Carlson Elementary**	K-4	187	187			
Fort Nelson	**J S Clark Elementary**	K-4	118	118			
Fort Nelson	**R L Angus Elementary**	5-7	154		154		
Fort Nelson	**Toad River Elem-Secondary**	2-9	10	4	6		
Fort Nelson	**Northern Lights College - Fort Nelson**						175
TOTAL				**309**	**280**	**179**	**175**
Fort Nelson First Nation	**Chalo School**	K-12	187	**72**	**72**	**43**	
Fort St John	**Alwin Holland Elementary**	K-6	358	256	102		
Fort St John	**Bert Ambrose**	K-6	325	232	93		
Fort St John	**Bert Bowes Middle School**	7-9	493		493		
Fort St John	**C M Finch Elementary**	K-6	293	209	84		
Fort St John	**Christian Life School**	K-12	215	83	83	50	
Fort St John	**Clearview Elem-Jr Secondary**	K-10	168	76	76	15	
Fort St John	**Dr Kearney Middle School**	7-9	501		501		
Fort St John	**Duncan Cran Elementary**	K-6	296	211	85		
Fort St John	**Ecole Central Elem School of the Arts**	K-6	360	257	103		
Fort St John	**Energetic Learning Campus**	10-11	232			232	
Fort St John	**Key Learning Centre**	8-10	7		5	2	
Fort St John	**North Peace Secondary**	10-12	939			939	
Fort St John	**Northern BC Distance Ed School**	K-12	801	308	308	185	
Fort St John	**Upper Pine Elem-Jr Secondary**	K-8	193	121	72		

Town/Community	School Name	Grades	Seat Number	Primary School K-4 (ages 5-9)	Middle School 5-9 (ages 10-14)	Secondary School 10-12 (ages 15-17)	Post-Secondary School (18-24)
Fort St John	**Robert Ogilvie Elementary**	K-6	317	226	91		
Fort St John	**Northern Lights College - Fort St John**						1800
TOTAL				**1979**	**2096**	**1423**	**1800**
Hudson's Hope	**Hudson's Hope School**	K-12	127	**49**	**49**	**29**	**175**
Buick	**Buick Creek Elementary**	K-7	25	**18**	**7**		
Baldonnel	**Baldonnel Elementary**	K-6	127	**91**	**36**		
Halfway River First Nation	**Upper Halfway Elem**	K-7	39	**24**	**15**		
Taylor	**Taylor Elementary**	K-6	159	**114**	**45**		
Prespatou	**Prespatou Elem-Secondary**	K-12	326	**125**	**125**	**75**	
Charlie Lake	**Charlie Lake Elementary**	K-6	379	**271**	**108**		
Dawson Creek	**Canalta Elementary**	K-7	219	137	82		
Dawson Creek	**Crescent Park Elementary**	K-7	205	128	77		
Dawson Creek	**Dawson Creek Secondary**	8-12	961		384	577	
Dawson Creek	**Devereaux Elementary**	K-7	91	57	34		
Dawson Creek	**Ecole Frank Ross Elementary**	K-7	436	273	164		
Dawson Creek	**Mountain Christian School**	K-12	165	63	63	38	
Dawson Creek	**Notre Dame**	K-7	228	143	86		
Dawson Creek	**Peace View School**	K-12	143	55	55	33	
Dawson Creek	**Ron Pettigrew Christian School**	K-12	145	56	56	33	
Dawson Creek	**South Peace Alternate**	9-12	22		6	17	
Dawson Creek	**South Peace Distributed Learning**	12	5			5	
Dawson Creek	**South Peace Elementary**	1-9	22	10	12		
Dawson Creek	**Tremblay Elementary**	K-7	166	104	62		
Dawson Creek	**Northern Lights College - Dawson Creek**						1300
TOTAL				**1026**	**1081**	**703**	**1300**

Town/Community	School Name	Grades	Seat Number	Primary School K-4 (ages 5-9)	Middle School 5-9 (ages 10-14)	Secondary School 10-12 (ages 15-17)	Post-Secondary School (18-24)
Chetwynd	**Chetwynd Secondary**	8-12	299		120	179	
Chetwynd	**Don Titus Montessori**	K-7	74	46	28		
Chetwynd	**Little Prairie Elementary**	K-12	162	62	62	37	
Chetwynd	**Peace Christian School**	K-12	143	55	55	33	
Chetwynd	**Windrem Elementary**	K-7	145	91	54		
Chetwynd	**Northern Lights College - Chetwynd**						175
TOTAL				**254**	**319**	**249**	**175**
West Moberly Lake First Nation	**Moberly Lake Elementary**	K-7	51	**32**	**19**		
Groundbirch	**McLeod Elementary Secondary**	K-12	57	**22**	**22**	**13**	
Farmington	**Parkland Elementary**	K-7	54	**34**	**20**		
Pouce Coup	**Pouce Coupe Elementary**	K-7	88	**55**	**33**		
Rolla	**Rolla Discovery School**	K-7	31	**19**	**12**		

Available Seats and Student Population Size at Each Education Stage

Primary School Grades K-4 (ages 5-12) - 5.4% of Population							
Communities and Towns	Total Population	Student Population	Seats	Drive < 10 min (1.00)	Drive < 30 min (0.75)	Drive < 60 min (0.25)	Capacity
Fort Nelson (FN)	4514	244	309(65)	309 + FNFN (53)= 362/244 = 1.48	0	0	1.48
Fort Nelson First Nation (FNFN)	359	19	72(53)	72 + FN (65) =137/19 = 7.21	0	0	7.21
Prophet River First Nation (PRFN)	129	7	0	0	0	0	0
Halfway River First Nation (HRFN)	170	9	24	24/9=2.67	0	0	2.67
Blueberry River First Nation (BRFN)	185	10	15(5)	15/10= 1.5	*Buick* (18) X (0.75)=13.5/10= 1.35	*Prespatou* (110) X (0.25) = 27.50/10 = 2.75	5.6
Doig River First Nation (DRFN)	124	7	0	0	0	FSJ (1039) + Charlie Lake (149) X (0.25) = 297/7 = 42.43	42.43
Fort St John (FSJ)	17400	940	1979(1039)	1979/940 = 2.11	*Charlie Lake* (149) + *Baldington* (91)+ *Taylor*(39) = 279 X (0.75) = 209.25/940 = 0.22	Farmington (34) + DC (432) = 466 X (0.25) = 150.5/940 = 0.16	2.49
Hudson's Hope (HH)	1012	55	49(-6)	55(-6) = 49/55=0.89	WMFN (29) X(0.75)=21.75	CHTWND (112)X(.25)=28	1.80
West Moberly Lake First Nation (WBFN)	51	3	32 (29)	32/3=10.67	HH = 0	CHTWND (112)X(.25)=28/3=9.33	20
Saulteau First Nation (SFN)	320	17	17	WMFN (29)/17=1.7	0	CHTWND (112)X(.25)=28/17=1.65	3.35
Dawson Creek (DC)	10994	594	1026(432)	1026/594=1.73	Groundbirch (22) + Farmington (34) + Pouce Coup (15) +Rolla (19) = 90 X (0.75) = 67.5 /594=0.113	Taylor (39) + FSJ (1039) + Baldington (91) = 1169 X (0.25) = 292.25/594=0.49	2.34
Chetwynd (CHTWD)	2633	142	254 (112)	254/142=1.79	0	WMFN (29) X(.25) = 7.25=0.05	1.84
Groundbirch	n/a	n/a	22				
Farmington	n/a	n/a	34				
Pouce Coup	739	40	55(15)				
Rolla	n/a	n/a	19				

	Middle School Grades5-9 (ages 10-14) - 5.2% of Population						
	Total Population	Student Population	Seats	Drive < 10 min (1.00)	Drive < 30 min (0.75)	Drive < 60 min (0.25)	Capacity
Fort Nelson (FN)	4514	235	280(45)	280 + FNFN(53)	0	0	1.42
Fort Nelson First Nation (FNFN)	359	19	72 (53)	72 + FN (45)	0	0	6.16
Prophet River First Nation (PRFN)	129	7	0	0	0	0	0
Halfway River First Nation (HRFN)	170	9	15(6)	15	0	0	1.5
Blueberry River First Nation (BRFN)	185	10	0	0	0	Prespatou (111)X0.25 = 27.75	2.78
Doig River First Nation (DRFN)	124	6	0	0	0	FSJ (1191) + Charlie Lake (108) X 0.25 = 324.75	54.13
Fort St John (FSJ)	17400	905	2096 (1191)	2096	0	DC (509) X 0.25 =127.25	2.46
Hudson's Hope (HH)	1012	53	49(-4)	45	SFN(16)X0.75= 12	CHTWND (182) X0.25=45.5	1.08
West Moberly Lake First Nation (WBFN)	51	3	0	SFN (17)		CHTWND (182) X0.25=45.5	20.83
Saulteau First Nation (SFN)	320	17	34(16)	34		CHTWND (182) X0.25=45.5	4.68
Dawson Creek (DC)	10994	572	1081(509)	1081	Ground birch (22) + Farmington (20) + Rolla (12) X 0.75 = 40.5	FSJ (1191) X 0.25 = 270.25	2.43
Chetwynd (CHTWD)	2633	137	319(182)	319		SFN (16) X0.25 = 4	2.36

	High School Grades 10-12 (ages 5-12) - 3.54 % of Population						
	Total Population	Student Population	Seats	Drive < 10 min (1.00)	Drive < 30 min (0.75)	Drive < 60 min (0.25)	Capacity
Fort Nelson (FN)	4514	160	179(19)	179 +FNFN (30)+ 209/160 = 1.31			1.31
Fort Nelson First Nation (FNFN)	359	13	43(30)	43 + FN (19) = 62/13=4.7			4.7
Prophet River First Nation (PRFN)	129	5	0(-5)	0	0	0	0
Halfway River First Nation (HRFN)	170	6	0(-6)	0	0	0	0
Blueberry River First Nation (BRFN)	185	7	0 (-7)	0	0	Prespatou (75) X 0.25 = 18.75/7=2.68	2.68
Doig River First Nation (DRFN)	124	4	0(-4)			FSJ (807) X 0.25 = 201.75/4=50.44	50.44
Fort St John (FSJ)	17400	616	1423 (807)	1423/616=2.31		DC (314) X (0.25) =78.5/616=0.13	2.44
Hudson's Hope (HH)	1012	36	29(-7)	29/36=0.8	0	0	0.8
West Moberly Lake First Nation (WBFN)	51	2	0(-2)	0	HH = 0	CHTWND(156)X(0.25)=39/2=19.5	19.5
Saulteau First Nation (SFN)	320	11	0(-11)	0	0	39/11=	3.55
Dawson Creek (DC)	10994	389	703(314)	703/389=1.81	0	FSJ (201.75)/389=0.52	2.33
Chetwynd (CHTWD)	2633	93	249(156)	249/93=2.68	0	0	2.68

	Post-Secondary ages 18-24 - 9.26 % of Population						
	Total Population	Student Population	Seats	Drive < 10 min (1.00)	Drive < 30 min (0.75)	Drive < 60 min (0.25)	Capacity
Fort Nelson (FN)	4514	418	175	175 / [FN(418)+FNFN(33)} = 0.39			0.39
Fort Nelson First Nation (FNFN)	359	33	0	175 / [FN(418)+FNFN(33)} = 0.39			0.39
Prophet River First Nation (PRFN)	129	12	0				0
Halfway River First Nation (HRFN)	170	16	0				0
Blueberry River First Nation (BRFN)	185	17	0				0
Doig River First Nation (DRFN)	124	11	0			1800/[11+ FSJ (1611)] X (0.25)=0.28	0.28
Fort St John (FSJ)	17400	1611	1800	1800/1611=1.12		DC 1300X0.25=325/2629=0.12	1.24
Hudson's Hope (HH)	1012	94	175	175/94=1.86		CHTWND 175X(0.25)=43.75/338=0.13	1.99
West Moberly Lake First Nation (WBFN)	51	5	0		HH 175X(0.75)=131.25/99=1.33	CHTWND 175X(0.25)=43.75/249=0.176	1.5
Saulteau First Nation (SFN)	320	30	0			CHTWND 43.75/274=0.16 HH43.75/99=0.44	0.60
Dawson Creek (DC)	10994	1018	1300	1300/1018=1.28		FSJ 1800X0.25=450/2629=0.17	1.45
Chetwynd (CHTWD)	2633	244	175	175/244=0.72		HH = 0.13	0.85

Appendix E: Calfrac Aboriginal Engagement Initiative

Aboriginal Engagement Initiative

Background:

Calfrac and the University of British Columbia recently launched a Collaborative Research Initiative which has culminated in a report by Azaria Botta that identifies a number of education and training gaps in Northeastern British Columbia First Nation Communities. These gaps will impact the ability of the Liquefied Natural Gas industry to meet its future labour needs should the industry expand at projected levels. In addition, the report identifies key communities within Northeastern British Columbia which have limited access to or a shortage of resources that impact the educational and long term employment opportunities of community members.

Proposed Projects:

Upon review of the report, Calfrac has identified a specific need within these First Nation Communities that the Company believes it can help address through the application of its current training and development programs and a commitment of Company resources.

1. **A Driver's License and Training Program**

   The report states; *"One of the most talked about obstacles to education during this study was transportation. Graduated licensing is hard to achieve when you can't drive to the GMV. Onsite driving courses would go a long way!"* The program is particularly important to the First Nation Communities of Blueberry, Doig, West Moberly and Saulteau where access to schools is limited and high school completion rates are low. Calfrac has a well-developed driver training program and conducts these programs both internally and in conjunction with other third party providers to ensure that Calfrac operators are highly trained and skilled to perform their roles in a safe and effective manner. It is recommended that Calfrac engage in discussions with representatives and begin the process of working with these communities and local partners to provide onsite driver training and resources to allow residents to complete the driver examination process locally.

   Calfrac will:

   - Meet with local community leaders and training agencies to determine the specific scope of the project:
     - Identify the type of training required (Class 5, Class 1, other);
     - Target audience (minimum age 18, if enrolled in school full time minimum age 16)
     - Training location (Aboriginal communities, Non-Aboriginal Centre's)
     - Required resources to deliver the program (instructors, facilities, equipment, etc.)

    - Timelines and frequency of program delivery.
- Establish program costs and commit Company funding and determine if other government related funding programs are available in support;
- Establish the program evaluation criteria;
- Work with Calfrac's Canadian Human Resources team, local community leaders and agencies to link the training programs with long term employment with Calfrac. (Operator in Training and Calfrac Employee Responsibility Training)

2. Sponsorship of a PIMS Workshop for teachers in the communities

The Pacific Institute for the Mathematical Sciences (PIMS) was created in 1996 by the community of mathematical scientists in Alberta and British Columbia, and subsequently extended to both Washington State and Saskatchewan. It's mandate is to promote research in and applications of the mathematical sciences, to facilitate the training of highly qualified personnel, to enrich public awareness of and education in the mathematical sciences, and to create mathematical partnerships with similar organizations in other countries (with a particular focus on the Pacific Rim). PIMS funds Collaborative Research Groups, Post-Doctoral Fellowships and individual events on a competitive basis. Calfrac has been working with PIMS since 2012 and the research project has identified a specific need for teacher workshops and upgrading in the Northeastern BC communities.

Calfrac will Engage PIMS and the School Districts 59, 60 & 81 to determine the resources required, timing, location and content of workshops to be offered to teachers in the local communities to support enhanced mathematics education.

3. Provide industry specific training and upgrading for math skills

The report identified opportunities for industry and education to work together to address continuing education needs for northern residents. The need to upgrade skills and education is hampered by a lack of equipment and teachers. Calfrac has developed industry specific math training programs which could be offered online through North Eastern Native Advancing Society (NENAS) to help address the need for skills upgrading and continuing education.

Calfrac will engage NENAS to provide the necessary resources to allow access to Calfrac developed courses including math upgrading and the operator training programs.

Appendix F: Personal Account of My Experiences with Community Engagement

Personal Experience

I knew from my studies in community planning and First Nations studies that it would be inappropriate to involve myself in a research study involving communities with which I was not familiar. One of the first things they teach in Planning is to never plan for a community you have not visited. Cold-call phone interviews were a possibility, but they were not an option. To build a relationship with the town/community and the people you may be affecting it is important to visit, take the time to explore local shops, talk to strangers and get a real sense of the culture. Take in the lay of the land and create an inner map of your surroundings. I was told later on during my homestay that this exercise of creating personal geographic icons is called "local knowledge."

For my methodology I used directed interviews and focus groups to acquire important information from local experts on education programs, obstacles to education, employment opportunities and community development. I found that the face-to-face element of in person interview was essential. Once my interview participants felt comfortable, the level of openness and emotion in their responses would double. Furthermore, passionate remarks and ideas would jump out regardless of the questions themselves. I was surprised by how my own personal expectations from an individual and how I believed they would respond to aspects of the interview questions were often not what I expected. These experiences further strengthened my ability to leave judgments and personal opinions aside when interacting with the interviewees. Every person I spoke to was an expert, in their own way, on the subject of labour shortages and expanding industry. I walked away from every interview satiated with information, and exhausted.

Setting up the interviews and focus groups with the local chamber of commerce, municipal offices and education institutions was challenging but straightforward. Figuring out an appropriate way to establish a relationship within the First Nation communities in the region was more complex, due to the formalities of visiting reserves and the atmosphere of "consultation-fatigue." Elders and Band members are constantly approached by outsiders, expecting them to

donate their time and knowledge, without proper introduction or a follow-up on how their information was used.

I was very fortunate that an acquaintance of mine from UBC who is Dane-Zaa was coincidentally visiting my professor's office while I was working out the logistics of my next field trip to NEBC. Serendipitously, he traveling to Fort St John the following week to visit his family and offered to introduce me to his family in West Moberly Lake and Fort Nelson First Nation. As I was leaving the office, he yelled after me, "pack warm gear, we're going hunting" and I booked my flight as soon I was home.

I was picked up at the airport and immediately gifted a small hunting knife and lighter, with an ominous warning, "you always have to be prepared in the North." We headed into town to buy groceries for his Grandma, who we were staying with— "You never arrive empty handed" – he remarked while picking out kale and potatoes.

As we drove into West Moberly, my guide explained that he would show me his territory and introduce me to his relatives, "as a guest and not a researcher." I took this to heart, and in addition to my one professional duty to present my research to the Treaty 8 Chiefs and Tribal Council, resolved to remove my academic hat and immersed myself in the experience of being a guest.

Grandma's house has a revolving door of visiting sons, daughters, grandkids, neighbors and friends. My guide dutifully helped his grandmother around the house, and listened carefully to any stories she told. He told me to always listen when she was talking, and I did. We stayed up late the first night sitting next to the fire. She told countless tales, some magical, some historical and some about her experiences working in the bush. She was a strong woman, who continued to stake out sensitive habitats and culturally significant areas for industry to avoid.

The better part of the next day was dedicated to learning how to safely use a few different rifles, shooting practice and other hunting tips. In the evening we helped Grandma make moose stew followed with dry meat and moose grease snacks.

We discussed our plans to go hunting with Grandma and she warned us about the wolves. She explained that there was an imbalance in the food chain: ungulates were under threat from habitat loss, exposure to predators from cut blocks, hunting and road accidents. Furthermore, wolves were on the rise because of easy prey in deforested areas. However, because of depleting game the wolves have now been roaming closer to human settlement and preying on livestock and were especially aggressive. Due to these combining factors, there was a cull on wolves with a bounty of a $1000 a head. Grandma told her grandson not to be afraid to kill them, despite their beauty, because it was their purpose as Dane to keep the balance, and the wolves were killing too many caribou and moose.

The following day we headed back to Fort St John for the Treaty 8 Chiefs and Tribal Council meeting. Although it is not necessary to acquire a formal invitation to visit the reserves, it is highly recommended, and I was excited for the prospect of their blessing. The meeting was not as I expected. Everyone was very familiar with one another and the atmosphere was relaxed. My presentation was well received and a few members asked questions or spoke to the research and its relevance. After lunch at the Treaty 8 Tribal Council office, we drove to Fort Nelson First Nation to stay with the other set of grandparents.

Like the first house, their home was a constant buzz of people coming and leaving. We met up with an uncle and his wife who were leading a youth camp up the trap line to learn hunting and winter survival skills. They explained how they became involved in the youth outreach program and their investment in teaching the kids traditional land use. I exchanged information with the couple, and contacted them a month later for an interview.

As the sun was setting I took part in a moose-skinning lesson taught by the local elementary school cultural teacher. Along with Elders, children and community members interested in learning how to make moose hide, I worked to prepare moose pelt for leather in moccasins and other effects. We used bone knives cut from the shins of a female moose (cow); I was told that cows that have born calves had stronger shinbones from carrying the weight of their babies. I could barely sleep that night, knowing that the next day we were snowshoeing into the bush to hunt. I finally felt ready.

Snowshoeing into the Liard was spectacular. From a good vantage point we could almost see 360 degrees around. My guide could tell a story about every mountain, gully, lake and river in sight, although he was careful not to tell me too many, "because it is Dane-Zaa medicine (magic), not to be shared frivolously". It was then that it struck me how the landscape stretched around us was his territory, his family's territory, his people's territory. The Beaver people have been living around the Peace River for centuries, "since the world began", and I could truly see that he belonged there. It dawned on me how a people can evolve with a landscape, shape it as it shapes their identity. In that instance there was no separation between him and the expanse of wilderness outstretched before us. I had never seen or felt anything like it, and I knew then why he had taken the time to show me. He wanted me to understand their perspective, and feel the connection they had to their land, to see it, experience it, if even for a moment.

My own genealogy as a Canadian, cut off from my ancestral roots in Europe and limited by my relatively small family could never fully grasp the interwoven ties these people had to their land. I don't presume to understand it fully now with my short glimpse through this young man's eyes. I am however forever grateful for the experience.

On our hike back we saw a pack of wolves, four white females and a black alpha male. We prepared the rifles and took aim, watching them run in formation through our crosshairs. It felt wrong to hunt the sleek pack, despite the cull, and we slowing dismantled the guns in silent contemplation. With a serious expression my guide taught me the most important lesson in hunting, "better to regret the shot you did not take than the one you did," because a maimed animal escaping will likely die tortured, a tragically wasteful affair.

We saw the pack again as we neared the truck, distantly aware of our presence.

Reflections

The environment shapes Northern culture, whether you speak to townspeople or First Nations, endurance against the elements and dependence on local resources has molded their reality. This survival mentality fosters strong community elements, where family and solid relationships are

regarded as the true testament of sustainability. This element of trust and friendship was most prevalent during my homestay, where I was invited into the fold of two families and treated with care and respect, with the understanding that the notion would be reciprocated. In return for the generous act of inviting me to partake in their culture, I will tell my story of the magic and significance of my experience, with the hope that it helps others better understand their perspective on current socio-economic events in NEBC.

Most of the traditional activities I partook in revolved around food, hunting, cooking and eating. Hunting, as I learned, is no easy task, especially with dwindling moose and caribou populations. A moose will feed a family over the winter and the preparation and use of every part of the animal is standard. This has been facilitated by the use of freezers, however the painstaking process of making dry meat continues to be an important custom. Families take great pride in providing for guests, and the culture of hosting is strong. As a guest it is important not to show up empty handed; a thoughtful gift shows a level of respect and gratitude for the generosity bestowed. While western living has affected food security, in that grocery stores are now the main source of sustenance, the engrained respect for how much energy goes into providing food remains an important deep seeded aspect of the culture.

Respect for food ties directly to respect for nature, where spirits, benevolent and cruel, reside. Acting as a steward does not merely mean balancing the food chain for the Dena-Zaa; it requires maneuvering between more active natural forces, which I can only describe as personalities, and other-worldly. Only someone with the right sight and pre-disposed skills can work this nature to their advantage. While driving into the Liard, my guide would know ten minutes beforehand if we would see a moose up ahead, without tracks to follow, purely on instinct. It gave me a newfound admiration for the ability of an individual and a people to truly know their environment.

Oral history is how the vast amount of information about the land and resources has been passed down through the generations. While I had a glimpse of the power of this knowledge dissemination during my time with Grandma, I understood the necessity for the accounts to be paired with hands-on experience. My guide's uncle spoke passionately about the mutually

beneficial experience of teaching youth traditional skills on his reserve. A revitalized sense of cultural pride is awakening, after the years of cultural genocide and rippled after-affects.

While working to heal their self-identify and culture, these communities are struggling to become economic equals in the Canadian playing field. It is important to recognize that these criteria are not mutually exclusive. Building strong relationships and learning from local experts and traditional knowledge are crucial elements in the sustainable socio-economic development of Northern British Columbia.