EXPLORING WATER GOVERNANCE IN NORTHERN SASKATCHEWAN: OPPORTUNITIES FOR A WATERSHED COUNCIL

A Thesis Submitted to the
College of Graduate Studies and Research
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts
in the Department of Geography,
University of Saskatchewan
Saskatoon
Canada

By

NADINE RENÉE LEMOINE

PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a Postgraduate Degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work or, in their absence, by the Head of the Department or the Dean of the College in which my thesis work was done. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis. Requests for permission to copy or to make other use of material in this thesis in whole or part should be addressed to:

Head of the Department of Geography and Planning

University of Saskatchewan

Saskatoon, Saskatchewan

S7N 5C8

ABSTRACT

Currently the Saskatchewan Watershed Authority (SWA) leads much of the planning and management of the province's water resources with the goal to ensure access to safe drinking water sources and reliable water supplies. The SWA has developed detailed planning initiatives across the more populated southern portion of the province. Meanwhile, in the north of the province where small and predominantly Indigenous communities exist, there is a conspicuous absence of watershed planning. This condition is increasingly problematic given prolonged problems with local drinking water quality, renewed interest in northern resource development, legacy mining climate change impacts, and jurisdictional fragmentation between federal, provincial, and inter-provincial agencies. During the Keepers of the Water (IV) conference in Wollaston Lake 2010, a resolution passed stating the need for the creation of a Northern Saskatchewan Watershed Council that would include northern watershed sub-basins. The objectives of this research examine opportunities for such a council and how it might be governed and interfaced with other existing governance structures across the north of this province. Semi-structured interviews with key northern stakeholders were used as a primary method of data collection. The overall analysis is based on these semi-structured interviews and their relationship to current literary discourses on watershed governance, Indigenous water governance, watershed councils and capacity building.

The central findings of this research demonstrate that the current Saskatchewan watershed governance framework is not effective in addressing northerners' water quality and quantity and watershed governance concerns. The primary challenges to effective watershed governance for northern Saskatchewan include insufficient dialogue between northern stakeholders, inadequate Treaty representation and inconsistencies with regulations and guidelines. The participants interviewed in this study have indicated overwhelming interest in the creation of a northern Saskatchewan watershed council as a mechanism for greater northern dialogue on water related issues and concerns. This research will contribute to the understanding of northern Saskatchewan watershed governance.

ACKNOWLEDGEMENTS

I would like to extend my most sincere gratitude to Dr. Robert Patrick for his guidance, support, positive reinforcement and patience throughout the completion of this thesis. Robert Patrick's supervision and encouragements contributed to a wonderful experience both in the academic and research process and in my life in Saskatoon for the past two years. I would also like to thank the direction provided by thesis committee, Dr. Ryan Walker, Dr. David Natcher and, Dr. Ryan Brook. Additionally, I would like to thank the academic community and support staff at the University of Saskatchewan's Department of Geography and Planning for their constant reinforcement.

I would also like to thank all my research participants, notably the community of Hatchet Lake First Nation for welcoming me in their community with open arms. I would like to acknowledge the Canadian Pacific Partnership Program in Aboriginal Community Planning for providing me with financial support throughout my research and the Prince Albert Grand Council for additional insight, support and partnership.

Lastly I would like to thank my friends who have made my experience in Saskatoon and at the University of Saskatchewan a lively, enriching experience of which I will always relish. Most of all, I would like to thank my family: Raymond, Madeleine et Patrick – merci et je vous aime!

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVEATIONS

AANDC	Aboriginal Affairs and Northern Development Canada
BC	British Columbia
BWA	Boil Water Advisory
EA	Environmental Assessment
HC	Health Canada
NAD	Northern Administration District
NWT	Northwest Territories
OCAP	Ownership, Control, Access and Possession
OECD	Organization for Economic Co-operation and Development
PAGC	Prince Albert Grand Council
RBR	Results Based Regulation
SAW	Saskatchewan Associations of Watersheds
SEC	Saskatchewan Environmental Code
SWA	Saskatchewan Watershed Authority
TEK	Traditional Ecological Knowledge

CHAPTER 1
INTRODUCTION

Healthy watersheds are essential to maintain a functioning ecosystem and integral to support human wellness. Canada has an abundant supply of freshwater sources, holding approximately 7% of the global renewable freshwater supply (Environment Canada, 2012). Yet the current and future state of Canada's water quality and quantity is facing some serious challenges. From 1994 to 1999, more than 25% of Canadian municipalities experienced water shortages and out of the 34 Organization for Economic Co-operation and Development (OECD) countries, Canada remains the only nation that does not have legally enforceable federal drinking water standards (Environment Canada, 2008; Bakker, 2007i). As of April 2008, more than 1700 boil water advisories were in place for communities across the country (Phare, 2010).

As mentioned in a 2006 report by the Office of the Auditor General of Canada and the Commissioner of the Environment and Sustainable Development, the Canadian Constitution Act (1867) does not explicitly acknowledge the right to water. This issue has gained international attention as First Nations in Canada have encountered a growing number of water safety issues.

In 2008, there were 93 Boil Water Advisories (BWAs) in First Nations communities across Canada (Eggertson, 2008). As of April 30th, 2012 that number had grown to 122 (Health Canada, 2012). The Public Health Agency of Canada's report *Towards a Healthy Future: Second Report on the Health of Canadians* (1999) asserts that "the incidence of waterborne diseases is several times higher in First Nations communities than in the general population"; and the federal government actively lobbied against Resolution 64/292 (2010) on water as a human right brought forth by the UN General Assembly (Health Canada, 1999; Hunter, 2010). The

disparity between water quality on and off reserve in Canada has been criticized by the Royal Commission on Aboriginal Peoples (1994), the Auditor General of Canada (1995) and, the United Nations Committee on Economic, Social, and Cultural Rights (2006). A 2005 report by the Commissioner for Environment and Sustainable Development stated that "when it comes to the safety of drinking water, residents of First Nations communities do not benefit from a level of protection comparable with that of people living off reserves. This is partly because there are no laws and regulations governing the provision of drinking water in First Nations communities, unlike other communities" (Commissioner of the Environment and Sustainable Development; 2005). Many have already noted that these water quality and quantity issues can be directly attributed to the lack of robustness of Canada's legislative and governance framework (Auditor General of Canada, 2006; Boyd, 2011).

Water on First Nation land is regulated by the federal government where three departments share the primary responsibility for delivering safe drinking water to reserves: Aboriginal Affairs and Northern Development Canada (AANDC), Health Canada (HC), and Environment Canada. As a result, Canada's federal government's water governance framework is fragmented and faces a number of challenges such as lack of inter-governmental coordination, duplication of efforts, poor data collection and sharing and inadequate monitoring and enforcement (Bakker & Cook, 2011).

Fragmentation occurs where responsibility for water governance is allocated amongst multiple actors with little to no coordination and lack of clarity on the direction of final decisions (Bakker & Cook 2011). Bakker & Cook (2011) noted that this is a prevalent water governance issue at all scales of government in Canada; others have also concluded that watershed governance roles and responsibilities remain unclear within the Canadian context because a

number of key areas are not regulated by the current framework or are divided among too many stakeholders (Dhillon, 2010).

Watershed governance directs the decision making process which influences watershed planning (Bakker, 2007ii). In Saskatchewan, the Saskatchewan Watershed Authority (SWA) leads much of the watershed planning and management of the province's water resources with the goal to ensure access to safe drinking water sources and reliable water supplies (SWA, 2010). The SWA has developed detailed planning initiatives across the more populated southern portion of the province; as seen in the shaded areas in Figure 1. These initiatives include the administration and control of infrastructure, inventory maintenance of quality and quantity of ground and surface water, undertaking watershed studies and research, evaluations of the state of watershed resources in the province, and developing and implementing watershed protection plans through public consultation and in cooperation with local communities (SWA, 2010).

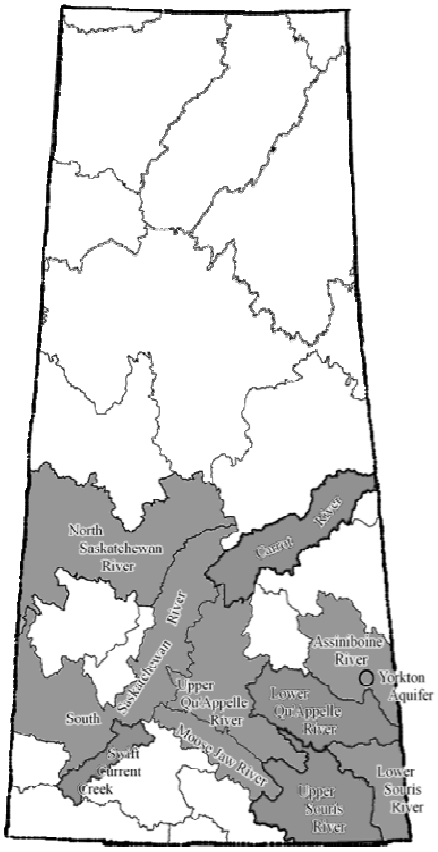

Figure 1: Source Water Protection Plans for Saskatchewan Watersheds, 2008 - *Adapted from: Saskatchewan Watershed Authority, (SWA, 2008), "Watershed and Aquifer Planning"; "Watershed and Aquifer Planning Map"*

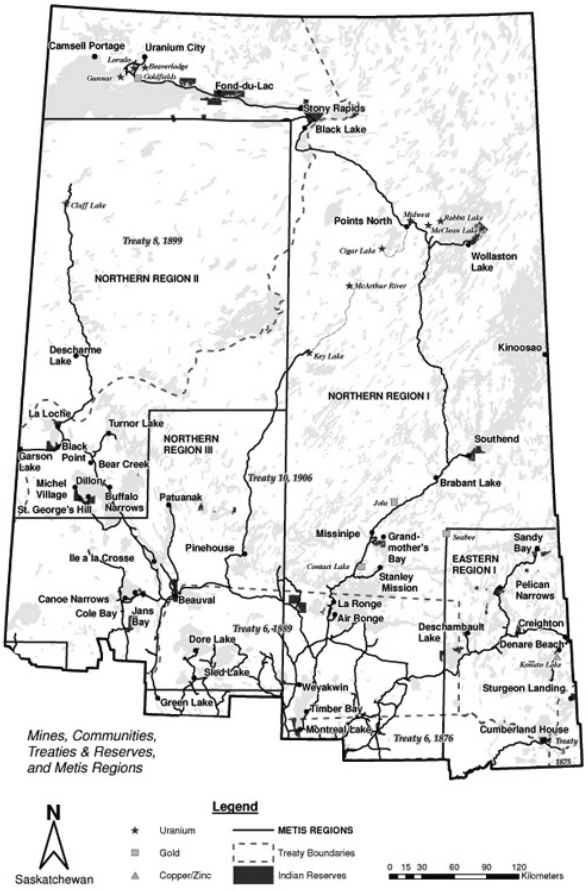

Figure 2: Map of the Northern Administration District of Saskatchewan (Government of Saskatchewan, 2009)

Figure 1 shows an absence of watershed planning in the north of the province where small and predominantly Indigenous communities exist. Currently there are more than 42,000 people living in northern Saskatchewan and according to Statistics Canada's 2006 census on Aboriginal Peoples, over 80% of this population have self-identified as Aboriginal (Statistics Canada, 2006). Northern Saskatchewan is defined as the area north of Prince Albert, and can be best represented through a map of the Northern Administration District (Figure 2).

The lack of watershed planning in this region raises concerns for the Indigenous population, given renewed interest in northern resource development, legacy mining, climate change impacts and, jurisdictional fragmentation between federal, provincial, and inter-provincial agencies (Harden & Levalliant, 2008).

1.2 Research Context

In 2006, a group of concerned northern residents gathered in Liidlii Kui, Denendeh/Fort Simpson in the Northwest Territories to discuss northern water issues, engendering the first "Keepers of the Water Gathering". The Keepers of the Water is a composition of stakeholders working together for the protection of air, water and land in the Arctic Drainage Basin. This group holds an annual meeting in a northern watershed and is comprised of First Nations, Métis, Inuit peoples, environmental groups, concerned citizens, governmental actors, academics and northern communities (Keepers of the Water, 2010).

At Keepers of the Water (IV) conference in Wollaston Lake 2010, a resolution was passed in support of a "Northern Saskatchewan Watershed Council". This resolution was supported by the Prince Albert Grand Council (PAGC) who, in late 2010 wrote a letter in support of a Northern Saskatchewan Watershed Council to the Government of Saskatchewan. This resolution suggested that a council would include the watershed sub-basins of the Athabasca/Slave Rivers, Churchill River, Beaver River, North Saskatchewan River Delta, Sturgeon Weir, Cree River, Clearwater River and, the Reindeer River (Wollaston Lake) (Keepers of the Water, 2010) (see Figure 3).

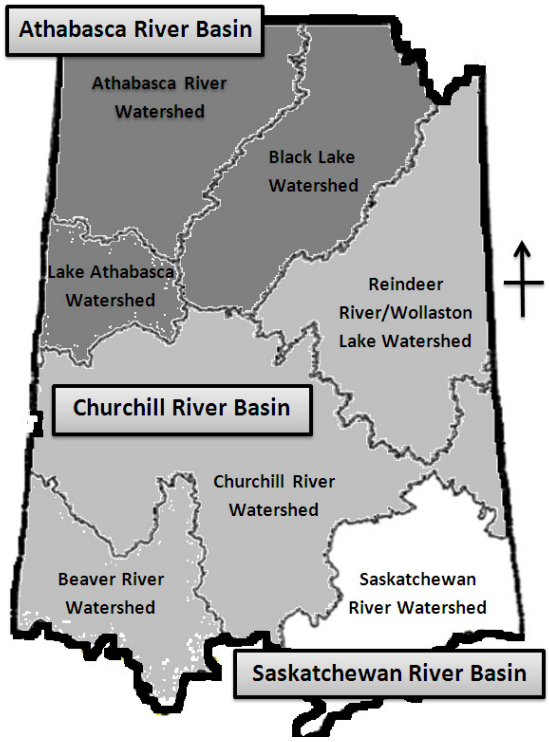

Figure 3: Proposed area for a Northern Saskatchewan Watershed Council *Adapted from: Saskatchewan Watershed Authority, (SWA, 2008)*

1.3 Goals & Objectives

The goal of this research is to identify the institutional arrangements and capacity-building requirements necessary to support watershed governance in northern Saskatchewan. More specifically, the objectives of this research are:

1. To describe the existing watershed governance structure in Saskatchewan;
2. To assess the level of support for a northern Saskatchewan Watershed Council; and,
3. To identify the capacity needs to support a northern Saskatchewan Watershed Council.

This thesis has been organized in seven chapters. The first chapter provides a general introduction to the project, including the research context and research goals and objectives. The second chapter discusses the major themes of this research while exposing discourses in the current literature. The third chapter highlights the methodology used in the research process. The fourth chapter demonstrates the overall results of the semi-structured interviews. Chapter five provides a discussion of the results and their relationship to both the academic literature and the research objectives. The sixth chapter offers final conclusions and recommendations from this research. A list of references used in this thesis can be found in the seventh chapter.

CHAPTER 2
LITTERATURE REVIEW

The following chapter provides a summary of the main themes fundamental to this research in the current literature. The central themes explored in this research are: water governance in Canada, Indigenous water governance, watershed councils & decentralized watershed governance and, capacity building.

2.1 Water Governance in Canada

The concept of "water governance" refers to the decision making process which influences the adoption of operational approaches to initiate "water management" (Bakker 2007ii). Both "water governance" and "water management" are interrelated but differ in that "governance" refers to the process in which decisions are made and who is involved in this decision rather than the models, principles and information used to make these decisions (Bakker 2007ii).

Water governance is characterized by "participation, transparency, equity, accountability, coherence, responsiveness, ethical choices, and integration of water decision making with other pertinent concerns" (de Loë *et al*., 2007: iii). It has been argued that issues in watershed planning are as much a problem of "governance" involving multiple networks of organizations, as a question of science and designing effective policies (Graham & Fortier, 2006). Thus, the preferred policy instruments and scales for implementation of governance will have important implications for the social and political interactions among watershed stakeholders and Indigenous communities (Ferreyra *et al.,* 2008).

Governance also differs from "government" because it involves other social decision makers, including members for industry, business and civil society (Brands, 2005). Good governance, following the benchmark principles of accountability, transparency, responsiveness, equity and inclusion, effectiveness and efficiency, following participatory, consensus-oriented decision making is imperative to achieving effective and efficient outcomes in watershed decision-making (World Resources Institute, 2003; Graham & Fortier, 2006).

Many elements of water governance are based on institutional arrangements that shape and dictate the level of capacity for watershed management (Ivey *et al*., 2006). Institutional arrangements represent the legislation, regulations, policies, and political and administrative structures that facilitate or limit specific activities (Ivey *et al*., 2006; Timmer *et al*., 2007; Patrick *et al*., 2008). Therefore, institutional arrangements include the policies, guidelines, regulations and legislation that influence a sector, such as resource management.

It has been shown that good watershed governance allows for enhanced sustainable use of water resources and ecosystem integrity (Miranda *et al*, 2011). Yet, solving Canada's ongoing and future water resource problems, such as governance and quantity and quality, will require accommodating various competing interests. Some have argued that a thorough examination of our current federal water governance structure needs to take place in order to solicit these interests (Bakker, 2007ii; Nowlan & Bakker, 2007; Armitage *et al*, 2009).

Bakker (2007ii: 3) notes that there is an absence of leadership for water governance at a national level, where there has been "a diminished (and in some instances ineffective) federal government focus on water issues over the past two decades". There are a total of 19 federal departments that exert some degree of involvement in the management of water resources; the

most important are Environment Canada, Health Canada, Natural Resources Canada, Fisheries and Oceans Canada and Agriculture and Agri-Food Canada (Hulbert *et al*, 2009). The spread of responsibility and competing mandates have been described as "massively horizontal" and often impedes on effective action (PRI, 2005:3). Brands (2005), notes that Canada's current water governance framework is in dire need of reform in order to deal with future water needs.

2.1.1 Water Governance in Saskatchewan

Water governance in Saskatchewan involves a number of actors including federal and provincial agencies, local governments, civil society groups and non-governmental organizations. The federal and provincial governments both have a say in the management of water resources in Saskatchewan; yet the provincial government takes a lead role in the management and regulation of water (Bakker, 2007ii). The key provincial actors include the Saskatchewan Watershed Authority, the Saskatchewan Ministry of the Environment, the Saskatchewan Ministry of Health and Regional Health Districts and other provincial ministries who have vested interest in water resources (such as SaskPower). Local and municipal governments play a role in providing safe municipal drinking water to residents and approving local development and land use activities. A variety of other stakeholders also take part in watershed governance in Saskatchewan, including NGOs, advocacy groups, academics, local citizen groups, industrial actors and other special interest groups (Hurlbert *et al* 2009).

A study by Hurlbert *et al* (2009:123) evaluated watershed governance in Saskatchewan through which an overwhelming number of their respondents agreed that the current water governance framework in Saskatchewan amounted to a "cluster of water governance organizations [which have] overlapping mandates, functions and linkages, leading to confusing and unclear mandates and communications chasms". Yet there have been some successes in

water governance in Saskatchewan over the years, which have mostly stemmed from parasitic outbreaks in drinking water supplies in Canada, notably Walkerton (2000), North Battleford (2001) and Kasheshawan (2005). These successes include the active involvement of watershed advisory committees which have the potential to affect local development and water planning decisions (Hurlbert *et al*, 2009). Hurlbert *et al* (2009:123) also note that there is an "urgent need to improve the efficiency and effectiveness of organizations and processes of water governance" of which fragmentation impedes the setting of clear policy objectives.

Most provinces will deal with issues of fragmentation at some level; accordingly, it is important to note that each water governance framework involves many nuances and details which differ from region to region (Brands, 2005). Therefore, the watershed governance framework for northern Saskatchewan will most likely involve some similarities to other regions within Canada but will remain unique in its scope and functions. Bakker (2007ii) surveyed the literature on water governance and considered five reoccurring issues: water exports, water legislation, drinking water protection, water rights, and accountability and transparency in water governance. The last four themes are the most significant in the context of this research.

2.2 Indigenous Water Governance in Canada

The second Report of the Royal Commission on Aboriginal Peoples (1996) noted that "for many Aboriginal peoples, the land, which encompassed not only the earth but water, the sky, all living and non-living entities, is the source and sustainer of life". In this context, the first attribute of Indigenous governance is that the "people must act as stewards of the earth" (Report of the Royal Commission on Aboriginal Peoples, 1996). Robinson *et al* (2009) explain that Indigenous environmental governance can be understood in terms of sharing and resolving natural resource

management decisions between a wide set of Indigenous, state and non-state actors that operate within and between networks operating at local, regional and watershed wide scales. Lockwood *et al* (2010) explain that some of the key principles for effective multi-level environmental governance, such as transparency, accountability, inclusiveness, fairness, integration, capability and adaptability fall in line with the ideals of Indigenous environmental governance. It has been argued that effective Indigenous governance requires "legitimate Aboriginal leaders and representative organizations, structures and processes that enable the legal and cultural authority and capacity for Aboriginal groups to make and exercise decisions, sufficient resources to establish and implement agreed decisions and arrangements, and provisions to ensure decisions and actions are accountable" (Smith, 2005:12).

Unfortunately, for First Nations and Métis in Canada, rights to water are poorly defined and have resulted in many disputes over the years stemming from the failure to honor Treaty Rights (Matsui, 2009; Phare, 2010). Modern treaty negotiations, such as those for comprehensive land claim agreements in Canada, have been pursued with heightened expectations of greater equity and a guaranteed land and natural resources base for Indigenous communities (Hannikainen, 1996). Some argue that regardless of whether Indigenous peoples hold the land under freehold or Aboriginal title, they should be entitled to determine how the land is used and protected without having to adhere to the contemporary approach to understanding and controlling resources brought forth by rational planning; a practice that has dominated western policy making (Allan *et al*, 2008; Robinson, 2009).

In Canada, water on Aboriginal land is regulated by the federal government. There are three departments within the federal government that share the primary responsibility for delivering safe drinking water to First Nations reserves: Aboriginal Affairs and Northern

Development Canada (AANDC), Health Canada (HC), and Environment Canada (EC), (AANDC, 2008). First Nations communities, through their Chiefs and Band Councils, are responsible for the design, construction, operation and maintenance of their water systems, for which they assume 20% of the costs after the initial installation (Simeone, 2010).

A 2001-2002 AANDC report indicated that almost three quarters of drinking water systems in First Nations communities were at significant risk (AANDC, 2002). A decade later, research still demonstrates that many First Nation communities lack adequate access to safe drinking water (Simeone, 2010). In 2005, a report by the Commissioner of Environment and Sustainable Development pointed out that reserves – unlike most provinces – do not have regulations or legislation governing drinking water (Dhillon, 2010).

Instead of an overarching legislation regulating drinking water provision and quality standards, a framework of administrative rules to regulate various elements of water procurement has been created by AANDC and Health Canada (HC). However, these rules are administrative regulations rather than legally binding legislation and it appears that no federal agency has tried to seriously implement safe drinking water legislation for First Nations (Peterson, 2002).

As a result, the regulatory system is not fully comprehensive and faces numerous core issues and obstacles. Roles and responsibilities remain unclear because key areas are not regulated by the current framework or are divided among too many over-arching regulating bodies and stakeholders (Dhillon, 2010). This issue is compounded by the fact that these specific roles and responsibilities are not defined in legislation and poorly regulated (Graham & Fortier, 2006). The current system also makes it increasingly difficult for information to be shared and

for any party to establish the efficiency of a water performance system (Graham & Fortier, 2006; Dhillon, 2010).

However, many First Nations experience other difficulties as well. In addition to the absence of a regulatory framework and the lack of clarity regarding roles and responsibilities, central issues relating to the provision of safe drinking water on reserves include the high costs of equipment for, and construction and maintenance of facilities in remote locations, infrastructure that is either obsolete, entirely absent or of low quality, limited local capacity and ability to retain qualified or certified operators and, the lack of resources to properly fund water and waste water system operation and maintenance (AANDC, 2006; Fournier, 2012).

Northern Saskatchewan is home to approximately 42, 000 residents, of whom over 80% are self-identified as Aboriginal (Government of Saskatchewan, 2011i). In addition to the challenges mentioned above, First Nations residing in the north of the province also face other issues associated with location. This large area has significant implications for travel time and costs, particularly with air travel and safety in travel on often poorly maintained gravel and ice roads (Desapriva *et al*, 2010).

While these residents face unique challenges because of many factors such as geographical isolation and small populations, Indigenous peoples have the opportunity to become major players in areas such as resource management and environmental protection (Notzke, 1995; Booth, 1998). Research in the area of the relationship between institutional factors and community improvement in Canadian Indigenous communities became prevalent in the early 1990s with Cornell & Kalt's (1992) empirical study of First Nations reserves in Canada. The main conclusions of this study were such that having authority over decisions

affecting their local environment, the ability to exercise power through effective institutions and choosing the appropriate economic policies and projects were the most effective forms of local development (Cornell & Kalt, 1992).

There is no set model for "good watershed governance" from an Indigenous perspective due to the diversity of language, history and culture of Canada's various Indigenous groups (Plumptre & Graham, 1999). However, Plumptre & Graham (1999) noted a general consensus among academics and Indigenous leaders on the need for Indigenous groups to develop their own definition of watershed governance, one which would resonate with both traditional and contemporary forms of governance.

2.3 Watershed Councils & Decentralized Watershed Governance

There is a growing literature on the question of Indigenous governance and, in particular, how it might interface with different forms of resource governance especially decentralized governance (Institute on Governance, 1998; Moore, 2009). An example from the Northwest Territories points out that the two re-occurring themes for governance in Indigenous groups is consultation and engagement in the policy process (Government of NWT, 2009). This was reiterated in the *Northern Voices, Northern Waters* (2009) water strategy signed between AANDC and the NWT government. The NWT has four active Land and Water Boards that can showcase an example of decentralized water governance (Robins, 2007). Decentralized water governance devolves the authority from an over-arching governing authority to smaller or independent actors at a regional or local level (Lane, *et al*., 2010). Decentralized governance is said to enhance efficiency, equity, democracy and accountability, as well as improve local participation, ownership and commitment (Ribot 2002; Bradshaw 2003).

Robins (2007) identified and discussed 115 decentralized organizations in Canada; examples of decentralized governance at the watershed scale varied across the country and included, but were not limited to, watershed organizations and watershed councils, land and water boards and conservation authorities (Robins, 2007). Decentralized water and watershed governance is important to this study because it provides a measurable example that has shown promising results in water management at a regional scale (Robins, 2007), and amongst Indigenous groups (Keogh *et al.,* 2006).

The type of decentralized water governance which is the most valuable to this research is watershed councils. Griffin (1999) defines watershed councils as "local groups that form to collaboratively participate in the management of water and other public natural resources at the scale of a watershed" (Griffin, 1999:505). Watershed councils first surfaced in North America in the mid-1990s (Curtis, *et al*, 2002; Lavigne, 2003) and rose up in popularity as American federal agencies started shifting from single administrative efforts to deal with pollution and degradation towards more comprehensive resource restoration initiatives (Lavigne, 2003). Since then, watershed councils have evolved as a response to community dissatisfaction with public natural resource management (Wilson, 2004).

Wilson (2004:78) suggests that watershed councils might be one of the most effective ways to provide the opportunity and mechanism for First Nations and relevant shareholders "to better identify, communicate, coordinate and implement stated water quality goals and objectives at the local, provincial and federal levels". Many scholars, interest groups, elected officials and agency administrators, are viewing the grassroots watershed council approach as the solution to problems associated with existing public participation mechanisms (Getches, 1998; Riebsame, 1997).

Watershed councils attempt to increase the influence of local citizens in agency management of public natural resources and, in many cases, they have been effective in doing so (Rieke & Kenney, 1997; Wondollecj *et al*., 1996). Observations of different case studies and of grey literature seems to reveal that the main themes affecting these councils involve reducing bureaucracy, fostering productive discussion and understanding among stakeholders, and providing financial, technical, and coordination support (Wondollecj *et al*., 1996). Two important characteristics of watershed councils are the reliance on voluntary, community-based action and a consensus-based decision-making process (Curtis *et al.* 2002). Some of the underlining gaps in watershed council literature include addressing the sustainability of watershed council initiatives and the appropriate scale for management of watershed councils (Lavigne, 2003; Habron, 2003).

The Yukon River Inter-Tribal Watershed Council (YRITWC) is an example of a successful Canadian, American and Indigenous watershed council. The YRITWC is a local grassroots organization representing more than 60 tribal councils and First Nations throughout the Yukon River Basin (YRITWC, 2010). The YRITWC holds a 50-year vision statement with one over-arching goal: "to be able to drink water directly from the Yukon River". The YRITWC has already been involved in multiple activities such as the construction of a steward-based water-quality program (YRITWC, 2010). Through a collaborative effort, YRITWC has been involved in partnerships with the US Geological Survey to develop and implement a basin-wide water-quality program (Schuster & Maracle, 2010).

In 2005, Harvard University recognized the innovations brought forth by the YRITWC as an award-winning program. The Council was described as "a model of self-determination, governance, and collaboration" and has received high achievements in the areas of "the

development of a complex and high quality operational system; and the impact and reach of the Council on the health of Native peoples along the Yukon River and beyond" (Harvard University Kennedy School of Government, 2005).

The YRITWC offers a prime example of a successful Indigenous watershed council in which many of its key characteristics (framework, scale, Indigenous-based, geographical location, issues and challenges, similarities in governance and institutional arrangements, to name a few) are similar and could be transferable in the creation of a framework for a northern Saskatchewan watershed council.

2.4 Capacity Building

Examples of decentralization in water governance in Canada provide informative arenas for the exploration of capacity building needs which can also be applied in the context of northern Saskatchewan watersheds. Capacity building in water management means the ability to fulfill responsibilities and to provide services, meet objectives and to sustain acceptable drinking water guidelines (de Loë *et al.,* 2002; Pirie *et al.*, 2004). Literature indicates that capacity building is important at both the development and implementation stages of water management plans and highlight the importance of legal, institutional, social and financial capacity for the implementation of these plans (Pirie *et al*., 2004; Ivey *et al*., 2006). Capacity building is an important concept relating to this research due to the initial disadvantage that is found in rural and sparsely populated regions and communities, such as communities in the north of the province, in face of undertaking wider water management and planning goals (Furuseth & Cocklin 1995; Krajnc, 2000).

Gargan (1981: 652) defines a local government's capacity as "its ability to do what it wants to do". Through this definition, a local group can be said to have, or lack, capacity to perform a variety of functions. Grindle & Hilderbrand (1995) have identified five dimensions of capacity: the action environment (social, political, and economic milieu); the institutional context (government policies, procedures, rules and regulations roles and responsibilities; financial support); the task network (communication and interactions among all organizations involved in a particular task, e.g., water management); organizations (resources, goals, activities, leadership) and; human resources (training, recruitment, utilization, retention). Although context, scale, and terminology differ, many indicators of capacity are common (Ivey *et al*., 2004).

Kettl (2002) argues that the basic challenge associated with effective governance and policy success is one of capacity. Similarly, Thai *et al* (2007:349) has argued that capacity for effective governance is directly related to the strength of its social capital, where social capital represents the "extent to which community develops a web of horizontal, cooperative relationships built on trust".

The development of effective collaborative capacity is also another avenue which promises to address the current governance and water quality and quantity challenges in northern Saskatchewan. According to Weber *et al* (2005:679), collaborative capacity "emphasizes the integration of multiple specialized ''functions'' rooted in traditional bureaucracies, collaboration across a variety of different policy arenas and levels of government, and the active engagement of citizens, communities, and nongovernment organizations in problem-solving and implementation processes". The focus of collaborative capacity lays in its partnerships, which link across vertical–horizontal systems and between agencies in the established vertical bureaucratic system as well as the community, or horizontal level (Weber *et al*, 2005).

Timmer *et al.* (2007) addressed the issue of capacity for water management and source water protection in small communities (fewer than 10,000 people). The major capacity components from this research included financial, human, technical, institutional and, social capacity through which it was noted that effective source water protection and water management required all these dimensions of capacity working together. Financial capacity remains the most commonly cited key to success in watershed management (Leach & Pelkey, 2001; Litke and Day, 1998) and is defined by the ability to generate and access funding (Goodman et al.1998; de Loë et al., 2002; Timmer et al 2007;). Human capacity is defined as "the knowledge, skills, and abilities of individuals such as town planners and utility operators" (Trimmer et al, 2007:190) where individuals are challenged and have opportunities for further training, skill development and education (Hartvelt and Okun, 1991; Grindle and Hilderbrand, 1995; Franks, 1999). Institutional capacity is defined by the local plans and by-laws to address watershed management and protection and the support for watershed protection through initiatives, policies, regulation and legislation (Timmer et al, 2007). Social capacity includes the leadership, partnership and communication between stakeholders involved in watershed management. This also includes the coordination of stakeholders, vision and direction of water management plans (Goodman et al., 1998; de Loë et al., 2002). Finally, technical capacity involves the ability to undertake water management plans through access of reliable data and effective monitoring techniques (Meyer, 1990; Ffolliott et al., 2002).

De Loë and Plummer (2010) identified five capacity development challenges specific to decentralized watershed governance which include: 1) the existence and retention of technical expertise (human capital); 2) the dependence on good working relationships with governments and other stakeholders to realize management goals and inadequate cross-organizational sharing

and learning(social capital); 3) absence of strategic plans to guide implementation and inefficacy of establishing and supporting independent over-arching coordination and advocacy organizations (institutional capital); 4) staffing inequalities between jurisdictions, raising revenues independently from governments (levies, charitable funds…), overcoming operational constraints within the government reluctance to invest in overheads and ongoing costs and to commit to long-term, non-project based resourcing (economic capital), and; 5) the ability to collect reliable data with expertise and continued monitoring (technical capacity)(de Loë & Plummer, 2010).

Capacity development challenges for decentralized watershed governance bodies such as the ones highlighted above have been demonstrated to be ubiquitous in both the Canadian and Australian context (Lane, *et al*., 2010). Lane *et al*. (2010) examined decentralized governance and concluded similar results: that to varying extents, the governing bodies struggled financially, retention of quality staff became problematic and cross organizational and community relationship building was difficult. These challenges are significant because in most cases these organizations were created out of a need to address nationally and regionally important issues, such as water governance, and their success or failures had wider-ranging implications (Lane, *et al*., 2010).

2.5 Summary

As seen in the above literature review, current discourses in Indigenous watershed governance in Canada are limited, especially in relation to northern Saskatchewan. Although First Nations have been marginalized from the governance of their resources, there lies a potential in exploring changes in governance structure in the north of the province. Water management through the use

of decentralized water governance methods such as watershed councils demonstrate a promising opportunity for First Nations in Canada to move forward on issues of both water quality and water governance. Capacity building needs for the creation of a watershed council might prove to be challenging. The use and creation of a watershed council in northern Saskatchewan has the potential to provide a mechanism to improve current fragmented approaches in watershed jurisdiction, provide sound and healthy watershed management and to empower local communities.

CHAPTER 3
RESEARCH METHODS

The goal of this research was to identify the institutional arrangements and capacity-building requirements necessary to support watershed governance in northern Saskatchewan. To help achieve this goal, a list of interview questions was developed and a list of key informants was prepared and contacted via telephone and e-mail. A total of 30 participants participated in this project and agreed to take part in the semi-structured interview process. The questions were approved by the Behavioural Research Ethics Board at the University of Saskatchewan in April 2011 (See Appendix 1). The interviews took place between May 2011 and October 2012 in Saskatchewan; more specifically at the University of Saskatchewan, in Saskatoon, in Prince Albert and, in Hatchet Lake First Nation. The snow-ball technique was used throughout the interviews to gather additional potential participants.

These questions were developed to gain greater knowledge of the current watershed governance structure in northern Saskatchewan while obtaining valuable opinions on the current challenges in watershed governance, the ongoing concerns with water quality and quantity and support for the creation of a northern Saskatchewan watershed council. A total of eleven questions were developed. The interview questions can be found in Appendix 2.

In addition to the semi-structured interviews, a literature review was carried-out in the spring and winter of 2010-2011. This review included an overview of academic, peer-reviewed and non-academic literature used to supplement the results gathered from the semi-structured interviews. The addition of literature to this research helps to provide support for theory on watershed governance in the Canadian context and includes topics on capacity-building,

Indigenous water governance and various types of watershed governance systems, including watershed councils (refer to References in Chapter 7).

3.1 Interviews

Key informants were first contacted in May 2011 via phone and e-mail to provide an overview of the project and to ask their permission to be participants. These key informants were identified through a web-review of influential actors and organizations and were compiled in a list of potential participants. Initial interviews provided further contacts of influential northern actors through a "snow-balling" technique. As an attempt to gather a strong sample of responses from various levels of leadership and authority, representatives from governmental agencies, First Nations groups and organizations and various non-governmental groups and actors were invited to participate in this research.

Involvement in the north was deemed one of the most important conditions in selecting participants. Participants who have some stake in the north or are knowledgeable about the current issues in the north of the province provide information of higher quality than a stakeholder having little to no influence or background in the research. Participants selected for this research were either: current northern residents, persons having once lived in the north or persons having some involvement in northern affairs. Participants varied from a multitude of cultural and professional sectors; representatives from provincial agencies, local community-based initiatives, municipal authorities, community spokespeople, northern research groups, major Saskatchewan industrial actors, non-governmental groups, Indigenous groups and northern community members.

Interviews with community members from Hatchet Lake First Nation were included in this study to further establish the connection between water governance and local Indigenous perspectives and a community visit was made possible through an arrangement with the Prince Albert Grand Council. Community members from Hatchet Lake First Nation represent ideal candidates for this study because this community hosted the "Keepers of the Water IV" gathering in 2010, at which the resolution for a watershed council was first passed. Interviews in Hatchet Lake First Nation were made in person throughout the month of December 2011. In certain cases, especially when addressing community Elders, a community member helped in facilitating translation from Dene to English. In order to provide a more accurate data analysis in the result section, research participants were separated into four broad categories: industry, governmental, non-governmental and residents from Hatchet Lake First Nation. A breakdown of participants by organization and by sector can be found in

Table 1.

Table 1: Participant Breakdown

Organization	n	Participant Count	Sector
Hatchet Lake First Nation – Band Representative	1	10	Indigenous 33%
Hatchet Lake First Nation – Community Development	1		
Hatchet Lake First Nation – Community Members	2		
Hatchet Lake First Nation – Elders	4		
Hatchet Lake First Nation – Health Office	2		
Prince Albert Grand Council (PAGC)	1	9	Governmental 30%
Saskatchewan Environment - Northern Saskatchewan Environmental Quality Committee and Northern Mines Monitoring Secretariat (*EQC*)	1		
Saskatchewan Environment - Uranium and Northern	1		
Saskatchewan Environment – Industrial Branch	1		
Saskatchewan Environment	1		
Government of Saskatchewan – Northern Municipal Services & Planning	2		
Saskatchewan Watershed Authority	2		
AREVA Resources Corporation	1	5	Industry 17%
Cameco Corporation	1		
Mystik Management	1		
Oilsands Quest Inc.	1		
Sask Water	1		
Aboriginal Education Research Center, Athabasca	1	6	Non-Governmental 20%
New North – Northern Administration District	1		
Northern Resident/Activist	1		
Prince Albert Model Forest	1		
Saskatchewan Association of Watersheds (SAW)	1		
Safe Drinking Water Foundation (SDWF)	1		
TOTAL	**30**	**30**	**100%**

At the beginning of the interview, participants were asked to state their name, the organization to which they belonged and their role in watershed governance in Saskatchewan. This question was posed as a pre-cursor to determine the current watershed governance framework in northern Saskatchewan. The responses to this first question can be found in Appendix 3.

All participants were provided with a short description of the study to generate context prior to the interview. If requested, participants were sent a copy of the interview questions via e-mail before the interview. In the case where a participant felt uncomfortable with the voice recorder, hand written notes were taken throughout the interview. The interviews were recorded using a Panasonic RR-US551 hand-held voice recorder. Participants were then asked to sign and date a consent form (see Appendix 4), which included safeguards of participant anonymity, the intent behind the study, the way in which the information they provided was projected to be used and, a 30 day study withdrawal clause. In some cases, a participant would decline the opportunity to contribute to the research for one, or more, of the following reasons:

1. The participant felt that s/he was not knowledgeable enough to contribute to the research;
2. Timing would not permit an available interview time; and,
3. The nature of the interview was too sensitive for the participant to sign the consent form.

Once the participants completed the interview and signed the consent form, the digitally recorded answers were compiled and transcribed for aggregation and analysis. Analysis was performed by separating questionnaire answers by their question order. Some general themes were retrieved based on the participants' answers'. These were: watershed governance, effectiveness of the current model, governance concerns, recommendations for more effective governance, water quality and quantity concerns, support for a northern Saskatchewan watershed council, watershed council representation and, participation in a northern Saskatchewan watershed council. Capacity needs were not specifically asked within the questionnaire, but were noted throughout the participants' answers and were categorized following both Timmer *et al.* (2007) capacity needs for watershed management and De Loë & Plummer (2010)'s capacity challenges for decentralized watershed governance. More specifically, the challenges were categorized and

noted through the following categories: Social Capacity; Institutional Capacity; Economic Capacity, Human Capacity and Technical Capacity.

3.2 Presentations & Conferences

The research proposal was presented in the form of a poster and/or presentation at the following conferences and gatherings:

- Conference on Models of Indigenous Development - Chiapas, Mexico (February 23-25 2011)
- the Canadian Association of Geographers (CAG) – Calgary, Alberta (May 31-June 4th 2011)
- Keepers of the Water V Gathering – Lac Brochet, Manitoba (August 10th-14th 2011)
- the Association of Geographers Prairie Division (PCAG) - Devils Lake, North Dakota, USA (September 16th – 18th, 2011)

The feedbacks retrieved from these presentations were deemed very valuable; notably during the "Keepers of the Water V" gathering where it was observed that the use of language in the proposed research was important. This led to a change in the research title which was originally named: "Institutional Arrangements and Capacity Building Requirements for a Northern Saskatchewan Watershed Council". This change happened due to the feedback received from northern residents, who felt that some of the words used in the title, such as the word "institutional" could be misinterpreted and could be attached to negative historical incidents or to water privatization. Other insights from this gathering included numerous observations of northern concerns with water quality and quantity, watershed governance and, the importance of using Traditional Ecological Knowledge when tackling resource concerns directly affecting Indigenous populations.

Lastly, there is strong interest for this research within the PAGC, who are currently actively pushing forward for the creation of a northern Saskatchewan watershed council. The PAGC, who originally supported the resolution at the "Keepers of the Water IV" gathering have helped in moving this research forward by sponsoring flights to Hatchet Lake First Nation and to Lac Brochet for the "Keepers of the Water V" gathering, and by providing community contacts.

CHAPTER 4
RESULTS

The results from these interviews are presented below and have been organized according to the four general sections: participant profile, current watershed governance in northern Saskatchewan, water quality and quantity concerns and the possibility of an alternative watershed governance structure for northern Saskatchewan.

4.1 Watershed Governance in Northern Saskatchewan

Most of the participants (33%, 10 participants) strongly believe that there is currently no framework for watershed governance in northern Saskatchewan. Many participants (27%, 8 participants) stated that they were not able to answer this question. Some participants (23%, 7 participants) believed that responsibility for watershed governance in northern Saskatchewan was shared by multiple governmental agencies in Canada but felt that they did not know enough about the framework to answer on the powers and responsibilities. The remaining participants (17%, 5 participants) provided an outline of the current structure. According to this last group, the Federal Government, Provincial Government and Watershed Stewardship Organizations are the major actors in the current watershed governance framework.

4.1.1 Effectiveness of the Current Governance Model

Participants were asked whether they thought the current watershed governance structure was effective. Although some participants stated that there is no current watershed governance framework for northern Saskatchewan (previous question) these same participants provided an opinion on the effectiveness of water governance .Some

participants (17%) stated that it was effective, especially in the short term and on a project specific basis. Many participants (27%) stated that they did not know if the model was effective or not and the majority of the participants (56%) stated that the current watershed governance model for northern Saskatchewan was ineffective. The general responses from these participants are shown in Table 2 below.

Table 2: Effectiveness of Northern Saskatchewan Watershed Governance Framework

Effectiveness	Responses	Ind	Gov	NGov	FN	Percent
Yes, the current governance structure is effective in managing project related impacts in the north	**2**	1	1	-	-	**YES 17%**
Yes, It's effective in the short term but not in the long term	**3**	3	-	-	-	
No, there is room for optimizing, especially overlap	**5**	1	3	1	-	**No 56%**
No, there is no framework	**5**	-	2	1	2	
No, it's not northern specific	**7**	-	3	2	2	
I don't know	**8**	-	-	2	6	**Other 27%**
Total	**30**	5	9	6	10	**100%**

Of the participants that believe that the current model is effective, two industry and government participants stated that it is effective in managing project related impacts in the north, three industry participants stated that the current structure was effective in the short term but failed to properly address longer term issues such as water scarcity, pollution, land-use planning and climate change. These responses mostly arose from industry participants whereas the focus on "effectiveness" was centered on issues within current jurisdictionally-based water

management in the north; which from the most part, seem effective. As one industry participant stated:

> "I think it's very effective on the day to day week, week month to month project management. The government clearly monitors how much water they withdraw and put reasonable limits and don't give us carte blanche to drill unlimited water wells and take water out of lakes"

Five (5) participants, including two government participants, one non-governmental participant and two Hatchet Lake participants stated that there is currently no northern watershed governance framework. According to a majority of the participants, including one industry and one non-government participant and three government participants, the main reason for the ineffectiveness of this model is due to a disconnect with information reporting and administration between northern stakeholders (5 responses in total). It was also expressed that in instances when information was shared, efforts to act on issues and concerns were often dismissed. Correspondingly, this participant group felt that the current agencies regulating water management in northern Saskatchewan were separated into too many bodies, which according to two participants, could be better aligned in order to create a clearer and consistent path to water allocation and use.

> "The structure could be made more effective by better aligning the agencies already in play so that there is more consistency in their requirements and expectations. This is true in the fulfillment of the Crown's duty to consult as well so that these efforts are undertaken and completed in an integrated fashion."

Three government, two non-government and, two Hatchet Lake participants stated that the current model was ineffective because it is not northern specific (for 7 total responses). Eight (8) participants, two non-government participants and six participants from Hatchet Lake, were unable to answer this question.

4.1.2 Governance Concerns

Participants were asked to rate their top three water governance concerns for northern Saskatchewan. Major themes, as shown in Table 3, include dialogue between all northern stakeholders and agencies, northern resident representation and Treaty rights and inconsistencies and unclear regulations and guidelines for water related issues. The major responses to this question have been aggregated and have been arranged by the number of times mentioned throughout the interviews.

Table 3: Major themes in Watershed Governance Concerns for Northern Saskatchewan

Major Themes	Times Provided	Ind	Gov	NGov	FN
Insufficient Dialogue Between Northern Stakeholders	**8**	1	1	3	3
Treaty Representation & Water Rights	**8**	-	2	2	4
Inconsistencies & Unclear Regulations and Guidelines	**7**	3	2	2	-
Inconsistencies Within Current Regulations & Agencies	**6**	1	3	2	-
Local Influence in Watershed Pollution	**5**	-	1	1	3
The capacity for local communities to influence decision making	**5**	-	1	2	2
Management Scale & Monitoring	**3**	1	2	-	-
I don't have any issues or concerns	**2**	1	1	-	-
Other	**6**	1	1	2	2
Total	**50**	9	13	14	14

Twenty seven participants provided a total of fifty (50) concerns were mentioned of which eight (8) themes were observed. The major themes in watershed governance concerns,

including insufficient dialogue between northern stakeholders, treaty representation and water rights, inconsistencies and unclear regulations and guidelines, will be discussed in the sections below.

4.1.2.1 Insufficient Dialogue Between Northern Stakeholders

Eight participants from all participant groups, including three non-governmental participants and two Hatchet Lake participants, felt that the people that reside in the north often do not have enough say or involvement in the current way in which water is managed. It was expressed that the current system does not allow for enough representation of First Nations, northern municipalities and northern residents as a whole. For four of these participants, the lack of involvement, communication, engagement and consultation with the local communities was voiced as the strongest concern with watershed governance. As expressed by one non-government participant:

> "Governance has to be [done] so that its set up and organized and consistent with connections with those communities so that everyone is on the same page, to manage waste, healthy ecosystems and clean drinking water. I always have this opinion that cities and villages should be available to drink the water downstream from them so that we always ensure that what we do doesn't impact our neighbours from down the current."

4.1.2.2 Treaty Representation & Water Rights

Concerns regarding the perception of Treaty Rights and boundaries especially with regards to water were expressed by government, non-government and Hatchet Lake First Nation. This sentiment was especially strong with Hatchet Lake participants (4), non-government participants (2) and government participants (2). The Provincial and Federal government and First Nations views on water rights are not well defined, which has caused contention both historically and

presently. As one government participant stated: "if you go and look on the "duty to consult" of the province, it's very restrictive; there are certain things that we consult on and others that we don't."

4.1.2.3 Inconsistencies & Unclear Regulations and Guidelines

Some participants, including industry participants (3), government participants (2) and non-government participants (2), indicated that the current fragmentation between governing agencies is confusing. Participants also found this problematic, not only because of the different regulations involved and the different populations who are influenced by these regulations, but also due to the size of the watersheds found in the north of the province. As one non-government participant indicated, the intricacies of working within such a large body of water can bring on some big challenges:

> "[O]ne of the big things is distance between communities and how to get everyone working together. It is such a vast watershed that spans from one side of the province to the other […] how do get the people together to work on common issues when they are so fragmented, there is also such a low population, everyone has different concerns and everyone wants to be heard".

4.1.3 Recommendations for Effective Governance

Participants were asked to elaborate on ways in which watershed governance in northern Saskatchewan could be made more effective. Of the twenty-five (25) participants that answered this question, forty-nine (49) recommendations were provided. These recommendations are found in Table 4.

Table 4: Top recommendations for More Effective Watershed Governance in Northern Saskatchewan

Recommendations for Effectiveness	Times Provided	Ind	Gov	NGov	FN
Consultation with Aboriginal Residents	14	-	2	3	9
Involvement & Engagement	9	1	2	4	2
Funding	6	-	2	4	-
Monitoring	5	1	2	1	1
Provincial Leadership	5	-	1	4	-
Access to Information	5	1	-	2	2
Management Scale	2	-	2	-	-
Other	2	2	-	2	1
Total	**48**	**5**	**11**	**20**	**15**

The top recommendations for a more effective watershed governance will be discussed in the sections below and include more and better consultation with Aboriginal residents, public ownership, involvement and engagement and, more and effective funding. Further recommendations included more and effective monitoring (5), provincial leadership in watershed issues in the north (5), access to information (5) and resizing watershed management scale (2). One participant recommended the maintenance of fish habitat, while another participant stated that no changes were necessary to make watershed governance more effective. These last two recommendations were placed in the "other" category.

4.1.3.1 Consultation with Aboriginal Residents

The importance of having Indigenous representation in water issues was a dominant concern throughout most interviews and was mentioned on fourteen (14) separated occasions; these were mostly mentioned by Hatchet Lake participants (9) but were also mentioned by other participant groups, notably non-government participants (on 3 accounts) and by government participants (on 2 accounts). The inclusion of Traditional Ecological Knowledge (TEK) was repeated as a central tool to strengthen the effectiveness of watershed governance in the north, through which TEK could bridge the parallel between western science and community involvement. The relevance in having multiple Indigenous languages, such as Cree, Dene and Saulteaux, was also reiterated as a way to create an open and free dialogue with local residents. Emphasis regarding the creation of a template or planning model that is flexible and inclusive, with importance of traditional words was deemed crucial to watershed planning. This would require inclusion of First Nation and Metis governments in most aspects of consultation and planning while insuring that Elders and Indigenous residents are included in any decisions made regarding northern water resources. One industry member alluded to the idea that the Indigenous consultation process should be left with the communities and should not reside at the ministry of the environment as a way to create a more effective consultation process. According to this participant, one of the major obstacles to effective watershed governance is the way in which the current consultation process is carried out. The current process involves many steps that often result in miscommunication and oversight. As this participant explains:

> "The regulators send out these letters and have never been in northern Saskatchewan, have no idea what's going on up there and this just lights a fire. It's not a proper consultation. First Nations consultation is a hard thing, it resides with the Ministry of Environment and most of the time, we don't even know where this stuff goes - it's like a black hole […] it's just a process that's a waste of time".

4.1.3.2 Involvement & Engagement

The weight associated with public involvement in programs such as Northern Saskatchewan Environmental Quality Committee, Athabasca Working Group, and Environmental Assessment public review periods were considered as significant in improving watershed governance and were mentioned on six (6) different occasions; these responses included two (2) participants from Hatchet Lake, three (3) non-government participants and one government participants. The current lack in public participation was attributed to the complexity of the current consultation process and to public ignorance of the programs that are in place to engage participation. Other responses included the creation of a stronger educational component within the current system where residents could find avenues for engagement; ideally grassroots in nature, created through local programs and groups. Another recommendation stated called for stronger mechanisms to engage communities with their environmental interactions. It has been suggested that a heightened sense of public involvement and ownership with local watersheds would result in greater environmental stewardship. As stated by one participant:

> "It needs to be recognized that it is not only industry that influences water quality and quantity but it is also communities and individual businesses. Lack of education on water issues applies to northerners [residents] as well as outsiders."

4.1.3.3 Funding

Recommendations relating to capacity and funding were mentioned on six (6) different occasions, with responses originating from government (2) and non-government (4) participants. One government participant suggested that in order to increase watershed governance in the north, there needs to be an expansion of the current model developed in the south. In this respect, the current southern model would have the opportunity to cover the province as a whole.

In order to make the appropriate changes and to engage in northern watershed planning, financial capacity becomes an important issue. As this government official stated:

> "An increase in resources to the agency, our agency in terms of long term and guaranteed funding rather than the come and go funding that is on an annual basis, which you can't do much planning when there is financial uncertainty. There needs to be recognition that a guarantee of central funding should be available to support these long term initiatives and efforts for long term commitment."

Other recommendations included the increase in financial capacity to enable grassroots watershed groups to keep providing results such as reports and community engagement. The importance of recognizing the key roles and functions that the SWA are doing for the province and giving them more authority were also suggested as ways in which to improve watershed governance. A final recommendation stated the need for better organization and funding to include the monitoring of northern water resources by the SWA.

4.2 Water Quality & Quantity Concerns for Northern Saskatchewan

In this third section of the results, participants were asked to state their top three (3) water quality and quantity concerns as an effort to better understand how these might interface with current watershed governance concerns in northern Saskatchewan. All thirty participants answered this question; seven (7) participants provided three concerns, thirteen (13) participants provided 2 concerns and, ten (10) participants offered one concern for a total of 57 concerns (see Table 5).

Table 5: Water Quality & Quantity Concerns for Northern Saskatchewan

Major Concern	Times Provided	Ind	Gov	NGov	FN
Acid Rain	10	2	2	3	3
Community Based Contamination	9	2	1	2	4
Raw Water Condition	9	5	1	3	-
Treated Effluent from Industry	8	-	1	3	4
Climate Change Impacts	6	2	2	1	1
Impact of Hydro Development	5	-	1	2	2
Fish Health	3	-	2	1	-
Mining Legacy issues	3	-	1	1	1
Impact of Forestry Activities	2	-	1	1	-
Other	2	1	-	-	1
Total	**57**	**12**	**12**	**17**	**16**

From the information gathered, seven (7) major themes were noted. The main four concerns; acid rain and environmental impacts (10), public understanding of water (9), clean and pollution-free water (9), and treated effluent from industry (8) will be discussed further below. Other concerns included tourism and movement of populations in the north

4.2.1 Acid Rain Impacts

Inflows and air contaminants coming from the Alberta through oil development, more specifically the impact that the tar sands in Fort McMurray was expressed as an important impediment to water and environmental quality in northern watersheds by all participant groups,

including industry participants. A government interviewee explained that due to the significantly different geology found in the north of the province, watersheds express a heightened sensibility against acidification. Inflows from oil development, not only affect lake acidity but also impact the surrounding environment, including the potential of groundwater contamination, which becomes a greater environmental and land-use planning issue (Malone, 1990). Other environmental impacts include participant concerns relating to stress amongst fish species, flooding and drought, changes in ecology, precipitation, climate change and the impacts on flows. As stated by a government official, "climate change transcends every geographical location [but] these effects will definitely show more acutely in the north, especially in the far north … [which should be] a concern for all of us".

4.2.2 Community Based Contamination

The importance of public understanding of water quality was an issue which was repeated throughout the interviews, important for all participant groups and, was especially concerning for Hatchet Lake First Nations residents as it was explicitly mentioned on four (4) separate accounts. Community-level water contamination can become a serious concern, especially with respect to proper municipal waste management. According to some interviewees, incidents where poor fuel storage resulting in contamination of nearby water bodies has emerged in the past. These participants also indicated that some communities often blamed industry for water pollution and contamination when in their opinion; most local water pollution came from household waste. As one participant stated:

> "[T]he people in Wollaston will get very excited about things happening at Rabbit Lake. But as recent [events] show us with the huge oil spill they are not ready to move fast enough to deal with it".

4.2.3 Raw Water Condition

Northern Saskatchewan's major industrial developments are mining and exploration (particularly uranium), forestry and more recently oil and gas (Northern Development Ministers Forum, 2012). All these industrial players require a significant amount of water withdrawal in order to conduct their operations. Certain industrial players, especially participants in the oil industry, also require quality water, clean of impurities. Accessibility to quantity and quality of water sources to maintain operations make up some of the major reoccurring concerns for industry players in northern Saskatchewan. As one industry participant explained:

> "We use lots of water […] we need to be concerned that we have clean water with low TDS for the oil company, it affects our process to generating steam with it. We need to clean the water up."

This concern was especially important for industrial players who mentioned this issue on five (5) different accounts.

4.2.4 Treated Effluent from Industry

Participants noted concerns with the treatment of effluent from industry as a main concern for northern Saskatchewan watersheds. Some participants expressed that they felt disconnected from industrial activities and were frustrated with the lack of communication, monitoring and reporting that came back to their communities. These sentiments were especially strong with community members from Hatchet Lake First Nation as this issue was explicitly mentioned on four (4) different accounts. As one community member explained:

> "My main concern is the mining. The water in our main system; we rely for water on every aspect of our lives...I'm worried about my grandchildren. What will happen to them if something happens to the water?"

Untreated effluent and the disconnects between reports from industry and government are of great concern especially for northern residents and non-governmental participants (mentioned on three different accounts) who are also major watershed users.

4.3 Support for a Northern Saskatchewan Watershed Council

In this fourth section of the results, participants were asked to state their opinion on the validity of a watershed council as a foreseeable option for northern Saskatchewan. All thirty participants answered this question; answers have been outlined in Table **6**.

Table 6: Watershed Council for Northern Saskatchewan

Watershed Council	%	N	Ind	Gov	NGov	FN
Yes	**53%**	**16**	1	4	4	7
Conditional	**33%**	**10**	2	3	2	3
No	**13%**	**4**	2	2	-	-
Total	100%	30	5	9	6	10

A strong majority (53%) of the participants, mostly representatives from non-government (4), government (4) and Hatchet Lake (7), answered that they did want to see the creation of a council for northern Saskatchewan, especially to promote public engagement in northern watershed issues. Many participants (33%) from all participant groups, especially from government (3) and Hatchet Lake (3) mentioned that they would be willing to see this as an option but remained skeptical about the structure of the council and its long term objectives and vision. Some participants (13%), more specifically governmental representatives (2) and industry players (2), stated that a watershed council for northern Saskatchewan would not be a good

option. This sentiment was mostly expressed because of the already numerous groups and organizations that are active in the north.

Some participants provided multiple reasons why they thought a watershed council may or may not be a viable option for the north. The main favorable, conditional and opposing arguments for the creation of a northern Saskatchewan watershed council are examined further in the sections below.

4.3.1 Favorable Arguments for the Support of a Northern Saskatchewan Watershed Council

The importance of effective results and tangible goals (10) were mentioned for the majority of participants who would want to see a northern Saskatchewan watershed council; this was mentioned by all participant groups, but most notably by Hatchet Lake participants (6). One non-governmental participant noted:

> "There needs to be a northern Saskatchewan watershed council […] for the council to be effective, [it] needs to be as a-political as possible and have both long and broad view. And the other tricky thing that comes into play is can this council actually have any authority? Or will it simply [be] an advisory council?"

A strong majority of participants in support of a watershed council also stated that there would need to be proper representation of northern stakeholders (7) as this council could potentially act as a catalyst for further northern resident involvement in water issues; this sentiment was shared by almost all participant groups, but most notably government participants (2), non-government participants (3) and Hatchet Lake participants (2). As one government participant stated:

> "These types of things are essential. The more informed and vocal that citizens are about these issues, the better off we will be and future generations are going to be […] Empowering people at the local level to have an avenue where their interests are laid out on the table in a mediation type setting is definitely something that we need".

One non-government participant believed that it was an absolute need for the north (1).

4.3.2 Conditional Arguments for the Support of a Northern Saskatchewan Watershed Council

The main conditional response provided was uncertainty related to the structure and framework of the watershed council and its level of effectiveness in creating dialogue and creating results (7); of which government (3) and Hatchet Lake participants (2) mentioned the most times. As one participant stated:

> "It's a matter of federal and provincial governments providing a framework within which the stakeholders of the north could be effectively engaged and providing a forum within which water management issues can be discussed. If there is the proper framework where everybody is constitutional, obligations can be reflected that would be great".

Other opinions, especially from government participants (as mentioned on 3 accounts) included the roles and responsibilities that this watershed council might play within the current governance framework (5) and the amount of available capacity in the north to actually initiate this watershed council (3). One industry participant explained:

> "Depending on what it would look like (framework), as a stakeholder in the north, we have had a long standing relationship with stakeholders in the north and are very much interested in continuing in that engagement. But again, without knowing how this framework would integrate with federal and provincial context it's difficult to say".

4.3.3 Opposition Arguments for the Support of a Northern Saskatchewan Watershed Council

The main reason provided against the creation of a northern Saskatchewan watershed council was that there is no need for an additional structure in the north as there are already governmental-based mechanisms in place (3). This sentiment was mostly expressed by industry members (2). As one industry participant stated:

> "[The SWA] have the know-how, the staff the data, the money. They have the connections with inter-provincial agencies that would help them makes those decisions. They do watershed management plans […] is [water] the most important thing happening in Saskatchewan? No. […] I don't think that there is a big problem in water basins in northern Saskatchewan (issues) that dictate that we need to do this in less than 5 years. At the end of the day, there will be nothing to come across that is different than what's going on right now. There are not that many water issues going on".

Other opinions included the sentiment that capacity could be better spent on other projects (2), that there were already too many northern actors (2) and, that there were no immediate environmental and watershed concerns for the north (1). One government participant stated:

> "In my opinion, a watershed council would not be beneficial. Mapping watersheds would be resource intensive with little gain. Would the watershed council be responsible to map and collect water quality data for each watershed? A number of samples would be required to adequately determine water quality (seasonal fluctuations, etc.). If so, what would the data be used for? There is public information currently available which demonstrates water quality in project areas. Is there any benefit to collect data in areas that are not impacted by projects?"

4.4 Watershed Council Representation

Participants were asked to state their opinion on who should be involved in a northern Saskatchewan watershed council. Twenty three (23) participants answered this question and the results have been categorized in Table 7.

Table 7: Northern Saskatchewan Watershed Council Representation

Representation	Times Provided
First Nations (Including community members, more specifically elders and youths from each northern community)	22
Government (Including the Ministry of the Environment, DFO, Health Canada, AANDC, SWA)	21
Non-Governmental Organizations including special interest groups	19
Northern Communities (Including local governments and community organizations)	17
Industry (Northern industrial players including Areva, OilsandsQuest & Cameco)	8
Representatives from northern Metis settlements	6
Tourism & Recreational Stakeholders	6
Academia and Research	5
Everyone	10
Total	**114**

Almost all of the participants who answered this question (22) stated that First Nations should be involved in this council. Government involvement (21) and non-governmental organizations (19) were also stated as having an imperative place within a northern Saskatchewan watershed council. One non-governmental participant noted:

> "First Nation groups in northern Saskatchewan would want to have a place on that council; I believe that the enterprise regions in the north would want to have involvement – because our jobs are to develop the region economically but also to ensure that we are not destroying water, so our job is a tough one. We need to balance industry and development and ensure that that balance is kept with the environment. So we always have to be mindful of that, and we need those groups to bring us down to earth".

The involvement of northern communities (17) and of northern industrial players (8) was deemed important. Representation from northern Métis settlements (6), tourism (6) and academia (5) were also stated as important actors to be included in the watershed council framework. The (10) participants stated that every northern stakeholder should be involved in this council. As one non-governmental participant stated:

> "Government, senior minister manager level as well as down to the bureaucratic level, right through to absolutely the operating companies that want to work on projects in the region, whether that is through a forestry project and other projects…especially the communities - it's up to them to identify who is involved, the mayor, the town councilors, the individuals that volunteered to be part of councils and committees. In a generic sense I'd say that the local people have to be involved and the government needs to be involved. Industry really needs to be involved because they have the biggest likelihood of causing an impact…once you start doing something; you start running the chance of changing something".

The information provided in Table **8** suggests that representation needs to be mixed with multiple players.

4.4.1 Watershed Council Participation

In the last question, participants were asked whether they would be willing to participate in a northern Saskatchewan watershed council. Twelve participants (40%) stated that they, or their organization, would be willing to participate. Eleven participants (37%) answered conditionally and, one participant stated that they would not want to take part of a council (3%). Six participants (20%) did not answer the question. The following Table 8 demonstrates these responses.

Table 8: Watershed Council Participation

Participation	Ind	Gov	NGov	FN	Total (n)	%
Yes	-	3	3	6	**12**	**40%**
Conditional	3	3	3	2	**11**	**37%**
No	1	-	-	-	**1**	**3%**
No Response	1	3	-	2	**6**	**20%**

Most of the participants from Hatchet Lake First Nation (6) stated that they, or their community, would like to be involved in a northern Saskatchewan watershed council. Some government (3) and non-government (3) participants also expressed interest in participating. As one government official stated: "Yes. We have the capacity, we have three positions doing planning, we always have other priority, but certainly we would participate as staff that we could make available".

Conditional responses to joining a watershed council can be seen in all participant categories. These responses range from conditionally agreeing as long as the watershed council amounts to tangible ends, to conditionally agreeing if it becomes a need for the participant or the participant's group or organization to become involved. As one industry member stated:

> "If it was seen as necessary (i.e. other institutions do not provide the necessary oversight and management at present and could not be changed to do so) and one was formed, we would be willing to participate".

One participant stated that they would be against the idea of a watershed council and would not agree to participate.

4.5 Capacity Needs for Northern Saskatchewan Watershed Governance

Capacity needs were carefully noted throughout the interview process following Timmer *et al.* (2007) and de Loë & Plummer (2010)'s capacity challenges for decentralized watershed governance. These capacity challenges include: social capacity, technical capacity, institutional capacity, economic capacity and, human capacity (de Loë *et al*., 2007). The following Table 9 demonstrates the noted capacity needs.

Table 9: Capacity Needs for Northern Saskatchewan Watershed Governance

Types of Capacity Needs	**Times Noted**	**Ind**	**Gov**	**NGov**	**FN**
Social Capacity	18	3	4	6	5
Technical Capacity	15	2	6	5	2
Institutional Capacity	14	3	7	4	-
Economic Capacity	11	-	4	5	2
Human Capacity	10	1	4	3	2
Total	**68**	**9**	**25**	**23**	**11**

The biggest capacity need noted throughout the interviews was social capacity. Many participants stated that proper information sharing; constructive dialogue and greater managerial goals would often fail in light of the current governance structure and other northern challenges. As stated by a government official:

> "Policies and plans and it is hard for local people to implement this kind of stuff. It's a very different world up here. People don't really have the tools to follow through with plans. It's slow and long process".

Scientific capacity was also stated as a major need for northern Saskatchewan. Many participants were especially concerned with the lack of monitoring and the lack of scientific knowledge in the north. As stated by a government official:

> "Capacity is needed [especially] in the sense of the technical ability to understand the issues […] if a local community has concerns about the water supply […] there is very little capacity of trained expertise for technology and groundwater science, chemistry […] there really isn't anyone in those communities that has training or capacity. And therefore, if the community is to be involved in a dialogue between industry and government, they are going to need support from consultant, etc. to advise them on questions they should be asking and answers that they should be getting – the discussion becomes scientific at a certain level".

Other capacity concerns came to light throughout the interviews; notably institutional and human capacity as can be seen by the following statement from a government official:

> "I believe that the administration and the red tape is a bit of an issue; because we do suffer from low academics in the far north and even though we can stand and talk about things, not a lot of our people are well versed in computers and all of the technology that is up today. This is where you need to bring capacity and maybe some experts on governing water to advise us".

The overall results uncovered from this research will be further discussed and analyzed in the following discussion chapter.

CHAPTER 5
DISCUSSION

In this section, the results from this research will be discussed in order to identify the themes that have emerged throughout the course of the research. This discussion will be separated into the following broad themes, 1) watershed governance 2) water quality and quantity concerns for northern Saskatchewan, and 3) the creation of a northern Saskatchewan watershed council

5.1 Watershed Governance

Multiple different views on the current watershed governance framework in northern Saskatchewan were observed in the results. The participants' positive responses to the current watershed governance framework (17%) ranged from stating some of the different governmental roles and responsibilities to the major roles and responsibilities of each department and how this interfaced with the interviewee's actions within the watershed.

One of the main problems when establishing the current watershed governance framework for northern Saskatchewan is that participants would often find themselves unfamiliar with the broader definition of "governance". Even when provided with a definition of "governance", most (27% of the interviewees), answered that they "don't know" if there is currently a framework for watershed governance in northern Saskatchewan. An important aspect of governance is that it involves the collaboration and active participation of non-state actors within the decision-making process (Newman *et al*, 2004). "Not knowing" about the current structure is important to note because it is indirectly exposing the lack of participation and engagement in watershed related matters in the north.

Some participants explained that the administrative and planning structures for the north of the province were comparable to "extensions" of the current plans orchestrated for the south of the province. Yet some participants highlighted historical attempts of planning in the north.

For example, according to one participant, in the mid-1990s the Saskatchewan Ministry of the Environment set up integrated land-use plans on Crown land which looked at a number of natural resource issues including water. The reasoning behind these plans was to address residents' concerns with hydro development in northern watersheds. Yet, one government participant explained that these types of plans were performed on a project basis which would often dissolve after the plans had been executed: "[the planning committee] get together once a year or once every 5 years to update the plan, but there is no formal organization that exists after the plan. It's a "guidebook" for the Ministry of the Environment. Other than that, we haven't ventured into northern Saskatchewan."

The Heritage River Designation for the Churchill River was also repeated by some participants as the only past case of planning for the north. Throughout the 17th to the 19th century, the Churchill River was a major "voyageur route"; which brought both cultural and historical value to northern residents. The Heritage River Designation project started in 1992 and was set to be completed in 1997 (Government of Saskatchewan, 2007). According to a government official, the planning advisory committee for the designation of the Churchill River expressed their aversion to further hydro development; an issue that later became controversial with other industry players such as SaskPower. This opposition led to a suspension of further plans, of which to this day remain uncompleted.

According to the literature, for water governance to be "effective", a proper balance between political, social and economic organizations and institutions need to take place (Roger

& Hall, 2002). It is also stated that there is no single model for effective water governance as this system is seen to be unique to an area's social, economic and cultural particularities (Roger & Hall, 2002). Much of the literature characterizes water management in Canada as a system having poor inter-governmental coordination which often results in a duplication of efforts and inadequate data collection, sharing, monitoring and enforcement (Nowlan & Bakker, 2007; Norman *et al* 2010). The literature seems to be consistent with participant responses on the effectiveness of watershed governance in northern Saskatchewan, where most of the participants (56%) cited multiple reasons why the current model was ineffective.

One of the main reasons stated for the ineffectiveness of the current watershed governance framework was the lack of communication between actors. According to Tropp (2007), the process of networking and dialogue is critical to address issues of water governance and sustainability. Likewise, recent literature highlights the importance of "new forms of governance" which includes communication as a way to improve social coordination and as an avenue for problem resolution (Castells, 2008; Tropp, 2007).

The issue of insufficient dialogue between northern actors and agencies is also related to a disconnect with information reporting and administration; of which one non-governmental participant stated: "Other than the fact that we are very dependent on advice from reports, we don't see anything to make sure that the water is kept clean". This can be seen as a direct symptom of the current over-arching Canadian water governance framework, which as noted by de Loë & Kreutzwiser (2007:91) is conducting its own "largely independent, experiment in water governance".

Another reason provided for the ineffectiveness of this model is that the current watershed governance framework is not northern specific. Provincially, watershed management

planning efforts and resources are mostly utilized in the most populated southern parts of the province, where watersheds are substantially different both in ecology and in contamination sources. As mentioned by a non-government participant: "provincially and as a whole, we seem to be paying attention and we are certainly keeping pace with our counter parts in Alberta, in B.C. and in the NWT; but in the north we are not necessarily at the table dealing with the people that we need to be dealing with - and that's a problem".

Cohen & Davidson (2011:63) highlight this type of concern as a result of asymmetric gaps between 'Policy-sheds', where "unless all policy is made at a watershed scale (…) no single set of policies will ever wholly encompass the watershed". The overuse and underuse of capacity efforts in certain areas has also been attributed to the current water governance structure in Canada; of which the level of fragmentation was stated by Weibust (2009:120) as being "the main cause of Canada's poor environmental performance".

Yet even with the concerns of fragmentation and duplication addressed above, some participants have grown accustomed to this current framework and feel that the system is effective in addressing project-specific management; as seen by this industry participant:

> "I think there is always room for optimizing and reduction over-lap and duplication between provincial and federal governance strategies but it is effective from our perspective in terms that it allows us to go about our business in [a] sustainable manner despite some of the governance complexity we have grown to know. So we have grown to know the things we need to do to grow within that governance structure. It is always the unknown when governance structures are revised that there tends to be new and additional and unknown challenges that could arise that can be an encumbrance to moving forward."

The term "governance" with industry participants seemed to be measured through the ability to perform their projects and not necessarily as a tool of empowerment and civil participation in the governance process. Because of this interpretation, much of the dialogue on

effectiveness coming from industry participants focus on the issues within current jurisdictionally-based water management in the north.

5.1.1 Watershed Governance in Northern Saskatchewan: Concerns and Recommendations for Greater Effectiveness

As mentioned previously by a majority of the research participants, watershed governance in northern Saskatchewan is generally seen as ineffective. A parallel can be drawn between participants' general concerns with watershed governance in northern Saskatchewan and participants' suggestions to make watershed governance more effective. The following issues relating to dialogue and empowerment, consultation and Treaty rights, inconsistencies and capacity, will be discussed below.

Watershed planning and governance addresses the interrelationships central to water quality and quantity and community engagement (Duram & Brown, 1999). When addressing the issue of "dialogue" for northern Saskatchewan watershed governance, Inter-jurisdictional communication and inter-stakeholder relationships where both equality represented. The need for dialogue as an avenue for greater organization to mitigate future water issues was especially important; through which one non-government participant explained:

> "Governance has to be set up so that it's organized and consistent with connections with those communities so that everyone is on the same page, to manage for [our future and ongoing] water quality concerns".

Consistency in dialogue as a way to manage natural resource concerns, especially with regards to collaborative planning, has been discussed by Innes & Booher (2003). Innes & Booher (2003) explained that to achieve collaboration among stakeholders with differing interests and history, the use of dialogue is especially important. In this case, a stronger dialogue based

grounded on reciprocity, relationship building and active learning would be seen as a tool most needed for northern Saskatchewan governance (Innes & Booher, 2003:37).

However, an inevitable constraint to achieving greater and better dialogue amongst northern Saskatchewan watershed users lies in the issue of scale. Scholars who study large-scale collaborative efforts have noted that successful collaborations often emerge from salience of a common resource to local residents (Heikkila & Gerlak, 2005). Common concerns related to water quality, might have the potential to create a catalyst for the initiation of collaborative efforts leading to greater dialogue on watershed issues in northern Saskatchewan. However, Heikkila & Gerlak (2005) have also noted that other components, such as proper access to information and leadership have also been observed as key requirements to enable a collaborative-based dialogue (Heikkila & Gerlak, 2005). This might prove to be problematic for the current northern Saskatchewan watershed governance framework given that lack of access to information was mentioned by some participants as a deterrent to active participation.

Increased dialogue may also lead to increased participation. The increase in participation was stated throughout the interviews as a way to make watershed governance more effective. The current lack in participation was attributed to the complexity of the consultation process and to the idea that a majority of the public remain unaware of the programs that are in place to engage participation. Other responses included the creation of a stronger educational component within the current governance system where residents could find avenues for engagement; ideally grassroots in nature, created through local programs and groups. Recommendations also stated the need for more effective controls on communities and their environmental interactions, including suggestions that a heightened sense of public involvement and ownership with local watersheds would result in better environmental stewardship.

Participation has been defined as "a process in which individuals take part in decision making in the institutions, programs and environment that affects them" (Heller *et al*, 1984:339). An increase in participation as a way to generate effective watershed governance, align with the current literature on social benefits of participation in environmental decision making. As such, stakeholder participation has been argued as a way to increase public trust in decisions and as an empowerment tool through the co-generation of knowledge (Wallerstein, 1999; Richards *et al*, 2004). Fairness and equity are also major attributes to stakeholder participation which lead to the promotion of social-learning; one of the more pragmatic benefits of participation where stakeholders come together in the development of creative solution (Richards *et al*, 2004; Blackstock *et al*, 2007). Thus, it can be assumed that an increase in participation through effective dialogue and engagement is one of the first benchmarks in making watershed governance more effective in northern Saskatchewan.

Increased dialogue and participation can also address other major participant concerns of Treaty Rights and Aboriginal consultation. The issues relating to Treaty representation, Aboriginal consultation and water rights are not unique to northern Saskatchewan and arise from deeply engrained historical struggles faced by Indigenous communities across Canada (Asch, 1997; Slattery, 1982; Bakker & Cook, 2011).

Treaty Rights remain one of the main watershed governance concern for northern Saskatchewan, especially for some members of the Hatchet Lake community: "Our water rights in general are not well defined […] water should be included in the land. I came across an old [treaty] map where the water is included and I don't see that in the current mapping so there is a huge concern about that". This type of difficulty is pervasive across the country as there has never been a Canadian court ruling that has clearly established or denied Aboriginal rights to

water (Laidlaw & Passelac-Ross, 2010).

In the case of the Prairie Provinces, the provincial governments commonly asserted that "Indian water rights were abrogated by legislation" (Bartlett 1981:184). This legislation came about through the Northwest Irrigation Act of 1894 which passed during a time where Parliament still had legislative powers over the region (Notzke, 1994). This Act allotted all property and rights of use to the Crown which effectively rejected the idea that water was not to be the subject of ownership. Unfortunately, the Northwest Irrigation Act and its applicability to First Nations water rights has never been defined where AANDC failed to apply for water protection licenses on reserve land (Notzke, 1994).

Barlett (1981:50) suggests that the Aboriginal Title includes water rights but that such rights are likely limited to traditional uses only:

> "Water rights derived from treaty are in affliction to riparian rights – those rights to water which were recognized by the common law as a natural incident to the right to the soil itself. They are 'natural' rights derived from possession of land adjacent to water […] Treaty water rights are substantially broader than those derived from Indian ownership of riparian rights to land […] Riparian rights suffice to protect the traditional and domestic uses of water by Indian people".

The interviews in this research indicate that "traditional and domestic uses of the water" are not being adequately protected through riparian rights for the northern Indigenous population.

The Supreme Court of Canada describes the Aboriginal Title as exclusive use, occupation and possession right to "land". The question of Indigenous rights to waters and governmental claims to the extinguishment of these inherent rights have recently been revisited by Laidlaw & Passelac-Ross (2010). In this essay on water rights and water stewardship, Laidlaw & Passelac-Ross (2010) demonstrate through written provisions of the treaties and historical evidence of oral

promises made at the time of treaty-making, that "water" itself was not viewed as separate from the "land". This misinterpretation is an important theme recovered from observations at the Lac Brochet 2011 "Keepers of the Water Gathering V" and from interview participants, especially in Hatchet Lake, where as one community member stated: "we never gave away our rights to water".

Deeply rooted within the issue of Indigenous rights to water lies the ongoing struggle with the Crown's "duty to consult", a concern which surfaced on some occasions throughout the interviews. The duty to consult refers to the key considerations as to whether or not Aboriginal rights have been infringed upon. The process associated with this consultation is not only complicated but also a discussed topic in the academic realm (Bird, 2011; King, 2011); more specifically in *R. v. Sparrow* (1990) which has come to set the framework for the assessment of infringement (Natcher, 2001). As explained by Natcher (2001:114):

> "The framework established by the Supreme Court for assessing whether an action or regulation can justifiably infringe upon Aboriginal rights has become known as the ''Sparrow Test''. Specifically, the Sparrow Test sets out to establish if an Aboriginal right exists does the proposed activity interfere with that right being exercised. If so, is the infringement of that right justifiable owing to conservation concerns? If infringement was based upon conservation was priority returned to the Aboriginal resource users after such measures were taken? In the case of expropriation was there fair compensation? And finally, was a process of consultation undertaken with the affected Aboriginal communities prior to infringement?"

Lawrance & Macklem (2000) have argued that the primary reason for the failure in the duty to consult can be attributed to its widespread misunderstanding by parties, counsel and courts. More often than not, the "minimal accepted standard" of meaningful consultation is met, which inevitably leads to inadequacies in the consultation process (Lawrance & Macklem, 2000).

Although no specific examples of failures to address the duty to consult were provided for northern Saskatchewan, the interview participants stated their animosity towards the failure of this process.

Participation and dialogue involves the valorization of local knowledge and seeks to empower grassroots communities (Mohan, 2006). Creating an open learning-based dialogue using tools such as Traditional Ecological Knowledge (TEK) were mentioned by participants as imperative to promoting effective watershed governance in northern Saskatchewan. There are countless different definitions of TEK, yet many scholars believe that no true definition exists due to its inability to be fully extracted and analyzed from its holder without losing part of its meaning (Simpson, 2001; Gallagher, 2003). In the context of this research, Usher's (2000:185) definition of TEK will be used, where "TEK refers specifically to all types of knowledge about the environment derived from experience and traditions of a particular group of people".

The use of TEK within the context environmental decision-making raises questions about the dichotomy between 'experts and non-experts' and the way in which 'decision-makers' are defined by different groups (Mohan, 2006). Some academics believe that TEK can play a significant role in transparent decision-making but must remain sensitive to the contrast that it holds in comparison with western knowledge (Agrawal, 1995). According to Warren (1991), the primary difference between western knowledge and TEK lie in an "organic relationship" between the local community and its knowledge. Therefore, it can be assumed that TEK is of paramount significance for the creation of "cost-effective, participatory and sustainable development processes" (Agrawal, 1995:417).

In conjunction with the use of TEK, some participants noted that a stronger effort towards the inclusion of local languages (in this case, Cree, Dene and Saulteaux) needed to

surface in dialogue and participatory processes to improve northern watershed governance. Ellis (2005) discussed the importance of language in environmental planning in the NWT; where oral communication in traditional native languages is the norm. According to Ellis (2005), major problems arise because decisions are produced based upon Euro-Canadian value systems that are scientific in nature rather than traditional-knowledge which are often based on experience. The importance of language and TEK in environmental decision making is important because if it is not considered, it can limit the ability of TEK experts (often Elders) to contribute meaningfully (Ellis, 2005).

Clark *et al* (2006) has noted the importance of stakeholder participation as an avenue to foster salience, credibility and legitimacy. With this notion, Clark *et al* (2006) also emphasized the importance of capacity in order to increase the influence and to generate the production of proper environmental assessment processes (Clark *et al*, 2006). More and effective capacity was also recommended by research participants as a way to make watershed governance more effective. One government participant explained that financial capacity will need to be dedicated to the north in order to make the appropriate changes, facilitate northern engagement and to enable watershed groups to be recognized as legitimate entities.

These claims are consistent with previous academic studies which note the relationships between lack of financial capacity and the ability to promote stewardship (Timmer *et al*, 2007). The deterrents to increasing capacity and governmental capability to properly monitor environmental changes lie in the growing complexity of environmental conditions and financial cuts to environmental programs (Conrad & Daoust, 2008). These issues are not unique to northern Saskatchewan, but have been persistent across the country since the early 1990s (Henriques & Sadorsky, 2008). Cutbacks in funding for citizen participation and environmental

regulation have been attributed to a reduction in federal environmental spending by 32 percent over the period of 1995 to 1998; which have inevitably reduced capacity for monitoring, enforcement and funding (Paehlke, 2000).

The inconsistencies and unclear regulations found within the current northern watershed governance framework were also concerning for some participants. The major concerns from these participants included uncertainty with regulation on withdrawal from different water sources and volume (surface water versus ground water), regulatory legislation around chemistry of disposed water, water quality guidelines and, uncertainty regarding the functioning of the "Results-Based Regulatory Model". These concerns were mostly stated by industry participants who represent the largest users of groundwater in the province (R. Halliday & Associates, 2009).

The federal government issued the first water licenses in Saskatchewan in 1894 under the authority of the North-west Irrigation Act (Percy, 2012). These early licenses tended to be for irrigated agriculture and were handed-over to the province following the Resource Transfer Agreement in 1930 (Percy, 2012). In 2005, the Saskatchewan Watershed Authority Act established the SWA's mandate to manage, control and protect water resources, watersheds and related lands by regulating water development and water use. The main functions of the Ground Water Management Branch within the SWA are to regulate groundwater withdrawals and to provide groundwater information (SWA, 2010).

The major point of contention with regards to ground water withdrawal volume stems from the current water allocation framework, which allows for groundwater withdrawal licensing but lacks proper follow-up and monitoring. It comes as no surprise that the issue of ground water withdrawal volume comes at the forefront of industrial users' concerns; especially considering

the volume of water to run certain operations. This issue is highlighted in R. Halliday & Associates (2009:36):

> "Although water users are asked to report water withdrawals, the data on these withdrawals is incomplete. The only users reporting regularly are those industrial users who must pay water charges. There is no routine data on actual water consumption in the province. This situation tends to be the norm in Canada. There is some anecdotal and other evidence to support the contention that water withdrawals and hence water consumption in the province is less, in some cases much less, than the licensed allocation".

A second related concern is regulation and legislation around the allowable chemistry of disposed water. Currently, provincial pollution control regulations permit no discharge of effluent to receiving waters through the Environmental Management and Protection Act (2002). As it stands, for Saskatchewan industrial water users, a permit is required to discharge any substance that may cause adverse effects to water quality (EMPA, 2002). It is also prohibited to discharge a substance into the environment in an amount, concentration or at a rate of release causing an adverse effect unless otherwise expressly authorized by permit (Thompson, 2005).

Similarly to the above mentioned issues of water volume withdrawal, monitoring and enforcement have also become points of contention for non-governmental groups. In 2000, the Saskatchewan Eco Network's Water Working Group developed a project aiming to highlight the rural perspectives on water issues; the following statement was made regarding industrial water disposal:

> "There are regulations for production and waste handling; however inspection and enforcement have not kept pace with oil and gas development for several years. Little government staff time is devoted to inspection so regulators depend upon the public to report problems. As a result, many environmental violations go unreported and uncorrected" (SEN, 2000:5)

Unfortunately, there seems to be a lack of documentation on this matter, rendering further discussion problematic.

A last theme in this category can be associated with uncertainties regarding the new shift towards Results-Based Regulation. The Province is currently nearing the adoption of a Results-Based Regulation framework, which would include a Saskatchewan Environmental Code (SEC) as its core function (Saskatchewan Ministry of the Environment, 2009). Results-Based Regulation (RBR) focuses on environmental performance; where the regulator would specify the desired environmental outcomes and the industry would decide the best way to achieve them (Clifton Associates Ltd., 2009). As explained by a report presented to the Ministry of the Environment: "Industry is clearly accountable for compliance and it would be the role of MOE to assure the public that compliance is being achieved" (Clifton Associates Ltd., 2009:viii).

The core principles of this RBR system propose to resolve some of the issues addressed above, considerably, concerns of enforcement and monitoring. These principles include: legally enforceable, demanding standards that place continuous pressure on industry for continuous improvement; active enforcement to hold industry accountable for meeting the standards; and, transparency, particularly publishing of information to promote environmental progress (Clifton Associates Ltd., 2009).

5.2 Water Quality & Quantity Concerns for Northern Saskatchewan

The following section discusses research participants' water quality and quantity concerns for northern Saskatchewan. The main concerns discussed are: acid rain and environmental quality; treated effluent from industry and uranium contamination and; community-level understanding of water contamination.

The scale and growth of surface mining and development especially within the Alberta oil sands pose serious water use and management challenges in the prevention of significant environmental impact (Woynillowicz *et al*, 2005). What is of particular concern is the quantity of freshwater, both surface and groundwater, needed for bitumen extraction, which consequently impact water resources through muskeg and overburden drainage, aquifer dewatering and long-term management of tailings (Woynillowicz *et al* 2005). Some of these factors, including the lowering of the water table (mostly large water withdrawal from the Athabasca watershed) and the impacts of the Alberta oil sands on the acidification of water bodies were mentioned by research participants as a major concern for water quality and quantity in northern Saskatchewan.

According to the Environment Canada 2006 emissions inventory, more than 150,000 tons of sulphur dioxide emissions are released from the Alberta oilsands operations of which current estimates from the Pembina Foundation establish that 65-70% is carried into Saskatchewan (Prebble *et al*, 2009). The extent of damage caused by acid rain depends on the amount deposited and the sensitivity of the area which receives it (Environment Canada, 2010). In 2009, the Pembina Institute released a report in conjunction with the Saskatchewan Environmental Society and Canadian Parks and Wilderness Society which highlighted the extent of sensitivity of some northern Saskatchewan watersheds, especially within the Churchill watershed which has already reached a critical acidification tolerance point (Prebble *et al*, 2009). Accordingly, Aherene (2008) released a report for the Canadian Council of Ministers of the Environment which noted that northern Saskatchewan is the most acid sensitive region in Canada.

The 2011 Saskatchewan State of the Environment Report indicated that 68 percent of the 259 lakes in northwest Saskatchewan were classified as “sensitive” to “very sensitive” to acid deposition (Saskatchewan Environment, 2011). According to the original study by Scott *et al*

(2010), no lakes were acidic to the extent of having negative acid neutralizing capacities. Yet, another study by Jeffries *et al* (2010) modeled acid deposition for northern Saskatchewan and indicated that acidification risk may exist in some lakes. The final recommendations from Saskatchewan Environment include continued monitoring to interpret any changes in pH over time (Saskatchewan Environment, 2011).

Concerns with acidification of northern lakes were deemed important to the participants in this research. This could be attributed to a number of reasons, notably the lack of monitoring in the north, concerns with current oilsands development in northern Saskatchewan and immediate dependence on freshwater resources that some participants have through their livelihood.

Lack of water monitoring in the north was a predominant concern for research participants, especially when compounded with concerns of acidification in lakes. Although attempts at monitoring for pH have been sporadic in the past, as of 2007 Saskatchewan Environment started initiating regular sampling (Prebble *et al*, 2009). The north has been receiving more attention in the past year, with the launch of the Boreal Watershed Initiative which plans to "emphasize baseline and historical studies, utilizati[ze] traditional knowledge, legacy data and development of tools" (Government of Saskatchewan, 2012). This initiative plans to increase monitoring to evaluate future changes in northern watersheds and to ensure environmental protection of the region (Government of Saskatchewan, 2012). This sudden investment in northern watersheds demonstrates that the need for monitoring has been felt throughout the province, not necessarily only by northern stakeholders.

The estimated area for Saskatchewan oil sand potential is 27,000 square km (Government of Saskatchewan, 2011). Northern Saskatchewan's resource potential was thoroughly examined

during the Nineteenth Williston Basin Petroleum Conference (2011), through which it was explained that the existing oil shale and oil sands dispositions will be grandfathered under *The Oil Shale Regulations* [1964] while new oil sands and oil shale dispositions will be administered through the *Petroleum and Natural Gas Amendment* Regulations [2007] in which oil shale mineral rights will be available under the competitive bid and work commitment processes (Government of Saskatchewan, 2011ii). Excitement for oilsands development is being felt throughout the province as Alberta companies such as Oilsands Quest Inc. already holds permits to explore approximately 342,000 hectares and roads are being built to link projects in La Loche and Fort McMurray, Alberta (Government of Saskatchewan, 2005; Government of Saskatchewan, 2011ii).

Saskatchewan's oil sands operations aim to differ from conventional extraction methods due to its shallow *in situ* bitumen deposits. Some academics argue that this difference should enable new technologies to arise which would reduce and even replace the use of freshwater and reduce the amount of CO2 emissions (Schramm *et al* 2009). Yet a remaining majority of interest groups continue to urge the government to move forward with caution. As stated in a report by the Pembina Institute: "there is little evidence to date, at either the federal or provincial level, of the political will necessary to properly regulate potential oil sands development" (Prebble *et al*, 2009:27). Unfortunately, due to the rapid emergence of these projects, little academic evidence is available to further evaluate the above claims.

Fears from oil sands development in Indigenous communities are not unique to northern Saskatchewan but also strongly felt in Alberta, where concerns are centered on "water quality and quantity, loss of traditional ways of living and traditional knowledge, ability to consume country foods and lack of transparency in the way monitoring data is collected and

communicated" (Kelly *et al*, 2009). Research participants have expressed concerns regarding the health of the local biota in relation to oil sands development. Bitumen contains toxic chemicals which have caused deformities in fish in communities downstream from Fort McMurray (Schindler, 2010). Other research has also shown increased incidents of cancer in communities downstream from this type of industrial development (Chen, 2009). Hence, concerns for communities living downstream from oil sands development do not go unfounded, especially northern Indigenous communities who rely heavily on fish as a source of protein. As highlighted by a northern resident: "The people feel that there is always something contaminating the water […] There are things that have come up like minnows that are dead and floating and such".

Treatment of effluent and uranium contamination from industry was voiced as a water quality concern for the north. Canada holds the title of the second largest uranium producer in the world, responsible for approximately 20% of the world outputs (Canadian Nuclear Association, 2010). McArthur River in northern Saskatchewan represents the largest uranium producing region in the world (Northern Development Ministers' Forum, n.d.; Canadian Nuclear Association, 2010; World Nuclear Association, 2012). Yet, concerns of considerable environmental threats from mining and toxic waste by-products remain present.

In the early 1980s, rich uranium deposits were discovered on the eastern side of the province in Wollaston Lake. Today, the mining industry operates four uranium mines in northeastern Saskatchewan under two companies, Cameco and Cogema (Heber, 2005). The Cameco mines are located at Rabbit Lake, Cigar Lake and MacArthur River; Cogema operates a mine at Maclean Lake. Milling operations for processing ore are located at Rabbit Lake and Key Lake (Heber, 2005).

Indigenous participants in this study are residents from Hatchet Lake First Nation. Hatchet Lake is located 40km from Rabbit Lake where uranium operations initiated their activities in 1975 (Cameco, 2012i). Cameco Corporation was formed in 1988 from a merger of the federal Crown corporation, Eldorado Resources Ltd and the provincial Crown corporation, Saskatchewan Mining Development Corporation (Parsons & Barsi, 2001). Today, Cameco Corp. stands as the world's largest uranium producer (Cameco, 2012ii)

The Environmental Management and Protection Act (2002) and the Water Regulations (2002) govern industrial wastewater releases in Saskatchewan. Generally, a permit is required to construct or operate industrial effluent unless the industrial waste is discharged exclusively into sewage works operated by a municipality. As it stands, proposed projects may be required to undergo a formal environmental assessment (EA). The EA process identifies and assesses the potential impacts of a proposed project and develops measures to eliminate, minimize or manage those impacts (Government of Saskatchewan, 2007ii). Even with these safeguards, its been noted that Canadian mining industries have environmental liabilities that exceed $2billion for disposal, management and reclamation of mine wastes (Schneider, 2011).

The quantity of water used for the development and operations of active mines has increased slightly over the past several decades (Environment Canada, 2008). The peak concern arises from the total concentrations of contaminants discharged from mine sites which may occur many years after the onset of mining (Environment Canada, 2008). Environment Canada (2008)'s report, "Threats to Water Availability in Canada" noted that "because of the total volume of mine wastes and total number of mines growing, it can be expected that there will be an increase in the potential for contamination, an increase in the volume of water required for site management activities is also expected" (Environment Canada, 2008).

Many studies have already indicated the importance of effluent release in northern Saskatchewan waters; which have indicated higher levels of contamination, including certain trace metals in specific fragile arctic and subarctic fish populations (Trocki *et al*, 2004; Loppi *et al*, 2003; Pyle *et al*, 2002; Saric *et al*, 1995; Waite *et al*, 1990). Heber (2005) studied the impact of uranium mining in Dene communities in northern Saskatchewan. One of his main observations was northern concerns of fish population decline and a difference in fish taste which were attributed to uranium mining (Heber, 2005). Concerns with fish populations are also felt by Hatchet Lake community members, where all too often claims of fish deformities and changes in the local biota have been observed: "in the years back there was no problem with the water...as a kid, I used to go down at the shore and see all the fish in the clear water and now you don't see that anymore".

In 1986, the Human Resource Development Agreement was introduced into the provincial mining Surface Land Agreements (Parsons & Barsi, 2001). According to Parsons & Barsi (2001), "It was a co-operative approach between the mining companies and government to make specific long-term commitments to maximize their recruitment, hiring, and training, as well as the advancement of northern people at all skill levels in the mine operations". Provincial regulations have established that a 50% employment quota for northern residents for mines (Heber, 2005). Currently, Cameco sources half of its employment from local Indigenous residents and have implemented policies which permit northerners to share the benefits of development in the Athabasca Basin (Cameco, 2012ii). Hence, a dichotomy lies within northerners who are concerned with effluent and contamination from industrial mining while reaping social and economic benefits from these activities.

Finally, water contamination in northern Saskatchewan has also been observed from other sources, such as household wastes and local sewage issues. The importance of public understanding of water quality was an issue which was repeated throughout the interviews, important for all participant groups and, was especially concerning for Hatchet Lake First Nations residents. The examples repeated by multiple respondents were community members disposing of their household wastes in the lake and of nearby fuel storage leaching on the shores; which might be attributed to current waste management practices in First Nations communities.

Inadequately managed solid waste disposal sites are common sources of pollution in First Nations communities (Zadozewski *et al* 2011). First Nations communities are highly dependent on the health of the environment and the concerns of First Nations people with respect to the adverse effects of inadequate dump site locations, garbage burning, and poor waste management practices have increased over the years. As stated by Zadozewski *et al* (2011) "The historical poor management, monitoring and remediation of solid waste facilities across Canada's First Nations Communities and the lack of current resolve over this issue has left many First Nations people feeling the consequences of environmental pollution".

Zadozewski *et al* (2011) also noted that most First Nations communities do not consider a geological site selection process when selecting a community landfill; a process that is required under current national and provincial legislation for off-reserve communities. Furthermore, some community dump sites might be developed on unacceptable sites which may be more prone to leaching. Studies have also documented numerous instances of contamination where First Nations communities have located their community dump sites in areas near surface water features (Bharadwaj *et al*, 2006; Zadozewski *et al* 2011). Unfortunately, there seems to be a lack

of documentation on the current state of waste disposal practices for First Nations in northern Saskatchewan.

5.3 Northern Saskatchewan Watershed Council

The need for engagement and ownership of northern watershed activities is one of the most prevalent themes within this research. As mentioned through the "Keepers of the Water IV" resolutions and by a strong majority of research participants, major changes in our current water management schemes in northern Saskatchewan are needed. Watershed governance suggestions for effectiveness align with the need for a framework based on dialogue, inclusiveness and legitimacy. Similarly, conditional responses for the creation of a watershed council for northern Saskatchewan indicated that northern stakeholders would be in favor of a watershed council if it promises to bring forth tangible outcomes. The following section discusses the feasibility of a watershed council for northern Saskatchewan.

A majority of participants in this research (53%) support the idea of a watershed council; especially if it would address some of the previously mentioned governance issues such as representation. The idea of better "representation" as an offshoot in the creation of such a council is interesting for the following two reasons: 1) it implies that this council would address the needs of northern stakeholders and, 2) it coincides with the literature on collaborative resource management.

Cronin & Ostergren (2007:530) have studied collaborative management with Indigenous tribes in the United States and have observed that "tribal interests are best represented by their direct involvement rather than through federal, state, or municipal agents". The same study also mentions that "full representation" of stakeholders that are directly impacted by environmental

constraints create good collaborative watershed management and enhances participatory democracy (Cronin & Ostergren, 2007).

A large majority of the participants supporting the idea of a northern Saskatchewan watershed council were Hatchet Lake First Nation community members, which is the community that hosted the "Keepers of the Water IV" gathering:

> "The local people in Wollaston should be managing the water […] I think it's best to watch that nothing bad happens […] I would feel better knowing that one of our locals were working for the water and concerns would be addressed".

The main issues arise in gaining the appropriate level of representation. Margerum (2006:147) studied representation of various groups in local collaborative management schemes and noted that: "many of these groups are formed under a range of rules and procedures, and individual committees may or may not achieve the breadth of representation advocated in the literature". Some examples include rural Australian groups having weak or nonexistent representation of environmental and Indigenous interests (Lane, 1997). Hence, appropriate representation can almost be seen as a constraint because in order to achieve "authentic collaboration", a cross section of interests and concerns are required (Cronin & Ostergren, 2007).

As explained by Trachtenberg *et al* (2005:60): "representation is important to collaboration because it helps collaborative institutions take account of the beliefs and interest of those their decisions will affect". Another key challenge to recognize in collaborative governance is that some groups are likely to be more economically or politically powerful than others (Trachtenberg *et al*, 2005). An example from The Fraser Basin Council provided that the 8 directors from the First Nations could not address all the concerns from the 90 separate Bands which occupy the basin. First Nations representation was established as the top priority group to be included in a northern Saskatchewan watershed council; followed closely by governmental

agencies and non-governmental organizations. The support for the creation of a watershed council for northern Saskatchewan was originally recommended through Keepers of the Water, which is an Indigenous led organization; hence it is only logical to see First Nations wanting to be adequately represented within its framework.

One of the assumptions of collaborative management, such as watershed councils, is that it requires a locally based approach (Margerum, 2006). While the literature highlights that collaborative efforts are often based at a local level (Conley & Moote, 2003), other examples also show differences in scale, including metropolitan regions and river basins (Heikkila & Gerlak, 2005). Consequently, imagining a watershed council for northern Saskatchewan requires us to think differently about collaborative arrangements at different scales: one that is not only bound by localism but also recognized and operated at a range of levels, notably institutions.

The concept of institution is relevant to this study because collaboration can occur at several different institutional levels. As explained by Margerum (2006):

> "At each level people can create structures and procedures for sharing information and making joint decisions…Watershed councils can be seen as an example of an institutional change at the action level that creates new positions for stakeholders, new procedures for sharing information (e.g., monthly meetings), and new rules for joint decision making (e.g., decisions by consensus)".

Creating a watershed council which amounts to tangible outcomes was mentioned as a second theme for research participants. In many instances, successful watershed council initiatives have enabled significant improvements to aquatic and terrestrial habitats, while engaging the local community in developing a sense of ownership in watershed issues (Lurie & Hubbard, 2008). However, some watershed initiatives do struggle with issues of capacity and legitimacy. In a report evaluating Oregon's watershed council groups, it was observed that a community's view on why watershed councils exist can affect initiatives' achievement potential

(Lurie & Hubbard, 2008). The recommendations for governmental agencies to be part of a northern Saskatchewan watershed council can demonstrate the importance of integrating "legitimacy" to this council's operations.

This statement also highlights the issue of capacity for northern Saskatchewan to support a watershed council. Smith & Gilden (2002) highlighted "Seven Asset Categories" which were deemed important for watershed councils in Oregon, which are: leadership, vision, trust, social networks, capital, power and local and technical knowledge. Lurie & Hibbard (2008) also evaluated watershed councils in Oregon and indicated that the biggest struggles for these organizations were financial resources, physical resources, human and technical resources, temporal resources, legitimacy and networking capacity. It is important to note that some of these issues relating to capacity might be transferable to northern Saskatchewan, such as explained by one governmental representative:

> "Our agency in terms of long term and guaranteed funding rather than the come and go funding that is on an annual basis, which you can't do much planning when there is financial uncertainty, but there needs to be a recognition that a guarantee of central funding should be available to support these long term initiatives and efforts for long term commitment".

According to the research participants, most of the capacity challenges for the initiation of a northern Saskatchewan watershed council can be categorized through de Loë & Plummer (2010)'s capacity challenges for decentralized watershed governance and have been revealed in the form of technical capacity, through the existence and retention of technical expertise; human capacity, through the already small and isolated northern population; social cognitive capacity, through bridging the divide between governments and northern stakeholders while achieving cross-organizational sharing; institutional capacity, through establishing coordination between all northern organizations and stakeholders, and; financial capacity, through the operational costs

associated with a project of this magnitude. Potential capacity issues which might be revealed through the creation of such a project are already present in some northern communities as some communities lack the technical and scientific capacity to insure ongoing training for their water treatment operators. As explained by one industry participant:

> "When it comes to specific communities managing their own drinking water, to do it properly there needs to be lots of training and proper facilities put in place so that training capacity is for sure an issue. That is a huge responsibly looking after a water treatment plant for instance, and it should be a responsibility in the hands of someone that lives there not have someone come in and do it […] so the training capacity needs to build up in some cases".

Achieving tangible outcomes largely depends on the goals and interests of the person evaluating these outcomes (Conley & Moote, 2003). Conley & Moote (2003) explain that it is typical in the evaluation of collaborative resource management initiatives, that evaluation often focuses on the characteristics of a process, which embrace inclusiveness or representation and decision-making methods or outcomes. Originally, collaborative resource efforts were evaluated based on whether they resulted in "cheaper, faster, fairer, more innovative, and longer lasting agreements than those achieved through litigation" (Sipe, 1998). Current shifts in collaborative natural resource management seem to focus on social outcomes, such as relationship building as an evaluation criteria (Schusler, 2003); yet some scholars argue that the improvement of environmental conditions remain the dominant measure of success (Koontz & Thomas, 2006). Hence, it will be challenging to measure the "tangible outcomes" that a northern Saskatchewan watershed council might provide, as little to no baseline data has been produced for most northern Saskatchewan watersheds.

Although most of the research participants in this study support the idea of a watershed council for northern Saskatchewan, there still exists a certain level of skepticism regarding the

roles and responsibilities and the overall functioning structure of this initiative. These reservations do not go unfounded as watershed council structures are tailored to address the specific needs of a region which makes its framework unique in every scenario.

Choosing an appropriate framework for a northern Saskatchewan watershed council will provide numerous challenges. Apart from the challenges faced by other councils such as funding and legitimacy, the issue of scale becomes prominent. As mentioned by a government interviewee in our research:

> "Yes [a watershed council is], a good idea. I'm not sure that an overarching council would be ideal due to the different watersheds. But if there is a council to keep all the different groups together with a good structure it would be great".

Lee and Stankey (1992) refer to this problem as a paradox of scale. As explained by Cheng & Daniels (2005:31):

> "On the one hand, the geographic scale should be large enough to truly address systemic problems, such as endangered species conservation and water quality. On the other hand, the geographic scale should be sufficiently small to accommodate the participation and active involvement of diverse stakeholders throughout the watershed".

According to Thomas (1999), large-scale watershed planning efforts have the tendency to alienate stakeholders from each other; whereas the creation of smaller-scale sub-basin groups tends to lead to more tangible and comprehensible goals. Cheng & Daniels (2005) examined the issue of scale in collaborative planning initiatives in Oregon and found that the choice of scale at which watershed planning occurs can strongly influence the kind of process stakeholders want. According to this study, stakeholders felt a heightened sense of identification with their watersheds in small geographic planning areas. Smaller initiatives also led to stronger mutually-agreed upon decisions and actions. Larger planning initiatives led to greater knowledge of

regional environmental issues, but based their interactions through the organizational structure rather than at the community level (Cheng & Daniels, 2005).

Bentrup (2001:740) evaluated the structure of three watershed groups in the western United States, where he noted that "while a formal organization may be necessary, a bureaucratic structure should possibly be avoided because many steps in collaborative planning may not thrive in a rigid organization". Bentrup (2001) suggested that the use of subgroups within a nonhierarchical framework provides an adequate amount of structure to facilitate tasks efficiently. The use of subgroups in a possible framework for a northern Saskatchewan watershed council could be beneficial given the scale of the region and the multiple players wanting a voice in northern watershed issues. Smith & Gilden (2003) also performed an evaluation of watershed council structures in Oregon, and found that all watershed groups differed from each other significantly, but all had leadership (such as a main coordinator), a board which held regular meetings and a vision statement (Smith & Gilden, 2003).

Another issue seen as problematic in the creation of a watershed council is the numerous different agencies that play a role in water issues in northern Saskatchewan. Some academics assert that collaborative partnerships consume excessive amounts of time and effort, create new and unnecessary layers of bureaucracy and divert attention away from important problems (Kenney, 2000). Some have even stated that these initiatives "give false legitimacy to parochial deliberations when regional or national interests are at stake, and reward government agencies for making popular decisions rather than sound decisions" (Coggins, 1999). Moreover, one industry participant indicated their opposition to a watershed council, stating that governmental mechanisms were already in place to address the issue of northern governance:

> "I think that the SWA can do this [northern watershed governance] without any other involvement from other people. They have the know-how, the staff the data, the money. They have the connections with inter-provincial agencies that would help makes those decisions. They do watershed management plans".

This view was consistent with other participants who expressed reluctance in bringing yet another layer to the already confusing northern Saskatchewan watershed governance framework

Suggestions of other actors such as non-governmental organizations, northern communities and industry garner the importance of integrating "inclusiveness" in designing a framework for a northern Saskatchewan watershed council. The inclusion of various actors within a watershed council framework is seen as a major strength (Clark, 2008). Some academics argue that the complicated relationship between water users is imperative to initiate collaborative planning (Cronin & Ostergren, 2007). Huntington & Sommarstrom (2000) conducted an analysis of relationships between the conservation effectiveness and organizational attributes of watershed councils in the United States and discovered that in most cases, relationships between watershed councils and governmental agencies have improved over the years. Although a watershed council might bring forth yet another northern actor; it holds the potential to improve the existing relationships between northern stakeholders by creating an avenue for discussion and communication.

In summary, the ineffectiveness of the northern Saskatchewan watershed governance framework can be attributed to larger water governance issues which are pervasive at a national level. Both participants and the literature have stressed that an increase in dialogue and participation would aid in creating a more effective governance framework. While water quality and quantity issues are notorious of Canadian northern regions they can also be reflected as symptoms of uranium legacy issues, the current regulatory framework and the lack of monitoring in northern watersheds. A watershed council has the potential to engage northerners in dialogue,

partnership and participation but will have to be carefully actualized in consequence of scale, and legitimacy.

CHAPTER 6
CONCLUSION

6.1 Research Contributions

The goal of this research was to identify the institutional arrangements and capacity-building requirements necessary to support watershed governance in northern Saskatchewan. There is a growing body of work in the field of water governance in Canada (Norman *et al*. 2008; Bakker, 2007i; Bakker, 2007ii, Bakker & Cook, 2011), Indigenous water governance (Jackson & Altman, 2009; Garande & Dagg, 2005; Perreault, 2005) and, decentralized water governance systems, such as watershed councils (Harbon, 2003; Flitcroft *et al*, 2009; Hardy & Koontz, 2010). Similarly, recent discourses in watershed governance at a decentralized level for northern Canada have been gaining importance in academic literature (Robbins, 2009; Nowlan & Bakker, 2010). This study directly addresses issues of water governance in Canada and should provide insight on these issues to academics and watershed resources planners. Additionally, this research will help to address the literature gap in watershed governance specific to northern Saskatchewan. Overall, this research provides an investigation of water quality and quantity concerns while analyzing the effectiveness of the northern Saskatchewan watershed governance framework. More specifically, this research examines the need and feasibility of initiating a northern Saskatchewan watershed council and how it might interface with other existing governance structures in the north of this province.

Some participants have expressed a strong interest in this research and it is anticipated that the organizations, agencies and individuals that will benefit the most from it will be the Keepers of the Water, the Prince Albert Grand Council, the Saskatchewan Watershed Authority and the communities of northern Saskatchewan. The results of this study will be shared with the Prince

Albert Grand Council and Keepers of the Water during the "Keepers of the Water VI" in September 2012. Academic presentations will also enable knowledge transfer in events such as the Prairie Division of the Canadian Association of Geographers 2012. It is anticipated that the results of this thesis will be published in academic journals such as the Canadian Geographer. The lessons learned as well as limitations and future research will be discussed below.

6.2 Lessons Learned

This thesis revealed several important aspects of watershed governance in northern Saskatchewan, water quality and quality concerns for northern Saskatchewan, and the support for a northern Saskatchewan watershed council.

First, the results demonstrate that most northerners are unaware of the current watershed governance structure in Saskatchewan, and are unfamiliar with its functions. Hence, a large portion of participants stated that there was currently no watershed governance framework for northern Saskatchewan. In reality, the watershed governance framework for the north is an extension of the southern governance framework, which is problematic to some participants who note that "it is not northern specific".

Secondly, most of the participants believe that the current watershed governance framework is ineffective due to insufficient dialogue, poor representation of Treaty rights and regulation inconsistencies. Similarly, recommendations to make watershed governance more effective include more and better consultation with Indigenous residents, resident ownership, involvement and engagement and, more and better funding and monitoring. The themes relating to consultation, dialogue and Treaty rights can be attributed to the complexity of the current consultation process and the ongoing struggle for water rights faced by Indigenous communities

across Canada (Asch, 1997). The theme of inconsistent regulation includes regulation of source and volume of underground water. Regulation inconsistencies are fundamentally an issue of creating clear guidelines, which include proper follow-up and monitoring. Increased funding to promote watershed activities such as monitoring was also suggested as a way to make watershed governance more effective.

Thirdly, dominant themes in water quality and quantity concerns for northern Saskatchewan include acid rain, community-level contamination and industrial pollution. These concerns are consistent through the literature which indicates the north as an acid sensitive region (Jeffries *et al* , 2010), unclear guidelines regarding solid waste disposal in First Nations (Zadozewski *et al* 2011) and, northern watersheds' sensitivity to industrial contamination (Trocki *et al*, 2004). Yet, it is important to note that these concerns can also be validated through the weak monitoring practices found in northern watersheds; which when they occur, are not necessarily shared with northern residents.

Finally, participant responses reveal a trend for the support of a northern Saskatchewan watershed council and can be seen as a way to increase dialogue, engagement and participation in northern watershed governance. The trend for a watershed council also indicates that First Nations, government and non-governmental organizations would act as the framework's main operating body. Yet, a certain level of skepticism can be observed from participant responses, as the coordination of northern actors, the separation of tasks and the framework associated with the formation of such a council will require careful planning.

6.3 Recommendations

This thesis represents the first study devoted entirely to the question of watershed governance in northern Saskatchewan. Due to scale and the geographical area in which this study took place, further studies are needed in order to understand watershed governance issues at a more localized scale. The following recommendations can be made to improve watershed governance in northern Saskatchewan.

Most of the participants in this study were unfamiliar with the watershed governance structure in northern Saskatchewan. A stronger educational outreach effort on behalf of the SWA, non-governmental organizations, industry and other northern actors and organizations should be made in order to inform northern residents on the activities and programs within their watersheds. Outreach and education could take the form of community visits and events, memos and radio broadcasts and/or school programs. This would not only generate understanding of SWA planning process but would also fortify community understanding of water issues and create a stronger link between northern residents and the impact of their activities within their watersheds.

A large majority of participants in this study also indicated that more and better consultation is needed in order to make watershed governance more effective in northern Saskatchewan. Specific attention should be made to address the issue of consultation in northern Saskatchewan, in particular with regards to the inclusion of local languages prior to consultation (with the use of written memos, radio broadcasts and community visits), during consultation (with the use of a translator) and after consultation (using proper follow-up in the local language). Attention should also be made to the use of different tools such as a stronger component of TEK within consultation periods. In addition to using local language, this could be

achieved through the use of proper forums to include Elder participation. Although this recommendation would not fully address concerns with Treaty Rights, it would help generate a stronger sense of participation, understanding and dialogue between northern communities and the province.

Some participants highlighted concerns with inconsistencies and unclear regulation regarding groundwater withdrawals. In order to address this issue, clear guidelines on allowable volumes of groundwater withdrawal, along with proper follow-up measures which includes monitoring and assessment of ground water volumes and flows should be mandated for the entirety of the province. This recommendation would also require proper groundwater mapping for the north of the province. Partnerships between the Province (through knowledge, capacity and legislation) and academia (through capacity and research) could be made in order to properly address this recommendation.

Many participants have indicated water contamination concerns for northern watersheds. A stronger effort on behalf of the SWA to administer monitoring practices in northern Saskatchewan watersheds would alleviate local concerns of acidification, industrial effluent contamination and other contamination concerns. The results of this monitoring should be made available to the public through a variety of outlets such as in person through regular community updates and accessible on the Internet. Sharing monitoring information with the public will also help northerners understand the state of their watersheds.

The majority of participants supported the creation of a northern Saskatchewan watershed council. A northern Saskatchewan watershed council would help in generating increased dialogue while creating a stronger sense of ownership and engagement in northern watershed issues. According to the participants, a northern watershed council should have an Indigenous-

led framework with an active role from the province, industry and non-governmental organizations. A watershed council could also create an avenue for greater local participation in northern watershed issues, address issues of social capacity and will help generate environmental stewardship and education, but will require effective coordination, sufficient capacity and diligent organization on behalf of northern communities.

Finally, the participants in this research indicated that social capacity, technical capacity, institutional capacity, economic capacity and, human capacity were all valuable in order to promote good watershed governance for northern Saskatchewan. These capacity needs are also important in supporting a northern Saskatchewan watershed council. Recommendations to address these capacity needs include establishing a SWA office in the north which deals with specific northern watershed issues. The presence of SWA in the north will help to alleviate concerns associated with scientific capacity and institutional capacity.

6.4 Research Limitations

Although this research has been successful in identifying the current watershed governance structure, water governance and water quantity and quality concerns as well as support for a northern Saskatchewan watershed council, some limitations have surfaced throughout the course of the research process. First, the expansive geographical scale which is northern Saskatchewan posed a challenge in collecting information from various stakeholders who may possess valuable information on northern Saskatchewan watershed governance. While a total of 30 interviews were conducted, it only represents a small sample of the population who have a stake in northern watershed issues; hence not all perspectives could be collected. For instance, an input from federal representatives such as AANDC and the Department of Fisheries and Oceans could have provided governance perspectives otherwise missed in this research. Other key interviews that

could bring strength to this research would be a representative from the Yukon River Inter-Tribal Watershed Council (YRITWC). Perspective with a member from the YRITWC would highlight an example of a functioning watershed council framework, involving many northern actors and tackling trans-boundary issues.

Additionally, this study would have benefited from conducting additional interviews in other northern communities. Building trust and networking with northern Indigenous communities takes time as most communities demand an external intermediary actor to allow research within the community. I regretted not having enough time to forge relationships with other northern Indigenous communities. Due to time constraints, I was only capable of retrieving the opinions of one northern community, Hatchet Lake First Nation. Community members from Hatchet Lake First Nation hold strong opinions on specific water quality issues and incorporating views from other northern communities would have strongly diversified the results.

Other limitations of the interviews include the language used when speaking with some participants. For example, when addressing certain community members in Hatchet Lake First Nation, it was important to rephrase questions in order to restructure the interview into an informal conversation. This was especially important when addressing Elders and community members who required the use of a translator. The use of appropriate wording when speaking with specific populations could have altered some of the responses.

6.5 Future Research

Northern Saskatchewan is a large area, and the ecology of its watersheds are as diverse as the communities that live within them. Taking the time to interview more of Saskatchewan's northern communities would bring forth valuable opinions on watershed governance in the

region. These communities also face different issues and concerns with regards to water quality and quantity and would help further our knowledge base of northern Saskatchewan watersheds.

The overwhelming drive and passion expressed by some of the participants in this study demonstrate that northerners want to create an avenue for greater dialogue on water issues. A northern Saskatchewan watershed council would act as a tool to empower northern communities in creating long-lasting relationships with the environment and water resources. Yet, the question of community empowerment and the tools needed to drive a large-scale decentralized water governance scheme may be worthwhile to explore in further detail.

CHAPTER 7
REFERENCES

Aboriginal Affairs and Northern Development Canada (2002) *National Assessment of Water and Wastewater Systems in First Nations communities Summary Report*, Ottawa, February 2003. Retrieved from http://www.aadnc-aandc.gc.ca/eng/1100100034982 On 05.02.12

Aboriginal Affairs and Northern Development Canada (2006) "Report of the Expert Panel on Safe Drinking Water for First Nations" (79 pages). Ottawa.

Aboriginal Affairs and Northern Development Canada (2008) "Summative Evaluation of the First Nations Water Management Strategy" Retrieved from http://www.ainc-inac.gc.ca/ai/arp/aev/pubs/ev/efnw08/efnw08-eng.asp#sub4_2. On 05.02.12

Aboriginal Affairs and Northern Development Canada (2010) "Highlights from the Report of the Royal Commission on Aboriginal Peoples" retrieved from: http://www.aadnc-aandc.gc.ca/eng/1100100014597 on 05.05.12

Agrawal, A. (1995) Dismantling the Divide Between Indigenous and Scientific Knowledge, *Development and Change* 26:413-439

Aherene, J. (2008) Critical Load Exceedance Estimates for Upland Forest Soils in Manitoba and Saskatchewan: Comparing Exceedance under Multiple Deposition Fields. Final Report (Canadian Council of Ministers of the Environment, 2008),

Allan, C., Curtis, A., Stankey, G., & Shindler, B. (2008). Adaptive Management and Watersheds: A Social Science Perspective 1. *JAWRA Journal of the American Water Resources Association*, *44*(1), 166-174. doi: 10.1111/j.1752-1688.2007.00145.x.

Armitage, D.R., Plummer, R., Berkes, F., Arthur, R., Charles, A.T., Davidson-Hunt, I.J., Doubleday, N.C., Johnson, D.S., Marschke, M., McConney, P., Pinkerton, E.W., Wollenberg, E.K. (2009) Adaptive co-management for social-ecological complexity, *Front Ecological Environment*; 7(2): 95-102 doi:10.1890/070089

Asch, M. "Aboriginal and Treaty Rights in Canada", UBC Press 1997 Print.

Auditor General of Canada (2006) *Report of the Auditor General of Canada. Ottawa: Public Works. Commissioner of the Environment and Sustainable Development. Report of the Commissioner of the Environment and Sustainable Development to the House of Commons*. Ottawa: Public Works and Government Services Canada.

Bakker, K. & Cook, C. (2011) Water Governance in Canada: Innovation and Fragmentation, *International Journal of Water Resources Development* 27(2):275-289

Bakker, K. (2007i) New Land Use Restrictions to Protect Water Security, *UBC Reports* 53(1) retrieved from: http://www.publicaffairs.ubc.ca/ubcreports/2007/07jan04/water.html on 05.05.12

Bakker, K., ed. (2007ii) *Eau Canada: The Future of Canada's Water.* Vancouver, BC: UBC Press

Bartlett, R.H. (1981) Indian and Native Rights in Uranium Development in Northern Saskatchewan *Law Review* 45(1):14-29Bell, C. (1990) Reconciling Powers and Duties: A comment on HORSEMAN, SIOUI and SPARROW, *Constitutional Forum* 2(1)

Bentrup, G. (2001) Evaluation of a Collaborative Model: A Case Study

Bharadwaj L, Nilson S, Judd-Henrey I, Ouellette G, Parenteau L, Tournier C, Watson D, Bear D, Ledoux G, Bear A.(2006) Waste disposal in first-nations communities: the issues and steps toward the future, *Journal of Environmental Health* 68(7):35-9

Bird, B. (2011) Federal Power and Federal Duty: Reconciling Section 91(24) and 35(1) of the Canadian Constitution*, Appeal* 16(3)

Blackstock, K.L., Kelly, G.J., Horsey, B.L. (2007) Developing and applying a framework to evaluate participatory research for sustainability, *Ecological Economics* 60(4):726-742

Booth, A.L. (1998) Putting "forestry" and "community" into First Nations' resource management, *The Forestry Chronicles* 74(3): 347-352, 10.5558/tfc74347-3

Bouwen, R. and Taillieu, T. (2004), Multi-party collaboration as social learning for interdependence: developing relational knowing for sustainable natural resource management. J. Community. Appl. Soc. Psychol., 14: 137–153. doi: 10.1002/casp.777

Boyd, D. (2011) The Right to Water: A Briefing Note, *International Action Council*, The Global Water Crisis: Addressing an Urgent Security Issue, March 21-23 2011, Toronto Canada (12 pages)

Bradshaw, B. (2003) Questioning the credibility and capacity of community-based resource management. *The Canadian Geographer* 47(2): 137-150

Brands, O.M. (2005) At a Watershed: Ecological Governance and Sustainable Water Management in Canada, *Journal of Environmental Law & Practice,* 16(1): 79-97

Cameco (2012i) "Rabbit Lake", Mining. Retrieved from: http://www.cameco.com/mining/rabbit_lake/ on 02.05.12

Cameco (2012ii) "Cameco in the North" Northern Saskatchewan. Retrieved from: http://www.cameco.com/northernsk/cameco_in_north/ on 05.02.12

Canadian Nuclear Association (2010) "Uranium Mining in Northern Saskatchewan" retrieved from: http://www.cna.ca/curriculum/cna_can_nuc_hist/uranium_sask-

eng.asp?bc=Uranium%20Mining%20in%20Northern%20Saskatchewan&pid=Uranium%20Mining%20in%20Northern%20Saskatchewan on 02.05.12

Castells, M. (2008) *The New Public Sphere: Global Civil Society, Communication Networks, and Global Governance*, the Annals of the American Academy of Political and Social Sciences, 616(1): 78-93

Chen Y (2009) Cancer Incidence in Fort Chipewyan, Alberta 1995–2006 (Alberta Cancer Board, Division of Population Health and Information Surveillance, Alberta Health Services).

Cheng, A.S. & Daniels, S.E. (2005) Getting to "We": Examining the Relationship between Geographic Scale and In group Emergence in Collaborative Watershed Planning, *Human Ecology Review* 12(1):30-43

Cherney, D. Kurauchi, Y., McIntosh, A. & Mortimer, K. (2010) "Large Scale Conservation in the Connecticut River Watershed: Moving from Competition/Fragmentation to Collaboration/Integration. In Large Scale Conservation: Integrating Science, Management, and Policy in the Common Interest edited by Clark, S.G., Picard, C. & Newsome, D. Yale School of Forestry & Environment (242 pages)

Clark, W.C., Mitchell, R.B., Cash, D.W. (2006) Evaluating the Influence of Global Environmental Assessments, in: Global Environmental Assessments: Information and Influence. Editors: Mitchell, R.B., Clark, W.C., Cash, D.W. & Dickson, N.M. MIT Press 1-28

Clifton Associates Ldt. (2009) "Towards a Results-Based Regulatory System" Report for the Ministry of the Environment; Saskatchewan Ministry of the Environment, Regina, SK. File # R4143.6

Coggins, G. C. (1999). Regulating federal natural resources: a summary case against devolved collaboration. *Ecology Law Quarterly*,25, 602-610.

Cohen, A., and S. Davidson. 2011. The watershed approach: Challenges, antecedents, and the transition from technical tool to governance unit. Water Alternatives 4 (1):1-14.

Commissioner of the Environment and Sustainable Development (2005) *Report of the Commissioner of the Environment and Sustainable Development to the House of Commons*. Ottawa: Public Works and Government Services Canada, Chapter 5, p. 26.

Conley, A. & Moote, M.A. (2003) Evaluating Collaborative Natural Resource Management, *Society & Natural Resources: An International Journal*, 16:5, 371-386

Conrad, C.T. & Daoust, T. (2008) Community-Based Monitoring Frameworks: Increasing the Effectiveness of Environmental Stewardship, *Environmental Management* 41:358-366

Cornell, S. and Kalt, J. P. (1992) *Reloading the Dice: Improving the Chances for Economic Development on American Indian Reservations,* Harvard Project on American Indian Development, John F. Kennedy School of Government, Harvard University

Cronin A.E. & Ostergren, D.M. (2007): Democracy, Participation, and Native American Tribes in Collaborative Watershed Management, *Society & Natural Resources: An International Journal*, 20:6, 527-542

Curtis, A., Shindler, B., Wright, A. (2002) Sustaining Local Watershed Initiatives: Lessons from Landcare and Watershed Councils, *Journal of the American Water Resources* Association 38(5) American Water Resources Association

de Loë, R., and R. Kreutzwiser (2007) Challenging the status quo: The evolution of water governance in Canada. In Eau Canada: The Future of Canada's Water, ed. K. Bakker,85-103. Vancouver, BC: UBC Press. Desapriya, E., Fujiwara, T., Verma, P., Babul, S. & Pike, I (2011) Comparison of On-Reserve Road Versus Off-Reserve Road Motor Vehicle Crashes in Saskatchewan, Canada A Case Control Study, *Asia Pacific Journal of Public Health* 23(6): 1005-1020

de Loë, R.C., Di Giantomasso, S., and Kreutzwiser, R. (2002). Local Capacity for Groundwater Protection in Ontario. *Environmental Management*, 29(2): 217-233

de Loë, R.C., Varghese, J., Ferreyra, C., & Kreutzwiser, R. (2007) "Water Allocation and Water Security in Canada: Initiating a Policy Dialogue for the 21st Century" Prepared for the Walter and Duncan Gordon Foundation; Guelph Water Management Group, University of Guelph

de Loë, R. & Plummer, R. (2010) "Climate Change, Adaptive Capacity, and Governance for Drinking Water in Canada" ED D. Armitage and R. Plummer , Adaptive Capacity and Environmental Governance, Springer Series on Environmental Management, DOI 10.1007/978-3-642-12194-4_8, # Springer-Verlag Berlin Heidelberg

Desapriya, E., Fujiwara, T., Verma, P., Babul, S. & I. Pike (2011) "Comparison of On-Reserve Road Versus Off-Reserve Road Motor Vehicle Crashes in Saskatchewan, Canada A Case Control Study", Asia Pacific Journal of Public Health 23(6): 1005-1020

Dhillon, C. (2010). Environmental Racism and First Nations: A Call for Socially Just Public Policy Development . *Canadian Journal of Humanities and Social Sciences, 1*(1). Retrieved from http://cjhss.org/_cjhss/pubData/v_1/i_1/20100602-1/20100602-1.html.

Duram, L.A. & Brown, K.G. (1999) Insights and Applications Assessing Public Participation in US Watershed Planning Initiatives, *Society and Natural Resources: An International* Journal 12(5):455-467

Eggertson, L. (2008) Investigative report: 1766 boil-water advisories now in place across Canada, *CMAJ* 178 (10) doi:10.1503/cmaj.080525

Ellis, S.C., 2005. Meaningful Consideration ? A Review of Traditional Knowledge in Environmental Decision Making. , 58(1), p.66-77.

Environment Canada (2006) "2006 Air Pollutant Emissions for Canada"; "Air Pollutant Emissions" retrieved from: http://www.ec.gc.ca/pdb/websol/emissions/2006/2006_canada_e.cfm on 02.05.12

Environment Canada (2008) “Threats to Water Availability in Canada” retrieved from: http://www.ec.gc.ca/inre-nwri/default.asp?lang=En&n=0CD66675-1&offset=10&toc=show on 02.05.12

Environment Canada (2010) “Acid Rain FAQ” – “Pollution Issues” retrieved from: http://www.ec.gc.ca/air/default.asp?lang=En&n=7E5E9F00-1 on 02.05.12

Environment Canada (2012) “Water – Frequently Asked Questions” retrieved from: http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=1C100657-1 on 02.05.12

Environmental and Management Protection Act, the (EMPA) (2002) Chapter E-10.21 of The Statutes of Saskatchewan, 2002 (effective October 1, 2002) as amended by the Statutes of Saskatchewan, 2003, c.29; 2004, c.L-16.1; 2005, c.S-35.03; and 2007, c.13.

Ferreyra, C., de Loë, R.C., Kreutzwiser, R.D. (2008). Imagined Communities, Contested Watersheds: Challenges to Integrated Water Resources Management in Agricultural Areas. *Journal of Rural Studies*, 24, *:* 304-321

Ffolliott, P.F., Baker Jr., M.B., Edminster, C.B., Dillon, M.C., Mora, K.L., (2002). Land Stewardship Through Watershed Management: Perspectives for the 21st Century. Kluwer Academic/Plenum Publishers, New York

Flitcroft, R.L, Dedrick, D.C., Smith, C.L., Thieman, C.A. & Bolte, J.P. (2009) Social Infrastructure to Integrate Science and Practice: the Experience of the Long Tom Watershed Council, *Ecology & Society* 14(2):36

Fournier, S. (2012) “Getting It Right: Assessing and Building Resilience in Canada’s North” *The Conference Board of Canada*, Center for the North, May 2012 (56 pages)

Franks, T. (1999). Capacity building and institutional development: reflections on water. *Public Administration and Development* 19, 51–61.

Furuseth, O., Cocklin, C. (1995) "Regional perspectives on resource policy: Implementing sustainable management in New Zealand." Journal of Environmental Planning and Management 38: 181-200

Gallagher, C.(2003) Quit thinking like a scientist! Pages 183-190 *in* J. Oakes, R. Riewe, A. Edmunds,A. Dubois, and K. Wilde, editors. *Native voices in research.* Aboriginal Issues Press, Winnipeg, Canada.

Gargan, T. (1981) Consideration of Local Government Capacity, *Public Administration Review*; 41 (6): 649-658

Garande, T. & Dagg, S. (2005) Public Participation and Effective Water Governance at the Local Level: A Case Study from a Small Under-Developed Area in Chile *Environment, Development and Sustainability* 7(4): 417-431

Getches, D. H. (1998) Some irreverent questions about watershed-based efforts. In Brick, P., D. Snow, and S. Van De Wetering, (Eds.) 2001. Across the Great Divide: Explorations in Collaborative Conservation and the American West. Island Press: Washington, DC.

Goodman, R.M., Speers, M.A., McLeroy, K., Fawcett, S., Kegler, M., Parker, E., Rathgeb Smith, S., Sterling, T.D., Wallerstein, N., (1998). Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Education and Behavior* 25 (3), 258–278

Government of Canada, Constitution Act (1867). Ottawa. ON

Government of Canada (2004) Implementation of the International Covenant on Economic, Social, and Cultural Rights: 4th Periodic report to the UN under articles 16 and 17 of the Covenant, E/C.12/4/Add.15, p. 84.

Government of Saskatchewan (2005) "New road will link northern Saskatchewan to Athabasca Oil Sands" news release; retrieved from: http://www.gov.sk.ca/news?newsId=e17934d4-e783-4e37-9adf-dcedf9fa090f on 02.05.12

Government of Saskatchewan (2007) "Environment" "Provincial Parks" "Conserving" Retrieved from: http://www.environment.gov.sk.ca/Default.aspx?DN=50449289-36d5-4141-8d71-f81e7cc8d0e4 on 02.02.11

Government of Saskatchewan (2007ii) "Mineral and Exploration Guidelines for Saskatchewan" November 2007, (79 pages)

Government of Saskatchewan (2009) "Northern Affairs" "Maps" "Northern Administration District" retrieved from: http://www.fnmr.gov.sk.ca/NAD-map on 02.05.12

Government of Saskatchewan (2011) "Dispositions and Crown Sales" Energy and Resources, retrieved from: http://www.ir.gov.sk.ca/pngdispositions on 02.05.12

Government of Saskatchewan (2011i); About Saskatchewan, Quality of Life: Aboriginal Peoples; Retrieved on 11/01/11 at http://www.gov.sk.ca

Government of Saskatchewan (2011ii) "Crown Minerals Acquisition Process" Nineteenth Williston Basin Petroleum Conference May 2, 2011, Regina, Saskatchewan. Ministry of Energy and Resources

Government of Saskatchewan (2012) "Boreal Watershed Initiative Makes Progress", news releases; retrieved from: http://www.gov.sk.ca/news?newsId=ad8a59db-632b-47a6-86ed-931ef665b3de on 02.05.12

Government of the Northwest Territories, the (2009) *Northern Voices, Northern Waters: The NWT Water Stewardship Strategy* (the Strategy)

Graham, J., and Fortier, E. (2006).*Building Governance Capacity: the Case of Potable Water in First Nations Communities*. Report Prepared for the Institute on Governance. Ottawa, ON.

Griffin, C. B. (1999). Watershed Councils: An Emerging Form Of Public Participation in Natural Resource Management. *Journal of the American Water Resources Association*, *35*(3), 505-518. doi: 10.1111/j.1752-1688.1999.tb03607.x.

Grindle, S. and Hilderbrand, M. E. (1995) Building sustainable capacity in the public sector: What can be done? Public Administration and Development, 15 (5): 441–463, DOI: 10.1002/pad.4230150502

Habron, G. (2003). Role of adaptive management for watershed councils. *Environmental management*, *31*(1), 29-41. Springer New York. doi: 10.1007/s00267-002-2763-y.

Halliday, R. & Associates (2009) Industrial Water Use in Saskatchewan; Saskatoon SK. Nb 2009.05.25 (38 pages)

Hannikainen, L (1996) 'The Status of Minorities, Indigenous Peoples and Immigrant and Refugee Groups in Four Nordic States' 65 *Nordic Journal of International Law* 1, 35.

Harden A. & Levalliant H. (2008). Boiling point: Six community profiles of the water crisis facing First Nations within Canada. Ottawa: Polaris Institute. Retrieved on 20/11/2010, from www.polarisinstitute.org/ files/Boiling%20Point_0.pdf

Hardy, S.D. & Koontz, T.M. (2010) Collaborative watershed partnerships in urban and rural areas: Different pathways to success? *Landscape and Urban Planning* 95(3):79-90

Hartvelt, F., Okun, D.A.,(1991). Capacity building for water resources management.; *Water International* 16, 176–183.

Harvard University Kennedy School of Government (2005) "Yukon River Inter-Tribal Watershed Council", "2005 High Honors". Retrieved from: http://www.innovations.harvard.edu/awards.html?id=16859 on 05.05.12

Health Canada (1999) Towards a Healthy Future: Second Report on the Health of Canadians. Ottawa, ON: Health Canada

Health Canada (2012) "First Nations, Inuit and Aboriginal Health" "Drinking Water and Wastewater" retrieved from: http://www.hc-sc.gc.ca/fniah-spnia/promotion/public-publique/water-eau-eng.php#how_many on 02.05.12

Heber, R.W. (2005) Indigenous Knowledge, Resources Use, and the Dene of Northern Saskatchewan, *Canadian Journal of Development Studies* 26(2):247-256

Heikkila, T. & Gerlak, A.K. (2005) The Formation of Large-scale Collaborative Resource Management Institutions: Clarifying the Roles of Stakeholders, Science, and Institutions *The Policy Studies Journal*, 33(4): 583-612

Heller, K., Price, R.H., Reinharz, S., Riger, S. & Wandersman, A. (1984) *Psychology of Community* Change(2nd Edition). Homewood, IL: Dorsey

Henriques, I. and Sadorsky, P. (2008), Voluntary Environmental Programs: A Canadian Perspective. *Policy Studies Journal* 36: 143–166. doi: 10.1111/j.1541-0072.2007.00257.x

Hunter (2010) "Canada's cowardly vote on the right to water," *Victoria Times-Colonist*, August 1, 2010

Huntington, C.W., & Sommarstrom, S. (2000). *An evaluation of selected watershed councils in the Pacific Northwest and northern California*. Eugene, OR: Trout Unlimited and Pacific Rivers Council.

Hurlbert, M., Diaz,H., Corkal, D.R., J. Warren. (2009) "Climate change and water governance in Saskatchewan, Canada", International Journal of Climate Change Strategies and Management, 1 (2) pp.118 – 132

Innes, J.E. & Booher, D.E. "Collaborative policymaking: governance through dialogue" *Deliberative Policy Analysis: Understanding Governance in the Network Society* Ed. Hajer, M.A. & Wagenaar, H. Cambridge University Press, 2003 pp.33-59

Institute On Governance (1998) *Report on Completing the Circle: Aboriginal Governance in Urban Settings* (23 pages)

Ivey, J.L., de Loë, R.C., Kreutzwiser, R.D. (2006). Planning for Source Water Protection in Ontario. *Applied Geography* 26*:*192-209

Jackson, S. & Altman, J. (2009) Indigenous Rights and Water Policy: Perspectives from Tropical Northern Australia, *Australian Indigenous Law Review* 13(1):27-48

Jeffries, D.S. R.G. Semkin, J.J. Gibson, and I. Wong. (2010). "Recently surveyed lakes in northern Manitoba and Saskatchewan, Canada: characteristics and critical loads of acidity." J. Limnol. 69(Suppl. 1): 45-55

Keepers of the Water (2007) "The Keeper's Voice" Newsletter issue nb.11, Volume 1, November 2007 (6 pages)

Keepers of the Water; Keepers of the Water IV Watershed Gathering Conference Proceedings, Resolutions; August 19-23 (2010) Retrieved on 03/12/2010 from: http://www.keepersofthewater.ca/gatherings/2010

Kelly, E.N, Short, J.W, Schindler, D.W., Hodson, P.V., Ma, M., Kwan, A.K. & Fortin, B.L. (2009) Oil sands development contributes polycyclic aromatic compounds to the Athabasca River and its tributaries, *PNAS* 106(52):22346-22351

Kenney, D. S. (2000). *Arguing about consensus: Examining the case against western watershed initiatives and other collaborative groups active in natural resources management*. Boulder: University of Colorado School of Law

Keogh, K., Chant, D. & Frazer, B. (2006) *Review of Arrangements for Regional Delivery of Natural Resource Management Programmes: Final Report.* Ministerial Reference Group for Future NRM Programme Delivery, Departments of Agriculture, Fisheries and Forestry and Environment and Heritage, Canberra

Kettl, D.F. (2002) Environmental Governance: A Report on the Next Generation of Environmental Policy, Brooking Institution Press ISBN 0815702558 (203 pages)

King, L. (2004) Competing Knowledge Systems in the Management of Fish and Forests in the Pacific Northwest, *International Environmental Agreements: Politics, Law and Economics* 4: 161–177

King, S. J (2011) *Conservation Controversy: Sparrow, Marshall and the Mi'kmaq of Esgenoopetitj* The International Indigenous Policy Journal, 2(4) . Retrieved from: http://ir.lib.uwo.ca/iipj/vol2/iss4/5 on 02.05.12

Koontz, T. M. and Thomas, C. W. (2006), What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management?. Public Administration Review, 66: 111–121. doi: 10.1111/j.1540-6210.2006.00671.x

Krajnc, A. (2000) "Wither Ontario's environment? Neo-conservatism and the decline of the Environment Ministry." Canadian Public Policy 26: 111-127

Laidlaw, D. &Passelac-Ross (2010) "Water Rights and Water Stewardship: What About Aboriginal Peoples?" The University of Calgary Faculty of Law Blog on Developments in Alberta Law, University of Calgary, July 2010 (9 pages)

Lane, M., Robinson, C., Taylor, B. (2010) Contested country: local and regional natural resources management in Australia; Csiro Publishing, 2010 ISBN: 0643095861 (250 pages

Lane, M.B., (1997) Aboriginal Participation in Environmental Planning. , 35(November), p.308-323.

Lavigne, P. (2003) Watershed Councils East and West: Advocacy, Consensus and Environmental Progress, *UCLA Journal of Environmental Law & Policy* 22 :301-320

Lawrance, S.& & Mackelm, P. (2000) From Consultation to Reconciliation: Aboriginal Rights and the Crown's Duty to Consult. *Culture*, (1684), p.253 - 279.

Leach, W. & Pelkey, N., (2001) Making watershed partnerships work: a review of the empirical literature. *Journal of Water Resources Planning and Management* 127 (6), 378–385.

Lee, R.G. & Stankey, G.S. (1992) Major Issues associated with managing watershed resources. In Balancing Environmental, Social Political and Economic Factors in Managing Watershed Resources. Edited by Adams, P.W. & Atkinson, W.A. Corvalliz, OR: Oregon State University

Litke, S., & Day, J.C., (1998). Building local capacity for stewardship and sustainability: the role of community-based watershed management in Chilliwack, British Columbia. Environments 25 (2–3), 91–109.

Lockwood, M.; Davidson, J., Curtis, A., Stratford, E. and Griffith, R.(2010) Governance Principles for Natural Resource Management, *Society & Natural Resource*s DOI: 10.1080/08941920802178214

Loppi, S., Riccobono, F. Zhang, Z.H, Savic, S. Ivanov, D. & Pirintsos, S.A. (2003) Lichens as biomonitors of uranium in the Balkan area, *Environmental Pollution*125(2): 277-280, ISSN 0269-7491, 10.1016/S0269-7491(03)00057-5.

Lurie, S. & Hibbard M. (2008) Community-Based Natural Resource Management: Ideals and Realities for Oregon Watershed Councils, *Society & Natural Resources* 21(5)

Malone, L.A. (1990) Necessary Interrelationship between Land Use and Preservation of Groundwater Resources, *UCLA Journal of Environmental Law and Policy*: 9(1):1-73

Matsui, K. (2009) *Native People and Water Rights: Irrigation, Dams, and the Law in Western Canada* McGill-Queen's University Press ISBN: 0773535349 (243 pages)

Margerum, R.D. (2007) Overcoming Locally Based Collaboration Constraints, Society & *Natural Resources: An International Journal,* 20(2) 135-152

Meyer, P.D., (1990) Ground water monitoring at wellhead protection areas. *Groundwater Monitoring Review* Fall, 102–109

Mohan, G. (2006) Beyond participation: strategies for deeper empowerment. In: Cooke, B. and Kothari, U. Participation: The New Tyranny? London: Zed Books, pp. 153–167

Moore, T.C. (2009) "The Exhaustion of Progressive Aboriginal Governance" University of Tasmania, June 2009

Natcher, D. (2001) Land use research and the duty to consult: a misrepresentation of the aboriginal landscape. *Land Use Policy*, 18(2), p.113-122. Available at: http://dx.doi.org/10.1016/S0264-8377(01)00011-4 [Accessed November 15, 2010].

Natcher, D.C. & Hickey, C.G. (2002) Putting the Community Back Into Community-Based Resource Management: A Criteria and Indicators Approach to Sustainability, *Human Organization* 61(4):350-363

Newman, J., Barnes, M-A, Sullivan, H. and Knops, A. (2004). Public Participation and Collaborative Governance. *Journal of Social Policy*, 33: 203-223 doi:10.1017/S0047279403007499

Norman, E., Bakker, K., Cook, C. , Dunn, G. & Allen D. (2010) "Water Security: A Primer" *Developing a Canadian Water Security Framework as a Tool for Improved Water Governance for Watersheds (2008–2012)* Fostering Water Security in Canada Project (48 pages)

Northern Development Ministers Forum (2012) "Saskatchewan" retrieved from: http://www.focusnorth.ca/english/province/saskatchewan.php on 02.05.12

Notzke, C. (1994) Aboriginal Peoples and Natural Resources in Canada Captus Press, ISBN 1895712033 (337 pages)

Notzke, C. (1995) A new perspective in aboriginal natural resource management: Co-management, *Geoforum* 26(2): 187-209

Nowlan, L. & Bakker, K. (2007) Delegating Water Governance: Issues and Challenges in the BC Context, *BC water Governance Project; UBC Program on Water Governance*

Paehlke, R. (2000), Environmentalism in One Country: Canadian Environmental Policy in an Era of Globalization. Policy Studies Journal, 28: 160–175. doi: 10.1111/j.1541-0072.2000.tb02021.x

Parker, K.B., Margerum, R.D., Dedrick, D.C. & Dedrick, J.P. (2010) Sustaining Watershed Collaboratives: The Issue of Coordinator-Board Relationships *Society & Natural Resources: An International Journal* 23(5): 469-484

Parsons, G.F & Barsi, R. "Uranium Mining in Northern Saskatchewan: A Public-Private Transition" *Large Mines and the Community: Socioeconomic and Environmental Effects in Latin America, Canada, and Spain* Ed. McMahon, G. & Remy, F. IDRC/World Bank 2001 Out of Print. e-ISBN 1-55250-295-3
342 pp.

Patrick, R.J., Kreutzwiser, R., de Loë, R.C. (2008). Factors Facilitating and Constraining Source Water Protection in the Okanagan Valley, British Columbia. *Canadian Water Resources Journal*, 33(1): 39-54

Percy, D. (2012) Resolving Water-Use Conflicts: Insights from the Prairie Experience for the Mackenzie River Basin (February 22, 2012) C.D. Howe Institute , Commentary no.341 (28 pages)

Perreault, T. (2005) State restructuring and the scale politics of rural water governance in Bolivia *Environment and Planning A* 37: 263-284

Peterson, H. (2002) *Rural Drinking Water and Waterborne Illness*, Safe Drinking Water Foundation, Saskatoon, SK.

Phare, M-A.S. (2010) Denying the Source: The Crisis of First Nations Water Right; Rocky Mountain Books Ltd, ISBN: 1897522614 (99 pages)

Pirie, R.L., de Loë, R.C., and Kreutzwiser, R. (2004). Drought Planning and Water Allocation: an Assessment of Local Capacity in Minnesota. *Journal of Environmental Planning*, 73 : 25-38

Plumptre, T. & Graham, J. (1999) "Governance and Good Governance: International and Aboriginal Perspectives" Institute On Governance (27 pages)

Prebble, P. Coxworth, A., Simieritsch, T., Dyet, S., Huot, M. & Walsh, H. (2009) "Preventing Oil Sands Fever in Saskatchewan" Special Report for the Pembina Foundation, Saskatchewan Environmental Society and Canadian Parks and Wilderness Society (41 pages)

Pyle, G.G., Swanson, S.M. & Lehmkuhl, D.M. (2002) The Influence of Water Hardness, pH, and Suspended Solids on Nickel Toxicity to Larval Fathead Minnows, *Water, Air, and Soil Pollution,* 133: 215-226

Report of the Royal Commission On Aboriginal People (1996), Volume 2, Part One, P.115 - 139

Ribot, J. C. (2002) Democratic Decentralization of Natural Resources: Institutionalizing Popular Participation. Washington DC: World Resources Institute.

Richards, C. Sherlock, K. & Carter, C. (2004) Practical Approaches to Participation *SERP Policy Brief* (vol 1) Macaulay Institute, Aberdeen

Riebsame, W.E. (1997) Western Land Use Trends and Policy: Implication for Water Resources. Report to the Western Water Policy Review Advisory Commission, Western Water Policy Review Advisory Commission, Denver, Colorado

Rieke, B. and Kenney, D. (1997) Resource Management at the Watershed Level: An Assessment of the Changing Federal Role in the Emerging Era of Community-Based Watershed Management. Report to the Western Water Policy Review Advisory Commission, Western Water Policy Review Advisory Commission, Denver, Colorado.

Robins, L. (2007) Nation-Wide Decentralized Governance Arrangements and Capacities for Integrated Watershed Management: Issues and Insights from Canada. *Environments* 35: 1-47.

Robinson C, Williams LJ and Lane MB (2009) A broker diagnostic for assessing local, regional and LEB-wide institutional arrangements for Aboriginal governance of desert environments. In Measham TG, Brake L (Eds.). People, communities and economies of the Lake Eyre Basin, DKCRC Research Report 45, Desert Knowledge Cooperative Research Centre, Alice Springs. pp. 217–250.

Roger, P. & Hall, A. (2002) Effective Water Governance, *TEC Background Paper*, (7) GWP, Stockholm, Sweden

Royal Commission on Aboriginal Peoples (1994) *Public Policy and Aboriginal Peoples 1965-1992: Summaries of Reports, by Federal Bodies and Aboriginal Organizations, vol. 2*. Hull: Canada Communication Group, pp. 226-27.

Saric, M.R., Stojanovic, M. & Babic, M. (1995) Uranium in plant species grown on natural barren soil, 18(7)

Saskatchewan Eco Network "How's the Water? Perspectives on Water and Rural Communities in Saskatchewan " available at: http://econet.ca/issues/water/water_background.html retrieved on 02.05.12

Saskatchewan Ministry of the Environment (2011) "Saskatchewan's 2011 State of the Environment Report" (72 pages)

Saskatchewan Watershed Authority (2008) Source Water Protection Plans for Saskatchewan Watersheds, 2008; "Watershed and Aquifer Planning"; "Watershed and Aquifer Planning Map" retrieved from: http://www.swa.ca/Stewardship/WatershedPlanning/Default.asp?type=Overview on 02.02.11

Saskatchewan Watershed Authority (SWA)(2010) "About Us" Retrieved on 20/11/10 from http://www.swa.ca/

Schindler, D. (2010) Tar Sands Need Solid Science, *Nature* 468: 499-501

Schneider, T., 2011. Accounting for Environmental Liabilities under International Financial Reporting Standards. Oil Sands Research and Information Network, University of Alberta, School of Energy and the Environment, Edmonton, Alberta. OSRIN Report No. TR-9. 16 pp.

Schramm, L.L., Kramers, J.W. & Isaacs, E.E., (2009) Saskatchewan ' s Place in the Canadian Oil Sands. , 3.

Schusler, T.M., Decker, D.J. & Pfeffer, M.J. (2003) Social Learning for Collaborative Natural Resource Management, *Society & Natural Resources* 16(4)

Schuster, P.F. & Maracle, K.B. (2010), Studies of climate change in the Yukon River Basin—Connecting community and science through a unique partnership: U.S. Geological Survey Fact Sheet 2010-3020, 4: 44-50

Scott, K. A., B. Wissel, J.J. Gibson, and S.J. Birks (2010). "Chemical characteristics and acid sensitivity of boreal headwater lakes in northwest Saskatchewan." J. Limnol. 69(Suppl. 1): 33-44.

Simeone, T. (2010). Safe Drinking Water in First Nations Communities. *Parliament Library*, (08).

Simpson, L. (2001) Aboriginal peoples and knowledge: decolonizing our processes. *Canadian Journal of Native Studies* 21(1):137-148.

Sipe, N.G. (1998) An Empirical Analysis of Environmental Mediation, *Journal of the American Planning Association* 64(3)

Slattery, B. (1982) The Constitutional Guarantee of Aboriginal and Treaty Rights, *8 Queen's L.J.* 232-295

Smith, C.L. & Gilden, J.,(2003) Assets to move watershed councils from assessment to action 1., 38(3), p.653-662.

Smith, D.E. (2005) "Researching Australian Indigenous Governance: A Methodological and Conceptual Framework" Center for Aboriginal Policy Research, Working Paper no.29/2005 ISBN 07315 4928 7 (36 pages)

Statistics Canada (2006) Saskatchewan Aboriginal Peoples, *Census of Canada 2006* Retrieved on 28/11/10 from www.stats.gov.sk.ca

Statutes of Saskatchewan (2002) "The Environmental Management and Protection Act, 2002" Chapter E-10.21

Statutes of Saskatchewan (2002) "The Water Regulations, 2002" Chapter E-10.21 Reg 1

Tawatinaw Watershed Stewards (n.d.) "Our River is Changing. Be informed and be heard." Retrieved from: https://sites.google.com/site/tawatinawstewards/ on: 02.05.12

Thai, K.V., Rahm, D. & Coggburn, J.D. (2007) Handbook of Globalization and the Environment, CRC Press 2007, ISBN 1574445537 (588 pages)

Thomas, C.W. (1999) Linking public agencies with community-based watershed organizations: lessons from California. Policy Studies Journal 27, 544-564.

Thompson J (2005) An introduction to wetland mitigation in Canada. In: Wetland policy and mitigation: new opportunities for wetland conservation, Saskatoon.

Timmer, D.K., de Loë, R.C., Kreutzwiser, R.D. (2007). Source Water Protection in the Annapolis Valley, Nova Scotia: Lessons for Building Local Capacity. *Land Use Policy* 24, *:* 187-198

Trachtenberg, Z. & Focht, W. "Legitimacy and Watershed Collaborations: The Role of Public Participation" I Swimming Upstream: Collaborative Approaches To Watershed Management Ed. Sabatier, P.A. MIT Press 2005. ISBN: 0262693194 (327 pages)

Trocki, L.K., Curtis, D.B., Gancarz, A.J. & Banar, J.C. (1984) Ages of major uranium mineralization and lead loss in the Key Lake uranium deposit, northern Saskatchewan, Canada, *Economic Geology and the Bulletin of the Society of Economic Geologists* 79(6):1378-1386

Tropp, H. (2007) Water Governance: trends and needs for new capacity development *Water* Policy 9(2):19-30

United Nations Committee on Economic, Social and Cultural Rights (2006) *Consideration of reports submitted by States parties under articles 16 and 17 of the Covenant: Concluding observations of the Committee on Economic, Social and Cultural Rights: Canada*. UN Docs E/C.12/CAN/CO/4 and E/C.12/CAN/CO/5. at paras. 1, 15

Usher, P. J. 2000. Traditional ecological knowledge in environmental assessment and management. *Arctic* 53(2):183-193.

Waite, D. T.; Joshi, S. R.; Sommerstad, H.; Wobeser, G.; Gajadhar, A. A. (1990) A toxicological examination of whitefish and northern pike exposed to uranium mine tailings, *Archives of Environmental Contamination and Toxicology* 19(4):578-582

Wallerstein, N. (1999) Power between the evaluator and the community: Research Relationships with New Mexico's healthier *communities Social Science and Medicine* (49):39-58

Weber, E.P., Lovrich, N.P. & Gaffney, M.J. (2005) Collaboration, Enforcement, and Endangered Species: A Framework for Assessing Collaborative Problem-Solving *Capacity, Society & Natural Resources: An International Journal*, 18:8, 677-698

Weibust, I. 2009. Green Leviathan: The Case for a Federal Role in Environmental Policy. Burlington, VT: Ashgate.

Wilson, P. (2004) First Nations Integrated Watershed Management *Canadian Perspectives on Integrated Water Resource Management* Chapter 4; 69-83, ISBN 1-896513-26-3

Wondollecj, J. M., Manring, N. J. and Crowfoot, J.E. (1996) Teetering at the Top of the Ladder: The Experience of Citizen Group Participants in Alternative Dispute Resolution Process *Sociological Perspectives* 39(2): 249-62

World Nuclear Association (2012) "Uranium in Canada" retrieved from: http://www.world-nuclear.org/info/inf49.html on 02.05.12

Woynillowicz, D., Severson-Baker, C. & Raynolds, M. (2005) "The Environmental Implications of Canada's Oil Sands Rush, special report for the Pembina Institute ISBN 0-921719-83-3 (78 pages)

Yukon River Inter-Tribal Watershed Council, the (YRITWC) "About Us" Retrieved on 25/11/10 from: http://www.yritwc.org/AboutUs/AboutUs/tabid/56/Default.aspx

Zadozewski, R.; Judd-Henrey, I.; Nilson, S. & Bharadwaj, L. (2011) Perspectives on Past and Present Waste Disposal Practices: A Community-Based Participatory Research Project in Three Saskatchewan First Nations Communities, *Environmental Health Insights*, 5:9-20

APPENDICES

APPENDIX 1: The University of Saskatchewan Research Ethics Board (REB) Consent form

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

Certificate of Approval
Study Amendment

PRINCIPAL INVESTIGATOR	DEPARTMENT	Beh-?
Robert Patrick	Geography	11-73

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT
University of Saskatchewan

STUDENT RESEARCHER(S)
Nadine Lemoine

FUNDER(S)
INTERNALLY FUNDED

TITLE
Institutional Arrangements & Capacity-Building needs for Effective Watershed Governance in Northern Saskatchewan

APPROVAL OF	APPROVED ON	CURRENT EXPIRY DATE
Revised Letter of Consent	26-Aug-2011	06-Apr-2012

Full Board Meeting ☐ Date of Full Board Meeting:

Delegated Review ☒ Expedited Review ☐

CERTIFICATION
The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: *http://www.usask.ca/research/ethics_review/*

John Rigby, Chair
University of Saskatchewan
Behavioural Research Ethics Board

Please send correspondence to:
Research Ethics Office
University of Saskatchewan
Box 5000 RPO University, 1607-110 Gymnasium Place
Saskatoon SK S7N 4J8
Telephone: (306) 966-2975 Fax: (306) 966-2069

APPENDIX 2: List of Interview Questions

1. What role does your organization play in water governance in Saskatchewan generally? In northern Saskatchewan specifically (generally north of Prince Albert)?

2. Describe the current water governance model, or framework, in *northern* Saskatchewan.

3. Is the current water governance structure effective in *northern* SK? Why? Why not?

4. In order of importance, list your top 3 water quality and/or quantity related issues/concerns for northern Saskatchewan.

5. In order of importance, list your top 3 water governance issues/concerns for northern Saskatchewan.

6. In your opinion, what is needed to make water governance in northern SK more effective?

7. In your opinion, who should be involved in water governance in northern SK?

8. What changes, if any, are necessary to make water governance more effective in northern SK?

9. In your opinion, would an organization such as a watershed council for northern Saskatchewan be desirable? Why? Why not? Name the groups, organizations that should be included in such a Council.

10. Would you or your organization be willing to participate in a watershed council for northern Saskatchewan?

11. Please identify any individuals or organizations that we should contact that may be helpful to this research project.

APPENDIX 3: Participant Role in Watershed Governance

Organization	Role in Watershed Governance	n
FIRST NATIONS (n=10)		
Hatchet Lake First Nation – Band Representative	Chief of Hatchet Lake First Nation for the past year. Uses water for livelihood.	1
Hatchet Lake First Nation – Community Development Representative	Responsible for dealing with relationships with local industry and residents. Works on communication between different actors.	1
Hatchet Lake First Nation – Community Members	Key resident stakeholders / concerned and influential residents; use the water for livelihood	2
Hatchet Lake First Nation – Elders	Community Elders – providing knowledge to future generations; Uses water for livelihood.	4
Hatchet Lake First Nation – Health Office Representative	Responsible for dealing with the management of health issues and outreach in the community – including Boil Water Advisories; Uses water for livelihood.	2
GOVERNMENTAL (n=9)		
Prince Albert Grand Council (PAGC)	The PAGC does not have any representation in any of the watershed boards that have been created in Saskatchewan. The PAGC represents 12 First Nation communities in the NAD. This group is concerned with the longevity of the water quality and quantity found in the north and is set out to create a lead in First Nation Treaty governance, taking balanced approaches to the protection of its Treaty and Inherent Rights. They have also supported the resolution from "Keepers of the Water IV" for the creation of a Northern Saskatchewan Watershed Council.	1
Saskatchewan Environment - Northern Saskatchewan Environmental Quality Committee and Northern Mines Monitoring Secretariat (*EQC*)	The Northern Saskatchewan Environmental Quality Committee (EQC) focuses entirely on environmental quality issues and concerns in the Northern Saskatchewan Administration District (NAD). EQC's involvement in the north specifically focuses on uranium operations and monitoring of industrial use. They have started/hope to continue their cumulative effects monitoring programme, which has currently been dropped by the province.	1

Saskatchewan Environment - Uranium and Northern Operations	The Northern Uranium Branch manages the northern uranium section for the ministry of the environment. They are directly involved in the monitoring of industrial development in the north and water and water issues in their operations.	1
Saskatchewan Environment – Industrial Branch	The Industrial Branch of the Ministry of Environment carries out regulatory and compliance functions related to mining and industrial activities to ensure the environment and human health and safety are protected from potential adverse effects. Industrial Branch staff manages environmental protection activities from design through operations to the decommissioning and reclamation of facilities. This includes reviewing project proposals, environmental impact statements, compliance inspections of regulated activities, review of compliance reports, investigation of infractions, and enforcement when warranted	1
Saskatchewan Environment	The Ministry of the Environment has the general overall provincial responsibility in the bulk of the water related regulations (which many of them would be reworked under the new “results based framework”).	2
Government of Saskatchewan – Northern Municipal Services & Planning	Centralize comprehensive and professional planning and development services in the north and provide communities and groups of communities with added support to develop and implement planning respectful of northern values. Through the recent “Planning for Growth Northern Program" (PFGN) they will provide opportunities for northern communities to work with planners to: develop official community plans and zoning bylaws; build municipal capacity to implement official community plans; and build and enhance relationships to support long term regional planning activities	1
Saskatchewan Watershed Authority	From a legislative perspective the Saskatchewan Watershed Authority has the responsibility for drainage projects in the agriculture areas which consist of conservation and development authorities. In terms of “Watershed Planning” the SWA does not currently have any legislation that’s specific to watershed plans. This current model was developed through discussions with community members. Each watershed is governed differently, but within each model, we find an urban representative, a rural representative, municipalities, a conservation representative and often First Nations or Metis representative depending on who is present in the watershed. There are currently 4 committees in Northern Saskatchewan. The government usually has representatives from each basin – approximately 12 to 16 people depending on each sub-	2

	division.	
INDUSTRY **(n=5)**		
AREVA Resources Corporation	AREVA is an industrial water user which foci speak to the undertaking of nuclear development projects in northern Saskatchewan. Their activities fall within the current federal and provincial water governance framework and jurisdiction. AREVA strives to minimize water use and optimize treated water releases within their current sustainable development framework.	1
Cameco Corporation	Cameco is a major industrial player and believe that they currently do not play a role in water governance in Northern Saskatchewan.	1
Mystik Management	Mistik Management Ltd. (Mistik) is a woodlands management company based out of Meadow Lake. Mistik does not play a role in watershed governance responsibilities. The bulk of their water intake is from the Churchill system. Their interaction with watershed is mostly surface cover including some riparian areas	1
Oilsands Quest Inc.	Oilsands Quest is a private company that complies with the exciting rules and regulations that are in place by the province regarding water use and withdrawal. They are currently a major player in the north of the province and a major industrial water user especially with new and upcoming tar sands projects. They need clean fresh water to run their operations.	1
Sask Water	SaskWater is a water and wastewater supply utility. They own and operate water utilities. Up until October 2009 they did not have any contracts in Northern Saskatchewan. They currently have a project located in the Northwest and have a combination of different projects, "complicated arrangement" of small operations with another group called A-TAP. They mostly have smaller contracts in 31 of the 35 communities in the north of the province.	1
NON-GOVERNMENTAL **(n=6)**		
Athabasca Enterprise Region Corporation	AREC's roles include the monitoring and evaluation of northern industrial activity to ensure the long term integrity of freshwater sources.	1

(AERC)		
New North – Northern Administration District	This organization is limited to the NAD of Saskatchewan. New North is concerned with some of the members of their organization in the north that require water use to run treatment plants – largely due to the influence this has on drainage and waste water treatment in their community.	1
Northern Resident/Activist	Concerned northern resident, politically active; water user for livelihood	1
Prince Albert Model Forest	Prince Albert Model Forest is a highly active organization in northern Saskatchewan. The role of the organization is to promote community sustainability through economic and social welfare. When the forest industry developed across the country, the model forest program challenged the traditional forestry mandate to find ways to involve residents in being directly involved in long-term welfare of their northern economy. The PAMF is also currently active in a northern watershed group – the Candle Lakes Watershed Stewardship Committee.	1