NAVIGATING RECONCILIATION THROUGH CULTURAL FLOWS FOR

INDUSTRIALIZED FREE-FLOWING RIVERS

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ABSTRACT

Cultural flows are an emergent water policy tool gaining recognition for their potential to overcome the continued marginalization of Indigenous peoples' interests in Canadian freshwater governance, but quantified cultural flows are rarely adopted by state governments. Using community-based participatory research and leveraging an Ethical Space Framework, this research provides practical insight into the adoption of cultural flows in ways mutually acceptable to state governments and Indigenous peoples. The practical insight was gained by demonstrating the significance of a quantified cultural flows example termed Aboriginal Navigation Flows from Alberta and the institutional influences on its adoption by the provincial government. Data collected through documents and interviews revealed that ANF were significant because they translated an Indigenous conception of wellness connecting river navigability, boating, human relationships, human-waterscape relationships, Indigenous rights, and self-determined change adaptation. These insights into ANF significance showed how cultural flows could meaningfully shape freshwater governance in which environmental flow assessments for free-flowing rivers are undertaken. Data collected through documents and interviews and analyzed using the Implementing Innovation Framework revealed that structural institutions critically influenced ANF adoption. Joint communications by collaborating Indigenous peoples worked to overcome state government resistance grounded in vested economic interests. To reshape structural institutions, cultural drivers of ANF adoption could be better leveraged by overcoming individual barriers to ANF adoption. Collectively, these insights into ANF adoption show how freshwater governance arenas may become ethical spaces.

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The thesis was only finished because of the support and encouragement given to me by my academic committee and SENS family. Toddi, you gave me the space to learn as much as I could from this experience. Thank you for your patience and for your kind heart that always sought to listen and be fair. Lalita, your depth of commitment to ethical interactions between researchers and communities is admirable, and something I strive for. Your humility and warmth were and continue to be appreciated. Jen and Patricia, thank you for your time, thoroughness, and tough questions that made this work better. Dr. Phil Loring and Dr. Tim Jardine, I consider you honorary committee members for the learning opportunities you opened for me even though I was not your student. My time in SENS was very much enriched by your efforts. A big thank you to Tracey McHardy and Charlotte Hampton for your patient guidance and support in helping me meet my commitments to the community. You always had my back.

DEDICATION

For Mom, who taught me perseverance and independence. For Dad, who nurtured my curiosity and showed me how much can be learned from sitting quietly by a fire. You both are gone, but I see you in these pages.

For Uncle Robert and Aunty Georgia. Both of you were always there when I needed to be cared for the most.

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LIST OF ABBREVIATIONS

ABF   Aboriginal Base Flow

ACFN   Athabasca Chipewyan First Nation

ANF   Aboriginal Navigation Flows

AXF   Aboriginal Extreme Flow

CBPR   Community-Based Participatory Research

CEMA   Cumulative Environmental Management Association

CGT   Constructivist Grounded Theory

DFO   Department of Fisheries and Oceans (now Fisheries and Oceans Canada)

ESF   Ethical Space Framework

FCM   Fort Chipewyan Métis

FNIGC   First Nations Information Governance Centre

GoA   Government of Alberta

IFNTTG   Instream Flow Needs Technical Task Group

IIF   Implementing Innovation Framework

MCFN   Mikisew Cree First Nation

MLDRIN   Murray Lower Darling Rivers Indigenous Nations

NRTEE   National Round Table on the Environment and the Economy

P2FC   Phase 2 Framework Committee

RSDS   Regional Sustainable Development Strategy for the Athabasca Oil Sands Area

SWQMFLAR Surface Water Quantity Management Framework for the Lower Athabasca River

PREFACE

This thesis recounts two distinct but related stories about the river navigability needs of the Mikisew Cree First Nation (MCFN) and Athabasca Chipewyan First Nation (ACFN) and the capture of those river navigability needs in surface water quantity policy for the Lower Athabasca River in northern Alberta, Canada. The idea to tell the two stories was community-driven, emerging from MCFN's and ACFN's desire to preserve their ability to access their territories by boats now and for future generations. In the first story, the significance of a freshwater policy tool termed Aboriginal Navigation Flows (ANF) to MCFN and ACFN is shared. To tell the first story, the Indigenous research partners and I respectfully engaged with each other so that I could explore the meanings of ANF. The second story explains how ANF may be advanced ethically in mutually acceptable ways within cross-cultural freshwater governance arenas led by the provincial government in collaboration with the federal government. To tell this story, I had to understand the barriers and drivers that influenced the provincial government's adoption of ANF and the patterns of those influences. Knitting these two distinct stories together required an overarching theoretical lens that could cohesively connect them, but that could also accommodate differences in the stories' conceptual framings (Figure P.1).

Ermine's Ethical Space Framework (ESF) was the overarching theoretical lens used to create cohesion among these two stories. The ESF is an orienting framework that seeks to dismantle power relationships within a colonial context to foster conditions that support cross-cultural collaborative innovation. Fostering conditions that support innovation under the ESF, in part, entails deep explorations of different sets of perspectives. Under the ESF an opening was created for me to explore and sequentially present (i) Indigenous peoples' perspectives on the significance of ANF; (ii) provincial and federal government and Indigenous community perspectives on state government adoption of ANF; (iii) the commonalities between government and Indigenous community perspectives; and (iv) the patterns in which those commonalities occur. This sequential exploration and presentation of findings also served to address the Indigenous research partners' concerns that they would not see their words in this research. Hence, the ESF served to connect the stories and the people involved in this research.

Applying the ESF to unite the two stories necessitated the respectful consideration of the nature of each story. The importance of river navigability and rationale for ANF development as perceived by its Indigenous creators, which form the contents of the first story, were explored through application of community-based participatory research and constructivist grounded theory. Steelman's Implementing Innovation Framework (IIF) was applied within the community-based participatory research approach to understand perspectives on influences of provincial government adoption of ANF which shaped the subject of the second story. Together, the ESF and story-specific research designs enabled cohesion between the two distinct but related stories in ways that added scholarly rigour to this thesis and contributed to ethical relationships with our Indigenous research partners.
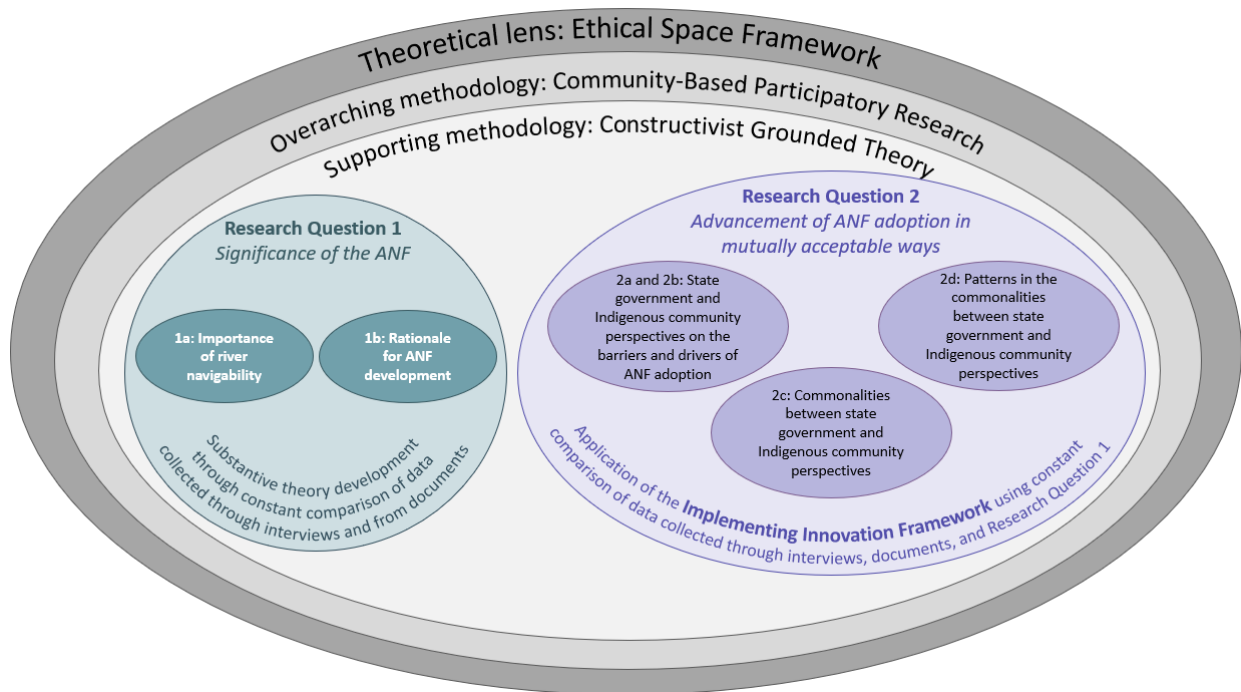
Figure P.1: Research design to create cohesion amongst two distinct stories

CHAPTER 1 – OVERCOMING THE MARGINALIZATION OF INDIGENOUS PEOPLES IN FRESHWATER GOVERNANCE THROUGH CULTURAL FLOWS

1.0 Background

Let us find a way to belong to this time and place together. Our future, and the well-being of all our children, rests with the kinds of relationships we build today.
　　- Gwawaenuk Elder Chief Dr. Robert Joseph, Reconciliation Canada Ambassador
　　　(Truth and Reconciliation Commission, 2015, p. 363)

Gwawaenuk Elder Chief Dr. Robert Joseph expressed the pressing need for Indigenous[1] and settler peoples[2] of Canada to work together so that innovative means may be found to secure the well-being of current and future generations. Peoples' physiological, spiritual, cultural, social, and economic well-being is inextricably linked to freshwater (Krause & Strang, 2016). In Canada, where 20% of the world's freshwater supply and 7% of the world's renewable freshwater supply is located, the contributions of waterways to peoples' well-being are generally taken for granted (National Round Table on the Environment and the Economy [NRTEE], 2010). However, Canadians' long held perception that the country's freshwater is pristine, plentiful, and secure is shifting in response to intensifying watershed disturbance, altered river flows, and climate change effects (Bakker & Cook, 2011; NRTEE, 2010; World Wildlife Fund, 2017).[3]

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[1] Throughout this thesis, I shift between "Aboriginal," "Indigenous", "First Nation", and "Métis" depending on context in accordance with the definitions used by legal writers Phare (2009) and Gutman (2018). "Indigenous" is used here to collectively refer to First Nations and Métis peoples, in keeping with internationally used terminology in the *United Nations Declaration of the Rights of Indigenous People.* "Aboriginal" is a legal term from the *Constitution Act, 1982* encompassing First Nations, Métis, and Inuit peoples living in Canada, and so I use it when referring to constitutionally protected rights or the common law. Mikisew Cree First Nation (MCFN) and the Athabasca Chipewyan First Nation (ACFN) are collectively referred to as First Nations and citizens of Fort Chipewyan Métis (FCM) Local 125 are referred to as Métis to respect their naming practices.

[2] "Settler peoples" is used to refer to the Europeans who first made contact with Indigenous peoples through trade and settlement and their descendants who presently form the sociopolitical majority in Canada (Vowel, 2016).

[3] The World Wildlife Fund (2017) found that out of 167 sub-watersheds in Canada, 53 have experienced high to extremely high levels of human disturbance, the flows in 27 have been highly or very highly altered, 21 are already enduring high impacts from climate change, and 105 sub-watersheds have been moderately impacted by climate change. The effects of these stressors on Canada's watersheds have not been quantified but they do indicate that freshwater availability cannot be considered secure (Bakker & Cook, 2011; NRTEE, 2010; World Wildlife Fund, 2017).

Many Indigenous peoples experience altered waterways as a loss of a loved one with whom they are in a reciprocal, intimate relationship (Anderson, 2010; Cave & McKay, 2016; Weir, 2009), which may leave some Indigenous peoples' sense of well-being deeply impacted by declining freshwater flows (Native Counselling Services of Alberta, 2013; Weir, 2009).[4] One remedy used by some Indigenous peoples to sustain or improve their well-being is participation in freshwater governance arenas established by state governments[5] (Wilson & Inkster, 2018). Freshwater governance is defined in this thesis as the range of institutions[6] operating within ontological and political contexts through which information is gathered and evaluated and decisions about freshwater are made (adapted from Bakker, 2003 and NRTEE, 2010 using Wilson et al., 2019 and Yates et al., 2017). Participation in state government-led freshwater governance is not a panacea for Indigenous peoples in Canada (Curran, 2019; Hania & Graben, 2020; Wilson & Inkster, 2018) who continue to be disproportionately affected by water problems (Castleden et al., 2017). Innovative ideas are vital to overcome challenges experienced by Indigenous peoples within freshwater governance arenas so that Indigenous peoples can achieve well-being in ways meaningful to them.

Marginalization of Indigenous peoples' interests[7] in freshwater is a problem that persists in state government-led governance arenas in Canada that needs to be overcome (Curran, 2019; Hania & Graben, 2020; McGregor, 2014; Wilson & Inkster, 2018). Indigenous peoples are marginalized in freshwater governance when their emotional and spiritual relationships with

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[4] Acknowledging that homogenizing Indigenous worldviews is disrespectful (Peters & Mika, 2017), ontological similarities amongst Indigenous peoples have been found, including reciprocal human-water relationships in which each have responsibilities towards the other (Anderson, 2010; Cave & McKay, 2016; Weir, 2009). These ontological similarities underpin this thesis.

[5] State governments refer to governments of countries or political subdivisions within a country such as provinces, territories, or states (https://www.dictionary.com/browse/government). The Governments of Canada (federal government) and Alberta (provincial government) are examples of state governments. "State governments" in this thesis are used to differentiate governments of countries and their political subdivisions from Indigenous governments.

[6] Steelman's (2010) definition of "institutions" is used in this thesis as it is her Implementing Innovation Framework that is used to explore Research Question 2. Institutions, to Steelman (2010), are the "structures, rules, laws, norms, and sociocultural processes that shape human actions" (p. 3). Under this definition of institutions, processes and procedures would be considered institutions. See section 2.3.1.

[7] Interests in this thesis are the "patterns of value demands and supporting expectations about the conditions for satisfying those demands" (Bischoff-Mattson et al., 2018, p. 236)

water (Castleden et al., 2017); environmental, cultural, social, economic, and political needs (Castleden et al., 2017; Hemming et al., 2019); knowledge systems (Jackson, 2017; Phare, 2009); and Aboriginal and treaty rights[8] (Castleden et al., 2017; Curran, 2019; Laidlaw & Passelac-Ross, 2010) are neglected or superficially accounted for within the institutional contexts through which decisions about freshwater are made. Neglect or superficial treatment of Indigenous peoples' interests in freshwater can be largely attributed to settler-colonial processes that continue to assert ontological, epistemological, and political hegemony over Indigenous peoples and their territories (Tsatsaros et al., 2018; Wilson & Inkster, 2018). For legal (e.g., Crown's consultative obligations towards Indigenous peoples set out in common law), moral

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[8] A full discussion of the meaning of Aboriginal and treaty rights is outside the scope of this thesis, but brief definitions are provided here for readability purposes. Aboriginal and treaty rights are collective rights of distinct Indigenous societies that the Canadian common law requires be "recognized either by court declaration or through the process of treaty negotiation" (Gutman, 2018, p. 7). The sources of these rights differ:

- Aboriginal rights flow from Indigenous peoples' historical and continued occupation of territories within Canada since before colonization (Phare, 2009) and "must be interpreted flexibly so as to permit their evolution over time" (Gullason, 2018, p. 32). The degree of overlap between Aboriginal rights and inherent rights is debated: some argue that Aboriginal rights are inherent rights, while others argue that they are distinct because inherent rights are given to Indigenous peoples by their Creator and do not require validation by Canadian courts or law (Phare, 2009; Gullason, 2018). Aboriginal title, a type of Aboriginal right, is a communally held property right of exclusive occupation that flows from an Indigenous society's occupation and exclusive use of land prior to colonization (Gullason, 2018).

- Treaty rights are derived from treaties considered to be legally binding and solemn agreements between Indigenous peoples and state governments within Canada outlining each signatory's obligations and responsibilities towards the other (see Isaac & Annis, 2010). The area covered by a treaty may encompass the traditional territories of multiple distinct Indigenous societies, and as a result, the courts have found that the treaty rights of any one Indigenous society may be limited to a particular geographic area within the boundaries of a treaty (see Isaac & Annis, 2010). The geographic limitation of treaty rights continues to be debated (Isaac & Annis, 2010) along with whether Indigenous signatories to treaties also possess Aboriginal rights (Gutman, 2018).

Aboriginal and treaty rights are constitutionally protected, but they are not absolute. Aboriginal and treaty rights can be infringed by the federal and provincial governments where such infringements are justified according to legal tests set out in the common law (Gutman, 2018; Isaac & Annis, 2010). Legal debate about the circumstances under which infringement is justified and the process for determining the extent of infringement continues (Gutman, 2018).

(e.g., support for cultural diversity), and practical (e.g., benefiting from Traditional Knowledge[9] in the development of sustainable environmental policy) reasons, solutions that help overcome the marginalization of Indigenous peoples' interests in freshwater governance are vital (Bullock et al., 2020; Hanrahan, 2017; Nowlan & Bakker, 2010; Plummer, Armitage, & de Loë, 2013; Reo et al., 2017).

"Cultural flows" are one potential policy concept to help overcome the marginalization of Indigenous peoples' interests in freshwater governance (Jackson, 2017; Weir, 2009). Cultural flows in this thesis refer to river flows or water amounts that achieve Indigenous peoples' self-determined interests. Often, state government representatives tend to misunderstand Indigenous peoples' freshwater-related interests and do not know how to relate the interests to specific river flows. Through cultural flow assessments, Indigenous peoples translate[10] their freshwater interests into hydrologic variables using culturally-respectful approaches so that their freshwater needs are more comprehensible to people outside their communities (Jackson et al., 2015; Lokgariwar et al., 2014; National Cultural Flows Research Project, 2020; Tipa & Nelson, 2012).[11] Improving state government representatives' understanding of Indigenous peoples' freshwater interests is a critical prerequisite to overcoming marginalization of Indigenous interests in cross-cultural freshwater governance (Tan & Jackson, 2013; Tipa & Nelson 2012). Hence, understanding how to advance cultural flows within freshwater governance arenas can help secure Indigenous peoples' freshwater interests (Mackenzie et al., 2017a, 2017b).

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[9] Traditional Knowledge is defined in this thesis as the collective knowledge held by Indigenous people living today that is accumulated by listening to their ancestors and relationally experiencing the waterscape throughout their lifetimes. Thus, Traditional Knowledge can evolve as different experiences with the waterscape are accumulated and the social context within which those experiences occur change. Knowledge held by Indigenous peoples has many labels such as Indigenous Knowledge, Traditional Ecological Knowledge, and Indigenous Science. The label "Traditional Knowledge" is used in this thesis to align with the labelling choices of the Mikisew Cree First Nation (MCFN) and Athabasca Chipewyan First Nation (ACFN) for their community-based monitoring programs. MCFN and ACFN developed the freshwater policy tool that is the subject of examination for this research. See section 1.2 of this chapter and Chapter 4 for more details about the First Nations' freshwater policy tool.
[10] Knowledge translation can be disrespectful (Nadasdy, 2003), but in cultural flow assessments knowledge translation is considered appropriate when knowledge holders complete or direct the translation (see MLDRIN, 2007).

[11] Cultural flow assessment in this thesis refers to the process used by Indigenous peoples to determine the flow regime needed to meet their context-specific interests in freshwater.

Support for cultural flows is growing amongst Indigenous peoples and state governments (Jackson & Moggridge, 2019; Magdaleno, 2018). For example, the Indigenous peoples of the Murray-Darling River basin developed their own policies defining cultural flows and establishing cultural flow assessment methods (e.g., National Cultural Flows Research Project, 2020). The Australian Government's Murray Darling Basin Plan signed into law in 2012 under that country's *Commonwealth Water Act, 2007*, requires that water resource plans have "regard to the views of Indigenous people with respect to cultural flows" (Weir, 2016, p. 145). The rising interest in cultural flows opens opportunities for its diffusion into jurisdictions such as Canada that do not use cultural flows terminology in legislation and policy but are seeking ways to meaningfully involve Indigenous peoples in freshwater governance (Simms et al., 2016).

While the cultural flow concept is gaining traction as a freshwater policy tool, it has rarely been adopted in practice (Bischoff-Mattson et al., 2018; Jackson, 2017). Adoption is defined here following Howlett et al. (2009) and Marier (2017): adoption is the part of a policy process in which policy problems are recognized, potential solutions are identified and assessed, and a course of action is selected. Solutions can be rejected, partially accepted, or fully accepted through the adoption process. Little empirical research has been done to understand why quantified cultural flows are being rarely adopted by state governments, a gap this thesis aims to help fill using a cultural flow example termed Aboriginal Navigation Flows (ANF) from northern Alberta, Canada. Specifically, this thesis elucidates the influences[12] on the adoption of ANF by the provincial government to gain insights into how ANF may be advanced as a policy tool to help overcome the marginalization Indigenous peoples interests in freshwater governance arenas. The insights of ANF case may inform the work of Indigenous peoples and state governments in other jurisdictions who are seeking meaningful ways to involve Indigenous peoples in freshwater governance through cultural flows.

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[12] Influences in this thesis are determining factors that affect a course of action (https://www.thefreedictionary.com/influence).

1.1   Aboriginal Navigation Flows as the Cultural Flows Example

This study captures the importance of the Lower Athabasca River system to the practice of our Treaty Rights. Because of this importance, the Governments of Alberta and Canada must clearly consider and protect our Treaty Rights in the rules governing water allocations from the Lower Athabasca River. The issue is not what is causing water levels to decline, but how we can plan for, manage, and sustain this important resource for our future generations. The thresholds and recommendations developed in this study offer a way to "translate" our treaty rights and cultural needs into a format that can be used to inform policy and decision-making on the Lower Athabasca River.

  - Chief Allan Adam, Athabasca Chipewyan First Nation, and Chief Roxanne Marcel, Mikisew Cree First Nation, Foreword to the *As Long as the Rivers Flow Report* (Candler et al., 2010, p. 7)

The cultural flow example explored in this thesis was developed by the Mikisew Cree First Nation (MCFN) and Athabasca Chipewyan First Nation (ACFN) and presented in their report titled *As Long as the Rivers Flow: Athabasca River Knowledge, Use and Change* (*As Long as the Rivers Flow Report*). MCFN and ACFN are two First Nations with territories in the Lower Athabasca River region in northern Alberta, Canada. The Lower Athabasca River is an important freshwater source for the upstream surface mineable oil sands industry, which in the early 1990s was forecasted to experience rapid growth lasting into the 2000s. In response to the industry forecasts, the Government of Alberta (GoA), with the federal department of Fisheries and Oceans Canada (DFO), convened a multi-sectoral, consensus-based working group called the Cumulative Environmental Management Association (CEMA)[13] to determine the instream flow needs of the Lower Athabasca River.[14] The instream flow needs were to inform

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[13] CEMA was guided by the *Regional Sustainable Development Strategy for the Athabasca Oil Sands Area* throughout its operation, remaining a distinct body from the Athabasca Watershed Council. The Athabasca Watershed Council was established in August 2009 as a watershed planning and advisory committee under Alberta's *Water for Life Strategy* (see https://awc-wpac.ca/about-us/) and did not have a role in SWQMFLAR development. Further details about CEMA and its work are provided in Chapter Four.

[14] In this thesis, the terms instream flow needs, environmental flows, and environmental flow assessments are used that warrant definition and explanation of how they are related:
  - Instream flow needs is the term used in this thesis when referring to CEMA's work to be consistent with documents prepared as part of CEMA's work and by the GoA for the Lower Athabasca River. To CEMA, the instream flow needs were the flow regime needed for full, long-term protection of the Lower Athabasca River aquatic ecosystem as described in section 4.2.1 that over time was expanded to include Indigenous river uses.

development of the first regional surface water quantity policy that was to regulate consumptive water use from the Lower Athabasca River by the surface mineable oil sands industry. MCFN and ACFN participated in CEMA during the early years, but they withdrew their membership over their concerns that CEMA's governance structure afforded them little influence to have their interests met (Tanner, 2008). CEMA continued developing policy recommendations and submitted them to the GoA and DFO in 2010, after which the provincial government led the drafting the *Surface Water Quantity Management Framework for the Lower Athabasca River* (SWQMFLAR). After the CEMA's work was complete, MCFN and ACFN in conjunction with the Firelight Group continued to shape the development of the SWQMFLAR by assessing their cultural flow needs and introducing the ANF in 2010 in their report entitled: *As Long as the Rivers Flow Report* (Candler et al., 2010).

ANF consisted of a suite of tools that were designed to prevent water withdrawals by the surface mining oil sands industry from impairing the navigability of the Lower Athabasca River from the perspective of MCFN and ACFN (Candler et al., 2010; Carver, 2014). The First Nations considered river navigability to be an important condition affecting the extent to which they could exercise their Aboriginal and treaty rights to hunt, trap, and fish in ways that were meaningful to them (Candler et al., 2010). When river flows were higher, MCFN and ACFN found the waterways to be more easily and extensively navigated by the outboard motorboats commonly used in their community for hunting moose and building cabins, which the First Nations perceived as meaningful exercise of their Aboriginal and treaty rights. Conversely, when river flows fell to a flow rate that MCFN and ACFN termed the Aboriginal Extreme Flow (AXF), MCFN's and ACFN's citizens experienced what they described as extreme disruption in their ability to exercise their rights to hunt, trap, and fish in ways meaningful to them (Candler et

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- Environmental flows are becoming more commonly used term in literature than the related term instream flow needs (Horne et al., 2017); therefore, environmental flows are used in this thesis to situate the research and its findings in existing literature. Environmental flows in this thesis are the flow regimes needed to sustain aquatic ecosystems which, in turn, support human cultures, economies, sustainable livelihoods, and well-being, which is adapted from Arthington et al. (2018).
- Environmental flow assessments in this thesis refer to the process for determining the flow regime to meet ecological, social, cultural, and economic objectives represented by environmental flows (adapted from Horne et al., 2018). Environmental flow assessments in this thesis are collaborative processes that use different knowledges such as Western Science and Traditional Knowledge. In this thesis, the process for determining instream flow needs is considered an environmental flow assessment.

al., 2010). The AXF was a tool within the ANF suite that was proposed by MCFN and ACFN as a water withdrawal cutoff limit for the surface mineable oil sands industry. ANF also included a river navigability index to monitor the impacts of oil sands mining water withdrawals from the Lower Athabasca River on river navigability in support of the exercise of Aboriginal and treaty rights (Carver, 2014). MCFN and ACFN expected that the GoA would either directly apply ANF in the SWQMFLAR as they proposed or, if the GoA determined that modifications were needed, ANF would be modified in collaboration with MCFN and ACFN so that they could influence how their interests were met in water policy.

The GoA chose to not apply the ANF in ways expected by MCFN and ACFN, leaving MCFN and ACFN frustrated. Specifically, the GoA neither adopted the AXF nor the river navigability monitoring index, and instead devised an alternative river navigability monitoring tool only (GoA, 2015). Furthermore, the GoA did not collaborate with MCFN and ACFN during development of the GoA's river navigability monitoring tool. MCFN and ACFN wanted to understand why the GoA chose a course of action that differed from their proposal for the ANF because, to the First Nations, the GoA's approach failed to meet their river navigability interests. MCFN and ACFN believed that understanding the influences on the GoA's adoption of ANF would open the dialogue necessary for the First Nations and GoA to collaboratively advance ANF into policy in mutually acceptable ways.

In addition to contributing empirical insight into why quantified cultural flows are rarely being adopted by state governments (section 1.0), exploring ANF is helpful because it is a novel example of a cultural flow. The ANF offered one approach to assessing cultural flow needs for Indigenous waterscapes at the regional rather than the more commonly researched local level. Also, research into cultural flows for industrialized but unregulated rivers, the type of river for which ANF were assessed, is less prevalent in the literature than for regulated rivers despite consumptive water uses contributing to the degradation of river health (Bobbi et al., 2014). Documenting cultural flows with different characteristics such as ANF can support macro-level research that identifies generalizable patterns in how cultural flows are used and perceived by state governments and Indigenous peoples. The generalizable patterns observed through the documentation of diverse cultural flows example can inform the ongoing evolution of this

innovative concept as a freshwater policy tool that can help overcome the marginalization of Indigenous peoples.

1.2 Ethical Space as the Theoretical Lens

> *People have to take up the idea [of ethical space] and do something with it…which is quite different than just talking about the idea*
>   - Willie Ermine (Different Knowings, 2011, timestamp 3:43:3:54)

Ermine's (2007) ethical space was applied as the theoretical lens in this thesis. With the relationship between Indigenous and settler peoples in Canada in mind, Ermine (2007)[15] conceived of ethical space as a cross-cultural space in which peoples with contrasting worldviews deliberately choose to engage each other through empathetic and respectful dialogue. Peoples within an ethical space seek a deep understanding of and appreciation for their distinctiveness by reflecting on their worldviews, socio-cultural and legal histories, norms, practices, attitudes, and biases (Ermine, 2007). When peoples know and appreciate their distinctiveness, they are better positioned to live according to their values (Ermine, 2007). As peoples reflect on their distinctiveness, awareness of the uniqueness of others should grow, leading to the explicit acceptance of human diversity (Ermine, 2007). When human diversity is accepted, peoples can turn their attention to exploring how their status quo intentions, norms, attitudes, and values may be doing harm to others (Ermine, 2007). Exploring differences between peoples and how different peoples relate to each other generates tension that Ermine (2007) argues can be overcome through respectful dialogue between peoples who do not position themselves as superior to others. Respectful dialogue opens the possibility for mutual cross-cultural understanding, changed relationships, and innovative solutions for problems faced across distinct peoples (Different Knowings, 2011; Ermine, 2007). In short, an ethical space is where

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[15] Distinguishing Ermine's 2007 conception of ethical space is necessary because critiques of his earlier work suggest that the concept of ethical space may have evolved over time. Ermine introduced his conception of ethical space in 2005 at the National Gatherings on Indigenous Knowledge conference in Rankin Inlet, Nunavut, but I was unable to obtain a copy of presentation. Without the 2005 presentation, I was unable to confirm whether and how Ermine's 2005 and 2007 conceptions of ethical space differed. In case Ermine's ethical space conception evolved over time, the application in this thesis of Ermine's 2007 conception needed to be specified.

cross-cultural, respectful dialogue occurs to effect change in matters of mutual interest in ways deemed mutually appropriate by the peoples within the space.

Applying ethical space as the theoretical lens to explore the significance and adoption of cultural flows is appropriate because ethical space and cultural flows have overlapping intentions. First, both ethical space and cultural flows are premised on continued relationships between Indigenous and settler peoples. Not all people agree with the appropriateness of continued relationships between Indigenous and settler peoples, preferring an assimilative or segregated relationship. Ermine (2007) expressed a different view through ethical space, explicitly orienting Indigenous and settler peoples towards a continued relationship, but one based on symmetrical power. Cultural flows imply the need for an ongoing relationship between Indigenous and settler peoples because they seek greater recognition and accommodation of Indigenous peoples' interests in cross-cultural freshwater governance arenas. Thus, the ethical space and cultural flows are aligned in their promotion of reconciliation rather than segregation between Indigenous and settler peoples.

Second, ethical space and cultural flows both seek to achieve mutual cross-cultural understanding to effect change for the benefit of Indigenous peoples. The standpoint that Indigenous and settler peoples are often culturally distinct underpins ethical space (Ermine, 2007) and cultural flows (Jackson, 2017), meaning that achieving cross-cultural understanding is needed if relationships between them are to continue. Cultural flows are concerned with achieving place-specific mutual cross-cultural understanding of Indigenous interests in freshwater so that they may be accommodated within freshwater governance arenas (Murray Lower Darling Rivers Indigenous Nations [MLDRIN], 2007). Ethical space is not subject matter specific, instead seeking societal level mutual cross-cultural understandings between Indigenous and settler peoples to overcome their socio-economic disparities and power differentials (Ermine, 2007). To Ermine, societal level mutual cross-cultural understanding depends on reflexivity by individuals in their daily lives (Different Knowings, 2011). For some people, engagement with Indigenous peoples about their freshwater interests is part of their daily lives, suggesting that reflexivity during the assessment and consideration of cultural flows could assist with the development of place-specific ethical spaces over freshwater. Within the place-specific ethical spaces over freshwater, Indigenous peoples and settler peoples reach mutual cross-cultural

understanding, becoming poised to respectfully collaborate to solve local freshwater problems in ways that are mutually beneficial. Cross cultural mutual understanding achieved at the local level through cultural flows can in turn provide momentum for the establishment of societal level mutual cross-cultural understanding to effect wider-reaching change.

Third, ethical space and cultural flows are both concerned with enhancing the well-being of Indigenous peoples. Ermine (2007) defines ethics as "the capacity to know what harms or enhances the well-being of sentient creatures" (p. 195), and it is this capacity that ethical space attempts to build through reflexivity and respectful reciprocal interrogation of peoples' assumptions, norms, practices, attitudes, and biases. Innovations that emerge from an ethical space should then be concerned with human well-being (Ermine, 2011). Well-being is an important outcome of cultural flows which are about "improving the spiritual, cultural, environmental, social and economic conditions of Indigenous Nations" (MLDRIN, 2007, n.p.). Hence, cultural flows and ethical space share in their objective of Indigenous peoples' improved well-being.

In sum, ethical space and cultural flows share similar intentions, including continued relationships between Indigenous and settler peoples, achievement of mutual cross-cultural understanding and enhanced well-being of Indigenous peoples. Their shared intentions provide the foundation for exploring cultural flows through the theoretical lens of ethical space.

Exploring the significance and adoption of cultural flows through an ethical space lens seeks to understand how cultural flows may be advanced so that Indigenous peoples are no longer marginalized in freshwater governance such that it becomes an ethical space. To operationalize the application of ethical space as the theoretical lens to this research, the different elements of Ermine's ethical space were extracted from his writings (Ermine, 2007) and presentations (Different Knowings, 2011) and expressed as dimensions of the Ethical Space Framework (ESF). Four ESF dimensions were identified (Figure 1.1):

First ESF dimension: Affirmation of the existence of diverse human communities unique in their histories, languages, knowledge systems, values, interests, laws, philosophies, and social, economic, and political realities.

Second ESF dimension: Deliberate agreement amongst peoples with differing worldviews to engage with each other.

Third ESF dimension: Exploration of one's own perspectives, worldviews, assumptions, norms, practices, and attitudes so that one can come to know and appreciate one's own distinctiveness, how one perceives other people, and the implications of those perceptions.

Fourth ESF dimensions: Cooperative interrogation of peoples' perspectives, worldviews, assumptions, norms, and attitudes of peoples leading to mutual cross-cultural understanding (Ermine, 2007). Areas of partial or complete mutual cross-cultural understanding are commonalities that provide an entry point for relationship building based on empathy and openness to different perspectives and experiences so that new ideas may emerge (Different Knowings, 2011; Ermine, 2007).

The four ESF dimensions were uniquely applied as an organizing frame for this thesis and guide to the analysis and presentation of findings (see sections 1.3 and 1.4), linking the two stories told through the two sets of research questions that this thesis explored.
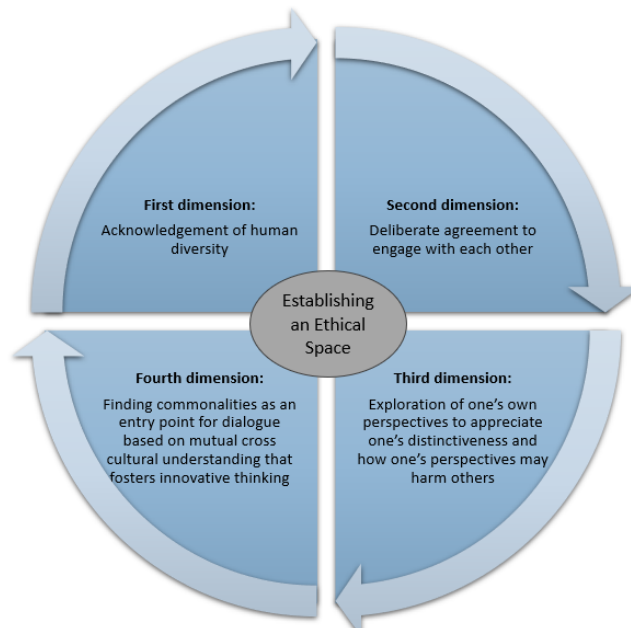
Figure 1.1: The author's visualization of the four dimensions of Ermine's Ethical Space Framework

1.3   Research Purpose and Questions

If today's water experts are themselves resistant to examining how Indigenous systems can contribute to water governance, we need more efforts in sharing Indigenous water beliefs, governance practices and success stories in research literature and indeed, more broadly across society.
        - Lori Bradford, Nicholas Ovsenek & Lalita Bharadwaj (2017, p. 293)

The purpose of this qualitative thesis, as decided collaboratively by Indigenous research partners and our University research team, is two-fold: (i) to describe ANF and its significance to MCFN and ACFN; and (ii) to explore the adoption of ANF by the GoA as part of surface water quantity policy development for the Lower Athabasca River region in Alberta, Canada. To achieve the purpose, two sets of research questions were explored using the ESF as the overarching theoretical lens and Community-Based Participatory Research (CBPR) as the overarching methodology. The ESF encourages peoples who are engaging with each other to explore and reflect on their own perspectives and the implications of those perspectives, which in this thesis connected the two research questions because the significance and adoption of ANF are different but related aspects of the perspectives of our Indigenous research partners. First understanding the significance of ANF to its Indigenous creators provided additional lines of inquiry into the influences on the adoption of ANF that deepened the insights gained through this research. CBPR was applied as the overarching methodology because it consists of tools to directly engage research participants in the research process, thereby promoting egalitarian and collaborative research. Egalitarian and collaborative interactions between peoples is a key goal of the ESF and were important to the Indigenous peoples engaged as partners in this research, including MCFN, ACFN, and the Fort Chipewyan Metis (FCM). Hence, combining the ESF and CBPR provided scholarly rigour in ways that respected our Indigenous research partners.

Research Question 1: Why are Aboriginal Navigation Flows significant to the Indigenous communities that helped develop them?

> *1a. Why is river navigability important to the Indigenous peoples of the Peace-Athabasca Delta?*
> *1b. Why were the Aboriginal Navigation Flows developed?*

Research Question 1 was added to this thesis at the request of MCFN and ACFN. Indigenous peoples' perspectives into the significance of ANF were explored by combining CBPR with constructivist grounded theory methodologies through the theoretical lens of the ESF. Understanding the significance of ANF to the Indigenous peoples of the Peace-Athabasca Delta was consistent with the third ESF dimension, which in part asks that peoples engaging with each other explore their own perspectives so that they can appreciate their distinctiveness. Through Research Question 1, Indigenous peoples' rationales for choosing river navigability as the interest to quantify in terms of river discharges (1a) and developing ANF (1b) were explicated. Findings for Research Question 1 provided additional lines of inquiry for Research Question 2.

Research Question 2: How can adoption of the Aboriginal Navigation Flows in surface water quantity policy be advanced in ways mutually acceptable to state governments and Indigenous peoples?

> *2a. What were the barriers and drivers to the adoption of the Aboriginal Navigation Flows in surface water quantity policy from the Indigenous community's perspective?*
>
> *2b. What were the barriers and drivers to the adoption of the Aboriginal Navigation Flows in surface water quantity policy from the state government representatives' perspective?*
>
> *2c. What were the commonalities between the perspectives of the state government representatives and Indigenous peoples?*
>
> *2d. What were the patterns in the commonalities between the perspectives of the state government representatives and Indigenous peoples?*

Research Question 2 was cooperatively shaped by the Indigenous research partners and our University research team, emerging from MCFN's and ACFN's deep need to preserve the navigability of their waterscape for future generations. Understanding how ANF may be advanced in ways that are mutually acceptable to Indigenous peoples and state government was achieved by applying the Implementing Innovation Framework (IIF) as a tool to understand

influences on adoption of innovations. The IIF is a framework of nested influences on how a new idea, or innovation, is advanced, and those influences can either inhibit (barriers) or facilitate (drivers) the advancement of an innovation, depending on their manifestation. Application of the IIF was guided by the ESF as the overarching theoretical lens and CBPR as the overarching methodology. The third ESF dimension requires a deep understanding of the different perspectives held by peoples engaging with each other. Therefore, the perspectives of Indigenous community and government representatives on the barriers to and drivers of ANF adoption by the GoA were explored and presented as separate narratives (2a and 2b). The two narratives consist of separate populations of the IIF for each of the barriers and drivers identified by the Indigenous community and government representatives, respectively termed Community Participants and Government Participants. Under 2c, the Community Participant and Government Participant narratives were compared to identify commonalities in the barriers and drivers within each narrative as required by the fourth ESF dimension. Commonalities are understood in this thesis to be the barriers and drivers from the Community Participant and Government Participant narratives that partially or fully converged. Stated differently, commonalities in this thesis are the drivers or barriers, or elements of barriers and drivers, found in both narratives. Although the commonalities represent a subset of influences on ANF adoption, they provide an entry point for respectful and empathetic dialogue between MCFN and ACFN and the GoA because they are known by all groups (Ermine, 2007). Insights gained under 2c were extended through 2d, which identified patterns in the commonalities to reveal higher level actions that may be taken to overcome the barriers and enhance the drivers to ANF adoption. Collectively, the four explorations under Research Question Two revealed a pathway to advance ANF in ways mutually acceptable to governments in Canada and Indigenous peoples.

1.4 Limitations and Challenges

Qualitative research is challenging, dive in
    - Colleague, School of Environment and Sustainability, University of Saskatchewan

Limitations of relationship building with research participants and focussing on commonalties through the ESF and challenges with confidentiality measures emerged during this

research. The deep explorations undertaken in this thesis were partially dependent on a diverse group of research participants feeling comfortable sharing their perspectives with me, which partly depended on the rapport that I was able to establish with them. In this research, stronger relationships with research participants representing our Indigenous research partners (Community Participants) were built than with provincial and federal government representatives (Government Participants). The weaker relationships with Government Participants stemmed primarily from the retrospective nature of this research that examined the adoption phase of an already completed policy process. Consequently, I had few opportunities to attend meetings or other events at which Government Participants gathered so that we could become acquainted outside the interview setting. Government Participants did not provide any direct feedback on whether my weaker relationships with them created any discomfort during interviews, but my weaker relationships with them may have limited the depth of the Government Participants' shared perspectives. The breadth of Government Participants' perspectives collected was also limited because few government representatives agreed to participate in this research, instead referring me to Alberta Environment and Parks, the provincial department responsible for surface water quantity management of the Lower Athabasca River. Together, the potentially limited depth and limited breadth of perspectives collected from Government Participants may have limited the comprehensiveness of the Government Participant narratives on barriers and driver to the GoA' adoption of ANF. To help overcome the limitation in data collection through interviews, greater emphasis was placed on data collection from documents and interactive data validation with Government Participants.

The application of the ESF in this thesis focusses on the commonalities between the perspectives shared by Indigenous community and government representatives, which omits the factors that differed between the narratives from the analysis. This limitation with focussing on commonalities cannot be overcome, but by providing the complete narratives in Chapter Six, the omitted factors are made clear. Readers of this thesis can examine the omitted factors to inform future studies.

Pseudonym use and general names for groups of research participants, which were necessary for confidentiality, were frustrating to some research participants and leaders of the Indigenous research partners. Some research participants from federal and provincial

government organizations disagreed with the use of Government Participants as the label for the group of government representatives and associates that shared their perspectives during interviews. For example, one individual expressed concern that their status as a former government employee means that their perspective does not represent that of the government (i.e. the information that they shared may have been different if they were still a government employee). Attempts were made to find alternative labels to Government Participants but dividing the Government Participants into smaller groups each with their own label increased the risk that individuals may be identified and linked to the quotes used in the following chapters of this thesis. Since privacy was an important concern for all Government Participants, the generic label of Government Participants was maintained.

Some Community Participants and leaders of the Indigenous research partners expressed concern with the use of pseudonyms rather than personal names in this thesis. Pseudonyms were perceived as disrespectful by some people involved in this research because anonymity undermined the data validation processes used by Elders and Indigenous leaders. Data validation, according to some Elders and leaders, occurs when people are willing to speak in front of others who can then respond by voicing their own perspectives. To respect these cultural norms, the video being produced about boating and river navigability with Indigenous research partners will identify people by their names (see section 3.2.2). However, pseudonyms are used in the thesis because two Community Participants chose to remain anonymous and their identities may have been exposed if pseudonyms were not used for all Community Participants.

1.5   Research Premises

Reflecting critically on our situation is part of our situation. It is a feature of the peculiar way we belong to the world. It is not some impossible light-in-the-refrigerator attempt to scrutinize ourselves when we are not there
  - Terry Eagleton, n.d.

Reflexivity, essential in qualitative research generally, was vital to our Indigenous research partners. The Indigenous research partners described how Elders are hurt by researchers who ask Elders to share their stories and knowledge but never share their own views. One-sided sharing was hurtful to Elders because it was perceived as taking something away from the Elders

without giving anything back. During my time in Fort Chipewyan, I shared personal stories such as experiences I had as a child and about the places I have lived. I also answered questions that people from Fort Chipewyan posed to me, which ranged from personal to philosophical inquiries. Over time, I reflected on the questions and the responses that I gave in the moment and came to understand that four premises shaped my perceptions of knowledge gaps within the literature and the nature of the research questions I pursued. The four premises are explained below.

Premise 1: Relational reconciliation between state governments and Indigenous peoples is required.

I prefer relational reconciliation over other forms of reconciliation. While in Fort Chipewyan, people expressed a range of perspectives on whether federal and provincial governments should exist, segregation of Indigenous and settler peoples, and whether all lands in Canada should be returned to Indigenous peoples. These perspectives were shared within the context of how can and should relationships with Indigenous peoples be strengthened. These conversations prompted me to reflect on questions such as: (i) What would Canada be like without any state governments? and (ii) How and who decides who is Indigenous or not? I do not believe in segregation of peoples or the dismantling of state governments. I prefer that Indigenous peoples and settler peoples in Canada find ways to live together in a permanent and mutually uplifting relationship recognized as being between nations.

To me, a vital part of nation-to-nation relationship building is reconciling perspectives on when Indigenous peoples were harmed by colonialism. Residents of Fort Chipewyan talked about being harmed by existing laws, policies, and social norms as a live, daily issue. This perspective contrasts sharply with assertions that I hear in other parts of my life that harms to Indigenous peoples occurred in the past. Many existing laws and policies, and not just the *Indian Act*, continue to harm Indigenous peoples, and all levels of government have a responsibility to understand and prevent the continuation of those harms by changing laws and policies. Changing rules in this way will encourage corresponding changes in social norms such that relationships between nations become deeply and permanently altered.

Premise 2: Relational reconciliation requires strong relationships between peoples around healthy freshwater.

The findings of LaBoucane-Benson et al. (2012) resonated with me: state-Indigenous relationships and freshwater health are positively related.   Since freshwater plays a central role in Indingeous and settler societies within Canada, degraded freshwater create tension within and between groups of people who fear the loss of freshwater. Improving the health of those waters should then ease tensions and restore relationships between and within groups of people (Bryan, 2017). Correspondingly, stronger relationships between peoples will provide opporunities for them to come together to solve complex problems using a broad range of ontologies, epistemologies, experiences and ideas. Due to their positive relationship, my hope is that simulatenaously strengthening relationships and improving the health of freshwater will reinforce each other such that each aspect builds momentum in the other until they become automatic within freshwater governance arenas.

Premise 3: Advancement of cultural flows in ways mutually acceptable to the First Nations and GoA is preferred over unilateral acceptance.

Underpinning this fourth premise about the necessity of mutually advancing cultural flows is my general belief that people live in interconnected spaces that require individuals or their organizations to accommodate each other. Rivers are intersecting spaces, flowing across biophysical and human delineated boundaries and linking different peoples and ecosystems together in diverse communities. The interdependent linkages within riverine socio-ecological ecosystems require that riverine community members accommodate each other because rivers can only flow in one way at any one point in time and space.

1.6   Layout of the Thesis

Calvin: I think we've got enough information now, don't you?
Hobbes: All we have is one "fact" you made up.
Calvin: That's plenty. By the time we add an introduction, a few illustrations, and a conclusion it will look like a graduate thesis.
   - Calvin and Hobbes by Bill Watterson, October 31, 1989

This thesis has eight chapters organized using the ESF (Table 1.1) and includes at least one fact (not made up), an introduction, illustrations, and conclusion as recommended by Calvin. Chapters One and Two provide the theoretical lens and conceptual frameworks that situate this research within existing literatures (Charmaz, 2014) and establish the need for research into the significance and state government adoption of cultural flows using ANF as an example. Weaved throughout the first two chapters is the acknowledgement that Indigenous peoples are culturally and legally distinct from settler peoples within Canada, fulfilling the first ESF dimension that requires acknowledgement of the diversity of peoples.

Chapter Three sets out my rationale for combining CBPR with constructivist grounded theory as a research strategy within a constructivist-interpretative approach. As part of the methodology, the process for arriving at a formal agreement between the university and our Indigenous research partners is described, demonstrating fulfillment of the second dimension of the ESF which requires peoples to deliberately agree to engage with each other.

Chapter Four provides a narrative account of the surface water quantity policy process into which ANF were introduced, contextualizing the findings for both sets of research questions. The narrative account contributes to the deep explorations of perspectives, assumptions, norms, and practices that are part of the third ESF dimension.

Chapter Five presents the findings for the first set of research questions into the significance of ANF. The findings for the first set of research questions informed the inquiries related to the second set of research questions and were part of the deep explorations of the perspectives, assumptions, norms, and practices that are part of the third ESF dimension.

Chapters Six and Seven present the results for the second set of research questions. In Chapter Six, the barriers and drivers that influenced the GoA's adoption of ANF from the perspectives of Government and Community Participants are presented as four populations of the IIF. Presenting the Government and Community Participants' perspectives separately aligns with the deep explorations of the different perspectives, assumptions, biases, norms, and practices under the third ESF dimension. In Chapter Seven, the sets of barriers and drivers are compared to identify commonalities under the fourth ESF dimension that were subsequently ranked according to their relative influence on the GoA's adoption of ANF. Chapter Seven ends with a description of the patterns in which the barriers and drivers occurred. Together, the

factors and patterns of factors identified in Chapters Six and Seven, respectively, provide the results of applying the ESF and IIF in combination to understand the influences on the GoA's adoption of ANF.

Chapter Eight, the discussion and conclusion chapter, answers the research questions. For the first set of research questions, ways in which cultural flows can make environmental flow assessment for free-flowing rivers more meaningful for Indigenous peoples are identified. For the second set of research questions, the findings are interpreted to understand the institutional patterns affecting ANF adoption so that insight can be gained into measures that can be taken to advance cultural flows more broadly. Suggestions for future research are then provided followed by an evaluation of the research using Charmaz's (2014) criteria for a constructive grounded theory study. Chapter Eight ends with concluding thoughts on the advancement of cultural flows as a policy tool may establish freshwater governance as an ethical space.

Table 1.1: Thesis layout presented according to the Ethical Space Framework

Chapter No.	Chapter Purpose	Relationship to the Ethical Space Framework	Chapter Content
1	Introduction	Together, Chapters 1 and 2 fulfil the first ESF dimension requiring acknowledgement of human diversity by situating this research in the cultural and legal distinctiveness of Indigenous peoples within Canadian society.	• Introduces the research topic of cultural flows and how cultural flows are situated within the broader cross-cultural flow governance literature. • Presents the purpose and rationale for the research, including the knowledge gaps that this research will help fill. • Establishes the Ethical Space Framework as the overarching theoretical lens of the research and the guide to presenting research findings. • Presents the limitations and premises of the research.
2	Literature Review		• Provides a conceptual framework for the research, including a synthesis of literature (i) that critiques the ESF; (ii) on how ethical space has effected change in natural resource management; (iii) on advancements made in each of the ESF dimensions within freshwater governance for the surface mineable oil sands region; (iv) on the genesis, purpose, diffusion, and critiques of cultural flows; and (v) on freshwater governance and environmental flows that provide insight into the adoption of cultural flows in cross cultural contexts. • Explains the Implementing Innovation Framework in preparation for its application to Research Question 2 into the influences on provincial government adoption of ANF
3	Methodology & Standpoint	Fulfills the second ESF dimension requiring deliberate agreement amongst peoples to engage with each other by describing the nature and formalization of the relationship with the Indigenous research partners.	• Describes and provides rationales for my methodological choices within a qualitative, constructivist-interpretative approach. • Reveals my reflections on events that helped shape how and why this research was undertaken
4	Findings	Chapters 4, 5 and 6 fulfill the third ESF dimension requiring a deep exploration of the perspectives and attitudes of the peoples populating an ethical space. • Chapters 4 and the government narrative in Chapter 6 provide contextualized insight into the perspectives held by government	• Provides a contextualized narrative of the fifteen-year policy process leading to the release of the Surface Water Quantity Management Framework for the Lower Athabasca River (SWQMFLAR) • Details the emergence and content of MCFN's and ACFN's cultural flow termed ANF
5	Findings		Presents the findings for Research Questions 1a and 1b into the significance of ANF, including the importance of river navigability to MCFN,

Chapter No.	Chapter Purpose	Relationship to the Ethical Space Framework	Chapter Content
		representatives on the adoption of ANF. • Chapters 4, 5, and the community narrative in Chapter 6 provide contextualized insight in the Indigenous peoples' perspectives on ANF and the influences on the adoption of ANF.	ACFN, and the Fort Chipewyan Métis, and their rationale for developing ANF.
6	Findings		Presents the findings for Research Questions 2a and 2b by populating the Implementing Innovation Framework with the influences on the Government of Alberta's adoption of ANF as perceived by federal and provincial government representatives (Government Participants) and First Nations' citizens and associates (Community Participants). The populations of the IIF contain the factors found to influence ANF adoption regardless of their relative degree of influence so that the comparisons under the fourth ESF dimension (Chapter 7) are completed for unabridged narratives.
7	Findings	Chapters 7 and 8 fulfill the fourth ESF dimension that seeks to find commonalities between and interrogate perspectives as an entry point for dialogue that will allow different peoples to reach mutual cross-cultural understanding, learn from each other, and collaboratively develop innovative solutions.	Presents the findings for Research Questions 2c and 2d. Specifically, Chapter 7: • compares the narratives presented in Chapter 6 to understand where the barriers and drivers from each narrative partially or fully converge. The partial and full convergences are labelled commonalities in this thesis. • identifies the patterns in the commonalities using the three categories of factors of the Implementing Innovation Framework.
8	Discussion and Conclusion		• Provides a synthesis of the research findings woven together with relevant literature and my own interpretive perspectives to answer both sets of research question. Specifically, how cultural flows can contribute to making environmental flows assessments for free-flowing rivers meaningful and the institutional patterns affecting ANF adoption are discussed. • Provides recommended measures and concluding thoughts for advancing ANF in ways mutually acceptable to federal and provincial and Indigenous peoples • Suggests ideas for future research • Provides an evaluation of the research using Charmaz's (2014) constructivist grounded theory criteria

CHAPTER 2 – LITERATURE REVIEW

2.0 Introduction

Chapter Two is a literature review, which in constructivist grounded theory studies provides "an opportunity for researchers to summarize and evaluate the literature as well as situate themselves in relation to current discourses" (see El Hussein et al., 2017, p. 1200; Charmaz, 2014; Ferguson, 2019; Ford, 2010). The literature review begins in section 2.1 by establishing the ESF as a framework that may be used to effect change for Indigenous peoples within freshwater governance arenas. The ability of the ESF to effect change is established by addressing its critiques and identifying examples of where it has facilitated positive change for Indigenous peoples. To establish the ESF as an appropriate framework for use in inquiries related to freshwater governance, examples of activities and movements are provided that demonstrate Indigenous peoples and state governments are poised to begin engaging with each other over freshwater in ethical spaces. Section 2.1 ends with the application of the ESF to the freshwater governance arena into which ANF were introduced to demonstrate why freshwater governance within the Lower Athabasca River region is not a fully developed ethical space. Together, the subsections making up section 2.1 are a foundation to begin responding to Ermine's challenge to Indigenous and settler peoples to use the ESF to effect change in matters like freshwater that are important to the peoples engaging with each other in cross-cultural spaces.

Section 2.2 builds on the assertion that the Lower Athabasca River region is not yet an ethical space by synthesizing and critiquing literature on cultural flows, the underpinning concept of this work. The synthesis first examines the genesis, meaning, benefits, and critiques of cultural flows to understand why the concept emerged, how the concept has been defined in different contexts, and has gained some traction as a potential policy tool amongst some state governments and Indigenous peoples as a basis for the inquiry into the significance of ANF. Next, the synthesis of literature on the benefits and critiques of cultural flows combined with insights from the related topic of environmental flows adoption sensitizes the inquiries into the factors that influenced the adoption of ANF by the GoA. Together, the subsections of section

2.2 orient the research towards understanding cultural flows as a potential tool to facilitate the development of freshwater governance as an ethical space.

Section 2.3 introduces Steelman's (2010) Implementing Innovation Framework (IIF) as an analytic tool to understand the barriers and drivers, collectively called factors, that influenced the GoA's adoption of ANF. Critical parts of section 2.3 include the description of the IIF and how an innovation implementation framework can be applied to an innovation adoption case as examined in this thesis. Section 2.3 ends by describing how the IIF is applied under the ESF to understand the factors that influenced the GoA's adoption of ANF. The subsections of section 2.3 together provide insight into how factors and patterns in the factors can be identified to facilitate the advancement of cultural flows as a tool to help overcome the marginalization of Indigenous peoples within freshwater governance arenas.

Chapter Two ends with a summary of the literature review that was reflected upon as part of data analysis to inform the findings for both sets of research questions into the significance and adoption of ANF.

2.1   Actioning the Ethical Space Framework to Effect Change in Freshwater Governance

2.1.1 Critiques of Ethical Space

Ermine's concept of ethical space is critiqued for emphasizing divergences between peoples and for being too simplistic. Durnin (2011) contends that Ermine's emphasis on delineating differences between peoples will widen the divide between Indigenous and settler peoples in governance arenas that privilege Western Science[16]. Instead of emphasizing differences, Durnin (2011) recommends that focus be placed on the similarities between knowledge systems to orient peoples with differing worldviews towards finding common ground on matters of mutual interest. Understanding and appreciating differences is a vital dimension of

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[16] Western Science in this thesis is a knowledge system that decontextualizes objects of study, separating people from nature so that nature can be objectively known (Anderson et al., 2019). Important to note about this definition is that it excludes constructivist-interpretivist orientations, which was done because environmental flow assessments were typically grounded in the biophysical sciences (Anderson et al., 2019).

ethical space (Ermine, 2007), but Ermine also asserts that finding common ground is necessary for establishing ethical space (Different Knowings, 2011, timestamp 6:02-7:17). Ermine's common ground refers to conditions of engagement including agreement on principles guiding relationship-building amongst peoples within the ethical space and mutual appreciation of all peoples as linked through their humanity (Different Knowings, 2011; Ermine, 2007). Ermine's conditions of engagement and Durnin's focus on similarities between knowledge systems constitute different forms of common ground, but these authors share in their search for commonality that can facilitate collaborative and innovative problem solving amongst culturally diverse peoples. The identification of commonalities is a critical part of this thesis as commonalities represent areas of partial or complete mutual cross-cultural understanding between Community and Government Participants that provide an entry point for dialogue on the advancement of cultural flows in mutually acceptable ways.

Zinga and her cross-cultural team from Brock University and Six Nations Police Services (2009) provide a different critique to that of Durnin (2011), contending that Ermine's 2005 conception of ethical spaces as "automatically created" when peoples with differing worldviews encounter each other is too simplistic (p. 31). To Zinga et al. (2009), Ermine fails to recognize that ethical space is also purposefully and intentionally created through complex interactions between peoples who are individually and collectively questioning their motives, positions, assumptions, and biases about the people, processes, and matters within the space (Zinga et al., 2009). Interestingly, Ermine in his 2007 article asserts that ethical spaces do form automatically (Durnin, 2011; Ermine, 2007) but only after peoples with differing worldviews agree to engage with each other to cooperatively configure the principles that will guide their relationship (Ermine, 2007). Further, peoples engaging in ethical space must be deliberately reflexive and willing to interrogate their own and each other's perceptions, assumptions, biases, norms, and practices to achieve mutual cross-cultural understanding (Bullock et al., 2020; Ermine, 2007). Agreement to engage, reflexivity, and cooperative interrogation signify intentional and purposeful engagement. Thus, Ermine's 2007 conception of ethical space, which is applied in this thesis, converged with that of Zinga et al. (2009): ethical space is automatically created through purposeful and intentional complex interactions between different peoples (Ermine, 2007; Laurila, 2019).

Understanding ethical space as purposeful and intentional implies that peoples within an ethical space choose to respectfully engage with each other (Ermine, 2007; Zinga et al., 2009). Building respectful relationships between Indigenous and settler peoples requires that they "engag[e] in an ongoing, complex, and dynamic process grounded in a lifetime commitment, which occurs at the level of the individual, family, community, and nation" (Davis et al., 2017, p. 14). Transforming relationships between Indigenous and settler peoples at the societal level is not an easy feat, but there is hope. The website, *Transforming Relations,* documents almost 300 Canadian initiatives undertaken by Indigenous peoples, grassroots activists, universities, NGOs, church groups, and governments to advance conversations about and to improve the relationships between Indigenous and settler peoples in Canada (Davis et al., 2017). Many sectors within Canada are choosing to transform relationships between Indigenous and settler peoples, suggesting that, despite its critiques, research exploring the establishment of ethical spaces is warranted.

2.1.2 Effecting Change through the Ethical Space Framework

Ethical space is described by Schultz (2015) as a "space of possibilities" in which cross-cultural collaborative innovation is fostered to effect change in matters populating the ethical space (p. 3), but is the application of the ESF beneficial? Change catalyzed through the ESF has been explored mostly in the fields of education and health care, likely due in part to public scrutiny of ethics within these sectors as compared to other fields (Montoya & Richard, 1994; Gable, 2011). In the education field, Longboat (2010) drew upon the ESF to understand the extent to which an Indigenous resource program in a secondary school and outreach by an elementary school to the local Indigenous community improved opportunities for Indigenous students' academic success. Canadian health researchers used the ESF to develop culturally safe practices leading to a research plan for improving an Indigenous women cervical cancer screening policy (Zehbe et al., 2012), establish ethics protocols for health research in Indigenous communities (Brunger et al., 2014), and understand the barriers experienced by urban Indigenous peoples when attempting to access health services (Nelson & Wilson, 2018). Although not an exhaustive list, these examples demonstrate how ethical space can elucidate entrenched institutional barriers and improve access and safety for Indigenous peoples within the education

and health sectors. In short, innovations in education and health have emerged using ethical space, effecting beneficial change for Indigenous peoples.

Diffusion of the ESF into the practice and study of Canadian natural resource governance has also occurred, suggesting that testing its application in freshwater governance arenas in this thesis is warranted. One notable example where ethical space was explicitly used by practitioners of natural resource governance to change relationships with Indigenous peoples comes from Alberta's energy sector (Alberta Energy Regulator, 2017). The Alberta Energy Regulator and Piikani Nation Elders, using ethical space, embarked on what they described as an ongoing journey of listening, asking questions, and seeking cross-cultural understanding so that mutually acceptable decisions can be made about the development of Alberta's energy resources. In academe, ethical space conceptually informed research into decolonizing social relations over and with waterways shared by Indigenous and settler peoples (Stevenson, 2018). This thesis builds on these preceding examples of the use of ethical space in the oil and water sectors to further demonstrate how state governments and Indigenous peoples can move beyond discourse and change their relationship for the benefit of all peoples by applying the ESF.

2.1.3 Freshwater Governance as an Ethical Space

Cree Elder Fred Campiou asserts that freshwater is the "one binding thing [in the] relationship" between Indigenous peoples and the "rest of Canada" (Counselling Services of Alberta, 2013, timestamp 46:38-46:48), suggesting that freshwater is a vital matter around which ethical space could be developed. Freshwater binds diverse peoples together because of their shared dependency on it for life and well-being, and that dependency is manifested in peoples' responsibilities for and relationships with freshwater. Responsibilities for, and relationships with freshwater are exercised at different levels within Canadian society (Bakker & Cook, 2011). For example, individuals make choices about how they use their waterscapes, citizen groups monitor their local watersheds, and municipalities engage in freshwater conservation planning. Understanding how Indigenous peoples may be engaged ethically at all societal levels is important work, but it is also broad. This thesis focusses on the ethical spaces at the intersection of provincial and federal governments' and Indigenous peoples' responsibilities for and

relationships with freshwater when they choose to collaborate within state-led freshwater governance arenas.

In their management of freshwater, federal and provincial governments are limited by the division of powers set out in the Canadian *Constitution Act, 1982,* which does not directly reference freshwater (Bakker & Cook, 2011; La Forest, 1973). Instead, the constitutional division of powers means that the federal government's freshwater responsibilities, which fall under section 91, relate to fisheries, navigation, federal lands, and transboundary waters (*Constitution Act, 1982*; Bakker & Cook, 2011; La Forest, 1973). Provincial governments under section 92 are responsible for domestic and industrial freshwater supply, pollution control, non-nuclear thermal and hydroelectric power development, irrigation, and recreation within their borders (Bakker & Cook, 2011; La Forest, 1973). Historically, federal and provincial governments exercised their authorities related to freshwater based on the premise that freshwater is an infinite material good to be inventoried, used, and managed to achieve predictable socio-economic growth by unilaterally applying western scientific expertise and centralized management. (Biro, 2007; Brandes, 2005; Phare, 2009; Woo, 2001; Wilson & Inkster, 2018).

Recently, federal and provincial governments have shifted away from command-and-control of freshwater as a material good towards collaborative/participatory governance. The shift towards collaborative/participatory governance is a response to the environmental (e.g., declining native fish populations; polluted waterways) and socio-economic (e.g., overallocated basins; property losses from extreme flood events) problems attributed to command-and-control material management of freshwater (von der Porten et al., 2016). Collaborative/participatory governance (i) increasingly recognizes freshwater as something to be "shared with the environment" (Woo, 2001, p. 85) within hydro-social systems so that human wellness and ecological health are sustained (Daily, 1997; Everard, 2017; Gilvear et al., 2017; Linton & Budds, 2014; von der Porten et al., 2016); and (ii) incorporates locally-based, horizontally collaborative practices involving diverse state and non-state actors into historically vertical practices (von der Porten et al., 2016). This collaborative governance approach emphasizes learning over time, the benefits of using multiple knowledges to solve complex problems, and partial to full power-sharing, including consensus-seeking (von der Porten & de Loë, 2013;

Steelman, 2016). As federal and provincial governments shift to a governance approach, they are increasingly seeking the participation of Indigenous peoples in the governance of waterscapes important to Indigenous communities. Federal and provincial governments' pursuit of collaboration with Indigenous peoples offers an opportunity for a better understanding of Indigenous worldviews as part of freshwater governance and creates the possibility for establishing ethical spaces over freshwater.

Paralleling state governments' pursuit of collaboration with Indigenous peoples is Indigenous activism (e.g., protests, legal action) to secure enhanced roles in state government-led freshwater governance (Parsons & Fisher, 2020). Underpinning their desire for enhanced roles in freshwater governance is the need of some Indigenous peoples to continue to assert their Indigenous laws within their waterscapes (Parsons & Fisher, 2020). The breadth of Indigenous laws precludes a comprehensive discussion here, but they are understood to have existed prior to contact with settler peoples and were not extinguished through colonial processes (Borrows, 2019; Stevenson, 2018). Further, Indigenous laws guide how people live through stories that provide lessons and meanings (Borrows, 2019; LaBoucane-Benson, et al. 2012; Stevenson, 2018). Significant to this research are the Indigenous water laws governing some Indigenous peoples' reciprocal relationship with freshwater (Anderson, 2010; Cave & McKay, 2016; Laidlaw & Passelac-Ross, 2010; Phare, 2009; Simms et al., 2016; Yates, Harris & Wilson, 2017). The reciprocal human-water relationship provides freshwater for human use and places responsibilities on Indigenous peoples to care for the freshwater (McGregor, 2013; Phare, 2009; Wilson & Inkster, 2018). This sense of responsibility to care for water creates a sense of urgency amongst some Indigenous peoples at the individual and collective levels to collaborate with state governments within Canadian freshwater governance arenas for the wellness of people and freshwater (Basdeo & Bharadwaj, 2013; Cave & McKay, 2016; McGregor, 2013; Phare, 2009; Simms et al., 2016).

Since their responsibilities for and relationships with freshwater are bringing Indigenous peoples and state government together within Canada, there is a need to understand how cross-cultural collaboration within freshwater governance arenas may become ethical spaces. Kim (2016) observes that the governance approach does not necessarily deliver the desired mutually beneficial outcomes because of the continued "tendency for central governments to exert a

vertical, hierarchical influence as a hybrid nature of governance" alongside horizontal arrangements for citizen collaboration (p. 3548). The continued hierarchical influence of authoritative governments within governance approaches can disempower citizens by limiting the goals and strategies used by the collaborating groups to achieve their desired outcomes (Kim, 2016; Swyngedouw, 2005). Stated differently, a horizontal, networked governance approach is not inherently obstructive to achieving mutually beneficial outcomes for state governments and Indigenous peoples. Rather, the specific institutional arrangements used to operationalize a horizontal, networked governance approach can be problematic to ethical engagement with Indigenous peoples (Bakker & Cook, 2011; Kim, 2016; Swyngedouw, 2005). Given the potential mutual benefits of collaboration between state governments and Indigenous peoples (e.g., fulfillment of legal consultation obligations under treaties; use of multiple knowledge systems to enrich innovation in freshwater protections; conflict resolution), a better understanding of the institutional arrangements that support freshwater governance arenas becoming ethical spaces is needed (Bullock et al., 2020; Hanrahan, 2017; Kim, 2016; Nowlan & Bakker, 2010; Plummer, Armitage, & de Loë, 2013; Reo et al., 2017).

2.1.4 Applying the Ethical Space Framework to Surface Water Quantity Governance in the Lower Athabasca River Region

Establishing ethical space is contextual because state governments, Indigenous peoples, the matters of importance to them, and the environs in which they collaborate are diverse. In keeping with the contextual nature of ethical space, the four dimensions of the ESF are populated below for the freshwater governance arena in which ANF were used by the GoA to develop surface water quantity management policy for the Lower Athabasca River region. The population of the ESF is not exhaustive. Rather, examples of activities and events that enabled and hindered the crystallization of each ESF dimension are provided, showing that development of ethical space in the region is non-linear, iterative, and incomplete.

Many of the examples provided in the ESF population for the freshwater governance arena that considered ANF refer to CEMA. Chapter 4 provides more detail, but briefly, CEMA was a multi-stakeholder, consensus based forum convened by the GoA to develop environmental policies to manage the cumulative effects of oil sands developments in the Lower Athabasca

River region. One of CEMA's tasks was to determine the instream flow needs of the Lower Athabasca River and make consumptive freshwater use recommendations to inform surface water quantity policy development by provincial and federal governments. MCFN and ACFN participated in CEMA's early work alongside provincial and federal government agencies, environmental advocacy groups, oil sands companies, and other Indigenous groups with home territories potentially affected by oil sands development. CEMA's research and recommendations shaped the GoA's final approach to surface water quantity management in the Lower Athabasca River region, and therefore are pertinent to understanding the advancement of ethical space within the freshwater governance arena into which ANF were introduced.

2.1.4.1 First Dimension of the Ethical Space Framework

The first ESF dimension is affirmation of the existence of diverse human communities unique in their histories, languages, knowledge systems, values, laws, and philosophies. Within the state government-led freshwater governance arena into which ANF were introduced, the existence of diverse human communities has been affirmed in policy. Affirmation of human diversity is evident in Lower Athabasca River regional policies that, within the context of state government dominated processes, reference the specific contributions that Indigenous cultures can make to natural resource management. For example, the *Lower Athabasca Regional Plan*, which is the regional land use plan to guide resource development decisions, states that "[Indigenous] culture, with its connection to the land and environment, provides a unique opportunity for engagement in land planning" (Government of Alberta, 2012, p. 34). Differentiating Indigenous cultures from the mainstream settler colonial culture represented by state governments demonstrates affirmation of human diversity.

Human diversity within the Lower Athabasca River region is also acknowledged through the recognition of multiple knowledge systems amongst participants in regional freshwater governance. Regional committees (e.g., Cumulative Environmental Management Association Traditional Ecological Knowledge Standing Committee) and guidelines (e.g., Traditional Environmental Knowledge Research Guidelines) have been established to guide how Traditional Knowledge is gathered and used within regional freshwater governance arenas, including surface water quantity policy development for the Lower Athabasca River. The

Traditional Environmental Knowledge Research Guidelines, first produced in 2006, were revised in 2012 and then again in 2015, reflecting the "sea change in understandings of traditional knowledge research processes that has taken place over the past decade" (Simmons et al., 2012, p. iii). The learning represented by the iterative revision of the Traditional Knowledge guidelines supported through regional policies and committees are some examples of the continued reaffirmation of human diversity within the Lower Athabasca River region, signaling that crystallization of the first ESF dimension has begun.

Despite clear demonstration of the acknowledgment of human diversity, the first ESF dimension is not fully crystallized in practice within the Lower Athabasca River region. Traditional Knowledge integrity has been compromised in past state government-Indigenous collaboratives, becoming disassembled as it is funneled into governance arenas dominated by Western Science (Castleden et al., 2017; Curran, 2019; McGregor, 2014; Nadasdy, 2003). Nadasdy (2003) describes the disassembling of Traditional Knowledge as a "distillation [of a source of data] according to external criteria of relevance" (p. 183), a process that alters the meaning of Traditional Knowledge and reinforces power structures supporting the dominance of Western Science (Abu, 2017; Nadasdy, 2003). Within the Lower Athabasca River region, Traditional Knowledge gathered by CEMA to understand the cumulative effects of oil sands development was fractured and taken out of its experiential context, rendering it meaningless to the Traditional Knowledge holders (Tanner, 2008). Additionally, Baker and Westman (2018) observed that within the Lower Athabasca River region, Indigenous ontologies that centered around reciprocal relationships between people and non-human entities were dismissed as cultural constructions in favour of settler colonial perspectives on the socio-economic benefits of oil sands developments. Thus, affirming human diversity in practice in the Lower Athabasca River region has been challenging, indicating that crystallization of the first ESF dimension remains in progress.

2.1.4.2 Second Dimension of the Ethical Space Framework

The second ESF dimension is the deliberate agreement amongst peoples with differing worldviews to engage with each other. Treaty No. 8 between the Crown[17] and Indigenous peoples, including MCFN and ACFN, is an early and overarching example of agreement by state governments and Indigenous peoples within the Lower Athabasca River region to engage with each other. Treaty No. 8 sets out the rights and responsibilities of its signatories, which the common law has confirmed includes procedural rights such as the need for state governments to consult with treaty nations when they are considering actions that may affect treaty rights (e.g., consultation) (see Mikisew Cree First Nation v. Canada (Minister of Canadian Heritage), [2005] 3 S.C.R. 388, [2006] 1 C.N.R.L 78; Isaac & Annis, 2010). The procedural and substantive treaty rights established through Treaty No. 8 are recognized and affirmed in s. 35 of *The Constitution Act, 1982*, signaling Canada's intention to establish constitutionally protected rights and the need for engagement between state governments and Indigenous peoples. At the operational level, the GoA, federal government, MCFN, ACFN, and other Indigenous peoples from the Lower Athabasca River region agreed to engage with each other about surface water quantity management by volunteering to become CEMA members. Together, the operational and constitutive levels of agreement between the levels of government and MCFN and ACFN indicate that the second ESF dimension has begun to crystalize within the Lower Athabasca River.

Although state government representatives and Indigenous peoples have formally agreed to engage with each other at the constitutive and operational levels within the Lower Athabasca River region, their engagement can be contentious, undermining the advancement of the second ESF dimension. For example, contention arose between First Nations and state governments when all CEMA members were positioned as a group of "equal" stakeholders providing recommendations to inform policy development:

> From the viewpoint of the First Nations, the Association [CEMA] provided
> recommendations to the Provincial Government from a group of stakeholders, rather than

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[17] The Crown is the reigning monarch in which power to govern is vested. In Canada's constitutional monarchy, the power to govern is entrusted to government to exercise on behalf and in the interest of the people. (https://www.canada.ca/en/canadian-heritage/services/crown-canada/about.html)

rights holders. This design provided a vehicle for Government and companies to involve First Nations in a process that did not adequately consult, but where their participation could be considered as consultation. This left the First Nations powerless to initiate change and protect their Aboriginal rights (Tanner, 2008, p. 93).

The challenges with positioning Indigenous peoples as one of many interest groups or stakeholders within freshwater governance is well-documented and arise because assigning stakeholder status to Indigenous peoples fails to recognize their inherent and treaty rights (Curran, 2019; Phare, 2009; von der Porten & de Loë, 2014). Some Indigenous peoples, academics, and practitioners assert that Indigenous peoples' possession of Aboriginal and treaty rights that flow from their original occupation of territories establishes a nation-to-nation status, positioning Indigenous peoples as rights-holders instead of stakeholders within freshwater governance (McGregor, 2011; Reo et al., 2017). However, Indigenous peoples' more-than-stakeholder status was not universally supported amongst all participants in freshwater governance for the Lower Athabasca River (Tanner, 2008). As claimed by Bullock et al. (2020), negotiation of participant positions is an outcome of and catalyst for enduring relationships necessary for cross-cultural governance of shared resources such as freshwater. Until state governments and Indigenous peoples within the Lower Athabasca River region reach negotiated agreement on Indigenous peoples' status within freshwater governance, crystallization of the second ESF dimension will remain incomplete.

2.1.4.3 Third Dimension of the Ethical Space Framework

The third ESF dimension consists of self-explorations of their perspectives, worldviews, assumptions, attitudes, norms, and practices by the peoples engaged within an ethical space (Ermine, 2007). The purpose of the self-explorations is two-fold: through self-exploration, people can come to know and appreciate what makes them distinct and how their perspectives, assumptions, biases, norms, attitudes, and practices affect other peoples (Ermine, 2007).

While the third dimension applies to all peoples, Ermine (2007) emphasized the need for settler peoples to deeply explore their standpoints on Indigenous peoples. Indigenous peoples, through their subjugation by settler peoples, are generally more aware of the differences between Indigenous and state government worldviews than state governments in Canada (Ermine, 2007;

Royal Commission on Aboriginal Peoples, 1996). State governments in Canada have started exploring their perspectives, assumptions, biases, norms, and practices and how they affect Indigenous peoples through national inquiries that have implications at the local, provincial, and national levels. For example, the 19th century inquiries into Indigenous affairs (Leslie, 1985), the Royal Commission on Aboriginal Peoples in the 20th century, and the Truth and Reconciliation Commission in the 21st century explored how state governments relate to Indigenous peoples, the problems Indigenous peoples experience, and how state policies have created those problems (e.g., policy causes of the health disparities between Indigenous and non-Indigenous peoples in Canada) (McNally & Martin, 2017). Non-Indigenous Canadians are also increasingly paying attention to news and stories about Indigenous peoples and expressing interest in learning more about Indigenous cultures (Environics Institute for Survey Research, 2016). However, greater knowledge of Indigenous peoples and the policy issues they face does not necessarily equate to sympathy towards Indigenous peoples. The Environics Institute (2016) found that higher levels of contact with Indigenous peoples and awareness of Indigenous policy problems resulted in positive views of Indigenous peoples in northern and eastern Canada and in British Columbia but not in the prairie provinces. Evidently, individuals and state governments within Canada are exploring their understandings of Indigenous peoples but public opinion varies on how public policies are impacting Indigenous peoples, suggesting that crystallization of the third ESF dimension is occurring along different trajectories across the country.

At the regional level, one example of state governments' exploration of its practices, norms, and assumptions that is particularly relevant to this research is the set of audits commissioned by the GoA in response to criticisms of CEMA's governance structure and operational processes (CEMA, 2014). The two audits were designed to be complementary, with one of the audits commissioned jointly with the regional Indigenous council to specifically assess the implications of CEMA's operation and structure on its Indigenous members (CEMA, 2014). The GoA demonstrated through the audit process designed specifically with Indigenous peoples in mind that they were willing to undertake self-explorations to better understand how state policy processes affected Indigenous peoples, but the GoA's learning is incomplete. For example, Westman and Joly (2019) found that state governments with jurisdiction in the Lower Athabasca River region are unaware of how Indigenous cultural integrity is harmed by the

abandonment of a subsistence lifestyle for participation in the oil sands wage economy, a transition that is often framed within environmental impact assessments as a benefit to Indigenous communities. Further, state governments often do not understand that the act of extracting oil sands, associated pollution, and landscape changes irreparably destroys the spirit of the land (Buffalo et al., 2011; Joly, 2017). Together, these examples of gaps in state governments' awareness of how Indigenous peoples experience oil sands development indicate that state governments need to engage in additional self-explorations to advance their learning. Until there is a sustained and complete understanding of how Canadian society, including its citizenry and state governments, relate to Indigenous peoples and effects of state policy on Indigenous peoples, the third ESF dimension will continue to be only partially crystallized.

2.1.4.4 Fourth Dimension of the Ethical Space Framework

The fourth ESF dimension consists of peoples cooperatively interrogating each other's perspectives, worldviews, assumptions, norms, and attitudes, leading them to identify commonalities between them (Ermine, 2007). The commonalities provide an entry point for empathetic and egalitarian dialogue that fosters new ideas about mutually important matters for the benefit of all peoples (Ermine, 2007, 2011). Advancement of the fourth ESF dimension within the Lower Athabasca River region is impaired by the partial crystallization of the first, second, and third ESF dimensions as described above, but cross-cultural interrogation is bringing about some change for the benefit of all peoples. For example, some governments are increasingly recognizing the contributions of Traditional Knowledge to the sustainable resolution of complex freshwater problems (see von der Porten et al., 2016; Curran, 2019; Yates et al., 2017), signaling that some governments are interrogating and learning from Indigenous worldviews. Continuing the beneficial change sought through the fourth ESF dimension is dependent in part on overcoming the conflict between federal and provincial governments and Indigenous peoples arising from uncertain Aboriginal and treaty rights to freshwater.

Canada's courts have not yet commented directly on Aboriginal and treaty rights to water (Gullason, 2018; Laidlaw & Passelac-Ross, 2010). This legal uncertainty has frustrated collaborative efforts between both federal and provincial governments and Indigenous peoples in the Lower Athabasca River region. To many Indigenous peoples, their water rights are inherent,

flowing from their Indigenous legal orders. However, Indigenous peoples' ability to gain legal recognition of their inherent water rights alongside constitutionally protected Aboriginal and treaty rights remains difficult. The difficulties arise because inherent Indigenous water rights, which to some Indigenous peoples do not require validation by governments or Canadian courts, are often subordinated to existing settler-colonial laws (Curran, 2019; Phare 2009). Subordination of inherent rights channels Indigenous peoples' rights assertions into administrative processes grounded in common law definitions of Aboriginal and treaty rights (Curran, 2019). Definitions of Aboriginal and treaty rights to water and constitutional protections of water uses necessary to exercise treaty rights are issues that continue to be debated (Gullason, 2018; Laidlaw & Passelac-Ross, 2010).

In the absence of common law affirmation of Indigenous water rights, federal and provincial governments continue to assert ownership over freshwater in their respective jurisdictions, relegating Indigenous rights-based interests in water to just one of the many sets of interests competing within freshwater governance arenas (Laidlaw & Passelac-Ross, 2010). As mentioned above, positioning Indigenous peoples as just one of many stakeholders is considered dismissive by some Indigenous peoples, which can strengthen their resistance to collaborating with state governments. Hence, a positive feedback loop can emerge from contested water rights within freshwater governance arenas that reinforces existing power structures in favour of state governments. When this occurs, collaborations between state governments and Indigenous peoples can be considered colonizing processes (Reo et al., 2017; von der Porten & de Loë, 2013) that do not support the egalitarian and innovative dialogue characteristic of the fourth ESF dimension.

2.1.4.5 Acting on the outcome of the application of the Ethical Space Framework to the Lower Athabasca River Region

The four ESF dimensions within the Lower Athabasca River region were shown to be partially crystallized, signaling that regional freshwater governance is not yet an ethical space. So, how can regional freshwater governance become an ethical space? The answer could lie within the advancements in the four ESF dimensions that signal intensifying legal and political empowerment of Indigenous peoples in having their relationships to and rights around freshwater

recognized through increased influence in freshwater governance (Gutman, 2018; Hemming et al., 2019; Isaac & Annis, 2010; Jackson, 2017). Some state governments are adapting to Indigenous empowerment by seeking means to meaningfully and beneficially involve Indigenous peoples in the regulation and development of freshwater resources (Curran, 2019; Jackson & Nias, 2019). Cultural flows represent an opportunity to overcome the marginalization of Indigenous peoples and their interests in freshwater governance arenas, potentially enabling the continued crystallization of the four ESF dimensions. The next section defines and describes cultural flows.

2.2   Cultural Flows: Changing the Status of Indigenous Interests in River Governance

2.2.1 Genesis of Cultural Flows

Cultural flows as a defined concept emerged in the early 2000s in Australia as some Indigenous peoples' strategic response to the misunderstanding and neglect of their interests in environmental flow assessments (Weir, 2009). Environmental flow assessments are processes that establish the freshwater flow regime needed to achieve socially determined objectives for all types of freshwater aquatic ecosystems (Horne et al., 2017; Pahl-Wostl et al., 2013). This thesis focuses on river ecosystems. Environmental flow objectives for rivers are negotiated through tradeoff evaluations of often competing freshwater uses (Anderson et al., 2019; Horne et al., 2017; Pahl-Wostl et al., 2013). Early environmental flow assessments foregrounded eco-hydrological parameters to achieve select ecological outcomes (Poff & Matthews, 2013) and were sometimes considered to be "acceptable surrogate[s] for the protection of Indigenous interests" (Finn & Jackson, 2011, p. 1232). Although the early approach to environmental flow assessments contributed to the restoration and maintenance of some ecosystem services[18] on which Indigenous societies depend, the assessments often neglected the species, places, human-

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[18] Ecosystem services in this thesis are understood to be the goods provided by ecosystems and the processes within and functions of ecosystems that that support human well-being, linking ecology, societies, and economics (Everard, 2017).

water relationships, religious or spiritual needs, and socioeconomic needs that are culturally relevant to Indigenous peoples (Finn & Jackson, 2011; Weir, 2009). The marginalization of Indigenous peoples' interests through narrow environmental flows assessments is unsurprising given that Indigenous peoples were rarely included in early environmental flow assessments (Jackson et al., 2011; Poff & Matthews, 2013). When Indigenous peoples were included in environmental flow assessments, some governments sometimes had difficulties understanding Indigenous interests and how they related to specific river flow regimes (Jackson et al., 2011). Consequently, some governments were often unable to quantify Indigenous interests in terms of freshwater volumes or river flows, a prerequisite to water planning (Jackson et al., 2011), representing an institutional barrier to cultural flows adoption. Responding to the marginalization of their interests, some Indigenous peoples began developing strategies to shape their participation in state-controlled environmental flow assessments and translate their interests in quantified, hydrologic terms that could be understood by government representatives (Jackson, 2017; National Water Commission, 2009). Cultural flows are one example of a translative policy tool promoted by Indigenous peoples as part of their strategies to increase their institutional capacity to influence freshwater governance in self-determined[19] ways (MLDRIN, 2007).

2.2.2 Meaning of Cultural Flows

Cultural flows remain a translative policy tool, but as the concept diffuses into different jurisdictions, it takes on specific meanings that reflect local circumstances. Since the adoption of quantified cultural flows by state governments may be affected by local circumstances, explaining how cultural flows is defined in this thesis is needed.

First, cultural flows have been used to capture and convey the freshwater interests of diverse social groups (e.g., people sharing religious practices), including Indigenous and non-

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[19] Self-determination in this thesis refers to Indigenous peoples' ability to freely determine their political condition and pursue their form of economic, social, and cultural development as described in Article 3 of the *United Nations Declaration on the Rights of Indigenous Peoples* (https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf).

Indigenous peoples. In this thesis, cultural flows capture and convey Indigenous peoples' freshwater interests.

Second, the meaning of cultural flows reflects the local regulatory regime (Bischoff-Mattson et al., 2018). In jurisdictions with property rights in freshwater, cultural flows may represent a quantum of freshwater owned by a social group that may or may not be traded in water markets (Bischoff-Mattson et al., 2018; MLDRIN, 2007). In other cases, cultural flows are not quanta of freshwater owned by a social group, but rather quanta of freshwater that a social group has the right to use through an authoritative system of water allocation (Bischoff-Mattson et al., 2018). Cultural flows may also refer to any freshwater not owned or allocated to a social group but instead managed through a state regulatory system to achieve a social group's interests (Bischoff-Mattson et al., 2018; Lokgariwar et al., 2014). In this thesis, cultural flows are defined as river flows managed by the GoA to achieve the interests of two Indigenous peoples, including MCFN and ACFN.

Third, cultural flows are also defined in relation to environmental flows. Cultural flows and environmental flows may be considered separate quanta of freshwater allocated to achieve overlapping or distinct sets of cultural (e.g., intergenerational sharing of Traditional Knowledge) and eco-hydrological (e.g., protection of riparian flora) interests, respectively (Jackson & Langton, 2011). Cultural flows can also inform the setting of environmental flows (Magdaleno, 2018; Tipa & Nelson, 2012) because over time the scope of environmental flow assessments has broadened to include a range of interests[20] that "support human cultures, economies, sustainable livelihoods, and well-being" in addition to eco-hydrological objectives (Arthington et al., 2018, p. 4).[21] In this thesis, cultural flows represent the flows necessary to meet Indigenous peoples'

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[20] Interests identified in cultural flow assessments that are used to inform environmental flow assessments may be broad, potentially encompassing aesthetic (e.g., preservation of the geomorphological planform of a river); recreational (e.g., sustained access to swimming holes); ecological (e.g., preservation of a culturally relevant species); social (e.g., sustained access to important meeting places); cultural (e.g., preservation of ritual bathing sites); relational (e.g., human-waterscape connectivity); spiritual and religious; economic (e.g., sustained subsistence livelihoods or commercial enterprises); and political (e.g., clearly defined authorities to govern traditional territories) preferences (Finn & Jackson, 2011; Lokgariwar et al., 2014; Tipa & Associates, 2018).

[21] Environmental flows were initially understood by researchers and practitioners to represent the minimum instream flows necessary to support healthy aquatic ecosystems, but there was no universal definition. This began to change in 2007 when an international vision and direction for environmental flows was set in *The Brisbane Declaration and*

interests that were factored into the environmental flow assessment for the Lower Athabasca River.

Fourth, cultural flow needs, along with environmental flow needs, can be assessed for regulated (dammed) or unregulated (free-flowing) rivers (see Mackenzie et al., 2017b for cultural flows; see Poff & Matthews, 2013 for environmental flows). The cultural flows example examined in this thesis is for an unregulated river, the Lower Athabasca River.

Fifth, cultural flows represent negotiated collective interests in freshwater. Societies and the people constituting a society are diverse, meaning that neither societal nor individual level interests in freshwater should be assumed to be homogenous (Alberta Health Services, 2020; Voyageur & Calliou, 2001). To accommodate potential human diversity at different levels, the individuals of a social group or separate social groups need to negotiate amongst themselves to reach agreement on their common interests and the corresponding amounts of freshwater necessary to meet those interests (Bischoff-Mattson & Lynch, 2017). Cultural flows, then, are the agreed-upon freshwater amounts necessary to meet the common interests of individuals within a social group or amongst social groups (Mackenzie et al., 2017a; MLDRIN, 2007). In this thesis, cultural flows express the river flows needed to meet the common interests of two culturally-distinct Indigenous peoples, MCFN and ACFN.

Sixth, cultural flows are river flows needed to meet Indigenous peoples' self-determined, place-specific, and diverse interests. Indigenous peoples' Traditional Knowledge of a river and its social and natural environs informs cultural flow assessments (Jackson et al., 2014; Tipa &

Global Action Agenda (*The Brisbane Declaration*) (Poff & Matthews, 2013). Arthington et al., (2018) described *The Brisbane Declaration* as the "first consensus document that brought together the diverse experiences across regions and disciplines" (p. 1) to define environmental flows as "the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems" (p. 2). In 2018, following the tenth anniversary of *The Brisbane Declaration*, the internationally endorsed definition of environmental flows was updated to reflect the range of extant freshwater aquatic ecosystems and to further emphasize diversity of human relationships with, dependencies on, and responsibilities towards freshwater aquatic ecosystems (Arthington et al., 2018):

> Environmental flows describe the quantity, timing, and quality of freshwater flows and levels necessary to sustain aquatic ecosystems which, in turn, support human cultures, economies, sustainable livelihoods, and well-being (p. 11).

References in this thesis to later or broadened approaches to environmental flow assessments are based in the 2007 and 2018 *Brisbane Declaration* definitions of environmental flows.

Associates, 2018; von der Porten et al., 2016). Traditional Knowledge that is engaged within cultural flow assessments should be broadly regarded as including eco-hydrological knowledge intimately related to spirituality; social behaviors, and skills (Tipa & Associates, 2018); natural resource use and management; worldviews and social relations (First Nations Information Governance Centre [FNIGC], 2012; Houde, 2007); identity (FNIGC, 2012; Houde, 2007; Wier, 2009); and notions of well-being (Tipa & Associates, 2018). Understanding knowledge as consisting of multiple interrelated facets (Jackson et al., 2015) means that the eco-hydrological knowledge used within cultural flow assessments should not be extracted from the broader knowledge in which it was provided (Bohensky & Maru, 2011; Houde, 2007; Nadasdy, 2003; von der Porten et al., 2016). Additionally, Traditional Knowledge shapes individuals' identities (FNIGC, 2012), and individuals participating in cultural flow assessments choose what and how their knowledge is used (Tipa & Associates, 2018). Consequently, Indigenous participants in cultural flow assessments select and prioritize their interests based on the knowledge that they choose to share about the places that are important to them (Jackson et al., 2015; Tipa & Associates, 2018). In this thesis, cultural flows are the river flows that MCFN and ACFN, with assistance from external researchers, determined were needed to enable boat access to their home territories within the Lower Athabasca river region.

Seventh, cultural flows may be framed within a rights agenda (MLDRIN, 2007; Weir, 2016). In contexts where Indigenous peoples are asserting rights stemming from their original occupation of waterscapes that were subsequently colonized by settler societies, cultural flows have been referred to as quanta of freshwater that Indigenous peoples have a right to own (MLDRIN, 2007) or the freshwater flows needed to protect and sustain the exercise of rights (Jackson, 2017). In this thesis, cultural flows are the river flows that MCFN and ACFN assert are needed to sustain their access to their territories so that they may exercise their treaty rights to hunt and fish in ways that are meaningful to them.

In sum, cultural flows in this thesis, termed ANF, describe MCFN's and ACFN's collective and self-determined river flow needs framed as protections of their treaty rights within the unregulated Lower Athabasca River basin. ANF informed the environmental flow assessment for the Lower Athabasca River that in turn was the basis for GoA's regulation of the

surface mineable oil sands industry's consumptive freshwater use from the Lower Athabasca River.

2.2.3 Benefits of Cultural Flows

Participation in cultural flow assessments and state government recognition and delivery of cultural flows can provide diverse and context-specific benefits for Indigenous peoples (Mackenzie et al., 2017a; MLDRIN, 2007). Providing a comprehensive list of all benefits is not feasible as benefits are tied to the specific interests of Indigenous peoples expressed through cultural flows (Mackenzie et al., 2017a). Examples of tangible benefits from cultural flow delivery by state governments include edible plant growth that supports subsistence livelihoods, maintenance of swimming holes, and creation of tourism business opportunities (Mackenzie et al., 2017a). Other benefits of cultural flows are intangible or less concrete but are still critical to Indigenous peoples and relate to the condition of their cultures, identities, and people (Jackson et al., 2015; Mackenzie et al., 2017a).

When Indigenous peoples participate in cultural flow assessments, opportunities for the "re-surfacing of cultural knowledge" will emerge (Mackenzie et al., 2017b, p. 45). As Indigenous peoples gather on their territories to participate in cultural flow assessments, they exchange knowledge about their places, histories, and their communities, often in their own languages, and perform customary activities such as ceremonies or eating country foods (Mackenzie et al., 2017a; Tipa & Associates, 2018). By collectively and actively experiencing facets of their cultural identities, Indigenous peoples may feel confident in and empowered to rejuvenate their cultural knowledge (Mackenzie et al., 2017b; Tipa & Associates, 2018).

Indigenous peoples' capacity for leadership in freshwater governance may be enhanced through the assessment and delivery of cultural flows (Mackenzie et al., 2017a, 2017b). Cultural flow assessments can legitimize Indigenous peoples' interests to both Indigenous peoples and state governments by demonstrating respectful ways of gathering and using Traditional Knowledge to produce a rigorous quantitative translation of Indigenous peoples' interests (Mackenzie et al., 2017a; Tipa & Associates, 2018). Legitimized interests combined with Indigenous peoples' increased visibility through cultural flow assessments may in turn increase state governments' recognition of Indigenous peoples as valued and authoritative collaborators in

freshwater governance (Mackenzie et al., 2017b). As Indigenous peoples move into authoritative positions within freshwater governance, their role as stewards of their waterscapes is reinvigorated, contributing to restitutive justice that helps address "legacies of dispossession and exclusion" in colonial settings (Bischoff-Mattson et al., 2018, p. 242; Mackenzie et al., 2017b).

Another vital outcome of cultural flows is the wellness of Indigenous peoples ("Indigenous wellness") (MLDRIN, 2007). Human wellness is a social construct with meanings that can vary across time and between different social contexts (McMurray & Clendon, 2015; Völker & Kistemann, 2011). In Indigenous societies, Indigenous wellness is sometimes perceived as a function of the integrity of reciprocal and constitutive people-place interdependence through which Indigenous peoples' identities, languages, knowledge systems, spirituality, and cultures may be sustained (FNIGC, 2012). Understanding the relationships between Indigenous wellness, people-place relationships, identity, languages, knowledge systems, spirituality, and cultures needs to account for the historical and political realities experienced by Indigenous people (FNIGC, 2012; Wood et al., 2018). The cultural flows literature recognizes the existence of linkages between river flows and Indigenous wellness, rights, people-place relationships, identifies, languages, knowledge systems, spirituality, and cultures (MLDRIN, 2007), but these linkages require further specification (Anderson et al., 2019).

2.2.4 Critiques of Cultural Flows

There are two main critiques of cultural flows that apply to their use within environmental flow assessments for unregulated rivers. The first critique is context-specific, asserting that cultural flows is an ambiguous term when used to refer to volumetric water rights because flows are not equivalent to volumes of freshwater (Bischoff-Mattson et al., 2018; Jackson & Langton, 2011). Flows are river discharges expressed as a volume of freshwater flowing past a specific geographic point for a specified time. In this thesis, the term cultural flow is used because river discharges rather than freshwater volumes are the basis for establishing the consumptive freshwater use rules constituting surface water quantity policy for the Lower Athabasca River.

Second, cultural flows employ cultural differentiation as the basis for securing freshwater to satisfy peoples' interests which can paradoxically limit the extent to which those interests are

met in environmental flow assessments (Weir, 2016; Jackson, 2017; Jackson & Langton, 2011). This argument rests on three grounds—foregrounding cultural lenses renders invisible the politically dominant social group's biases; tying cultural flows to definitions of traditional indigeneity, which overly constrain Indigenous interests; and limiting the amount of the flows based on the perception that traditional uses require minimal flows (Weir, 2016; Jackson, 2017; Jackson & Langton, 2011). Indigeneity is a construct with context-dependent meanings at the personal and collective levels within societies, but it generally refers to membership in a self-identified community with longstanding, original ties to a bounded territory that perceives itself as culturally distinct from peoples who assert power over them (Sarivaara et al., 2013; van der Muur, 2018). When they are framed using the general elements of territorial ties, cultural distinction, and power differentials, cultural flows become an expression of indigeneity in freshwater access and use struggles (Weir, 2016).

Although intended to empower Indigenous peoples, invoking indigeneity to advance Indigenous interests through cultural flows can instead lead to the prioritization of the politically dominant social group's interests in environmental flow assessments (Jackson, 2017; Jackson & Langton, 2011). Selecting and prioritizing interests in freshwater is a social process in which social groups apply their own cultural lenses to understand freshwater systems and uses (Jackson, 2017). Jackson and Langton (2011) contend that within Australia's colonial settings, the politically dominant social groups within freshwater governance arenas are often unaware of how their cultural lenses shape their characterization of their own and Indigenous peoples' freshwater interests. Perceiving their own interests as acultural and Indigenous peoples' interests as merely cultural, the politically dominant social group often finds their own interests to be more creditable (Jackson & Langton, 2011). Weir (2016) makes a related argument, asserting that a social group's cultural lens is in part expressed through their knowledge system, and the knowledge system of the politically dominant social group tends to prevail in environmental flow assessments. When Western Science is the prevailing knowledge system, the interests that stem from that knowledge system are often perceived as objective and universal, and therefore, unbiased and apolitical (Weir, 2016). Conversely, interests stemming from Traditional Knowledge systems are often perceived as spiritual and local, and therefore, values laden and culturally specific. Jackson (2017) and Weir (2016) warn that interests perceived by the

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politically dominant social group as unbiased and apolitical are prioritized over interests perceived as values-laden and culturally-specific, marginalizing Indigenous peoples' interests in environmental flow assessments. In short, cultural differentiation can prompt dichotomous stereotyping of interests stemming from Traditional Knowledge and Western Science because the politically dominant social group's cultural biases remain hidden, reinforcing their preference for their own interests.

Invoking indigeneity may also unintentionally marginalize interests that Indigenous peoples express through cultural flows by "require[ing] the production of a 'traditional' culture" (Weir, 2016, p. 146; Jackson, 2017). Politically dominant social groups within colonial contexts sometimes assert essentialist notions of indigeneity as consisting of a core set of unchanging and uniform traits that have persisted since before the time of contact with settler peoples (Jackson, 2017; van der Muur, 2018). Indigenous peoples that meet the politically dominant social group's criteria for indigeneity are more likely to be rewarded by favourable decision-making that meets their interests. Indigeneity, then, becomes something that needs to be performed or provided according to meanings delimited externally by politically dominant social groups (McCormack, 2011). "Modern" Indigenous freshwater uses (e.g., economic development) or contemporary expressions of traditional practices (e.g., forms of dress that incorporate new materials; formats of education) that do not fit the externally delimited meanings of indigeneity are often excluded from governance arenas (McCreary & Milligan, 2014). Cultural flows then are perceived by some politically dominant social groups as appropriately expressing "traditional" interests only (Jackson, 2017; Weir, 2016) because being Indigenous means being "unchanging with a fossilized past" (Fan et al., 2020, p. 3).

Jackson and Langton (2011) contend that employing cultural flows can relegate Indigenous peoples' interests "to a reified and token category of use that counter-intuitively tends to require negligible amounts of water" (p. 123). For many Indigenous peoples, their cultural identity and socio-economic status depends on the health of aquatic ecosystems (Anderson, 2010; Cave & McKay, 2016; Weir, 2009). If the objectives included in environmental flow assessments included the maintenance of human-waterscape connectivity central to many Indigenous worldviews, the restoration and preservation of aquatic ecosystems would need to take priority over economic freshwater uses (Jackson & Langton, 2011). Cultural flows, then, would need to

be closer to natural flow regimes if Indigenous interests are to be met. However, Jackson and Langton (2011) argue that "[t]he concept of [cultural flows] has gained attention in policy circles because it appears to accord with a preconception that [I]ndigenous groups have no significant demand for water resources" (p. 117). Such a preconception is driven in part by the perception that cultural flows are limited to "traditional" freshwater uses such as the ability to access drinking water while hunting or for ceremonial uses that can be satisfied with small freshwater quantities (Jackson & Langton, 2011; Weir, 2009). Perceiving Indigenous peoples' freshwater demands narrowly limits the need to redistribute freshwater away from economic interests to accommodate cultural flows, thereby helping to allay political controversy in contexts where competition for freshwater resources is great (Jackson & Langton, 2011). Hence, cultural flows can serve status quo interests rather than catalyzing the redistribution of freshwater amounts to meet Indigenous peoples' full spectrum of modern and traditional interests.

Collectively, the critiques demonstrate that cultural differentiation through cultural flows can be a strategy that unintendedly entrenches the problems of marginalization and delegitimization that cultural flows were to help overcome. However, cultural differentiation has also conferred more visibility to Indigenous peoples, allowing them to resist assimilative policies of politically dominant social groups and be empowered to achieve their political goals in local natural resource struggles (see Primeau, 2010). The positive outcomes of cultural differentiation are evident in the benefits of cultural flows described in section 2.2.3 which encompass greater Indigenous visibility, cultural resurgence, and empowerment. Thus, despite the critiques, increasing our knowledge of the significance of cultural flows to Indigenous peoples and how cultural flows may be advanced within cross-cultural freshwater governance arenas remains helpful.

Specific research into ANF as a cultural flows example is also warranted despite the critiques for contextual reasons. ANF is a cultural flows example that was used to inform an environmental flow assessment, but the critiques by Jackson and Langton (2011) and Weir (2016) were for cultural flows defined as separate freshwater quanta from environmental flows. Given the call for greater incorporation of diverse social and cultural relationships with rivers in environmental flow assessments (Anderson et al., 2019) of which Jackson (2017) and Weir (2016) support, understanding the potential barriers and drivers to the adoption of cultural flows

that inform environmental flows is important. Awareness that Indigenous peoples' interests can differ from interests typically captured in environmental flow assessments is increasing (Finn & Jackson, 2011), suggesting that cultural differentiation is contributing to the expansion of environmental flow assessments to include a broader array of social, cultural, and economic interests. Also, the Indigenous peoples and state government representatives involved in this research were unfamiliar with the term cultural flows at the start of the research, and so were not affected by the confusion and contestation that has emerged around the term in Australia (see Bischoff-Mattson et al., 2018, for a summary of why cultural flows are a contested concept). Finally, and perhaps most importantly, the scholars who warned of the potential problems with promulgating cultural flows as separate freshwater quanta do so with the shared goal of catalyzing institutional change so that Indigenous peoples' freshwater interests are recognized and protected. Hence, further research into how cultural flows can be used to overcome the marginalization of Indigenous peoples' interests in environmental flows assessments and, more broadly, in freshwater governance arenas is warranted.

2.2.5 Advancing Cultural Flows in Alberta, Canada

Alberta is recognized as being one of four Canadian provinces with more advanced environmental flows legal and policy frameworks (Harwood et al., 2014). Yet, Unger (2019) concludes that Alberta's *Water Act*, the primary provincial legislation that supports and promotes the conservation and management of freshwater, "remains inadequate to the task of ensuring sustainable and resilient environmental flows for the province" (p. i). Further, the discretionary water conservation tools available through the *Water Act* to protect environmental flows (e.g., Water Conservation Objectives) are rarely used by the GoA (Bruno, 2014; Unger, 2019). Given that environmental flows appear to be weakly supported by Alberta's legal and policy frameworks and Alberta's historical neglect of Indigenous interests and rights in freshwater governance (Passelac-Ross & Smith, 2010; Unger, 2019), one must ask how can cultural flows like the ANF that inform environmental flow assessments be advanced in ways mutually acceptable to Indigenous peoples and state governments? Since environmental flows and cultural flows are interrelated concepts, insights that answer the question may be gained by examining existing literature on the factors that influence the adoption of environmental flows.

Factors influencing the adoption of environmental flows described in existing literature from across the globe focus primarily on actions that state governments should undertake to create freshwater governance arenas conducive to environmental flow protections. Political will is often the most influential factor on environmental flows adoption (Le Quesne et al., 2010; Moore, 2004; Pahl-Wostl et al., 2013), which is expressed and enabled through legislative and policy frameworks that clearly support and guide the establishment of environmental flows (Arthington et al., 2018; Harwood et al, 2010) and are clear in Indigenous rights and title (Jackson & Langton, 2011; Weir, 2016). Jurisdictional fragmentation in which multiple organizations and levels of government have interrelated responsibilities for freshwater (Le Quesne et al., 2010), legislative protections of existing rights to the use of licensed freshwater amounts, and prior allocations of freshwater for storage or consumptive uses (Harwood et al., 2018; Le Quesne et al., 2010; Unger, 2019) are likely to place constraints on implementation of environmental flows. Together, knowledge availability, including scientific information (Harwood et al, 2018; Moore, 2004) and local and Traditional Knowledges (Arthington et al., 2018) facilitate the assessment of environmental flows needs. Stakeholder acceptance of environmental flows encourages their adoption and may be garnered through participatory environmental flow assessments that consider environmental, social, and economic interests (Harwood et al., 2018; Moore, 2004; Pahl-Wostl et al., 2013) and diverse social relations with rivers (Anderson et al., 2019). Stakeholder participation in environmental flows assessments is dependent on resource availability (e.g., funding) and their technical capacity to obtain, analyze, and apply information to identify objectives and corresponding freshwater needs (Arthington et al., 2018; Harwood et al., 2018; Magdaleno, 2018; Moore, 2004; Pahl-Wostl et al., 2013). Collectively, the preceding institutional factors signal that there is growing awareness of policy needs for the advancement of environmental flows as tools to protect riverine ecosystems. However, Harwood et al. (2014) recommend that the perspectives of non-state participants in environmental flow assessments be gathered to deepen understanding of the adoption of environmental flows. This research takes up Harwood et al.'s (2014) recommendation but applies it to the adoption of cultural flows that inform environmental flow assessments by presenting the perspectives of MCFN, ACFN, and their allies alongside the perspectives of state government federal and provincial on the GoA's adoption of ANF.

2.3 Implementing Innovation Framework: Understanding the Adoption of Cultural Flow

2.3.1 Summary of the Implementing Innovation Framework

Steelman's (2010) Implementing Innovation Framework (IIF) (Table 2.1; Figure 2.1) was applied in this research to understand the factors that influenced the GoA's adoption of ANF with the goal of advancing cultural flows as an innovative water policy tool for overcoming the marginalization of Indigenous interests in environmental flow assessments. Innovations are manifestations of intentions to improve the human condition in some way (Howlett et al., 2009; Steelman, 2010) that, under the IIF, do not have to be entirely original provided they are new to the organization implementing them (Steelman, 2010). Cultural flows, a freshwater policy tool devised by Indigenous peoples, is considered an innovation within the research context because cultural flows as a defined concept was new to the federal and provincial governments. ANF were also considered innovative because ANF were introduced by MCFN and ACFN to improve their condition by sustaining their access to their traditional territories and were new to the provincial and federal governments. Since ANF fall within the definition of innovation underpinning the IIF, the application of the IIF in this thesis is supported.

Table 2.1: Implementing Innovation Framework
(adapted from Steelman, 2010)

Individuals	Structures	Culture
Motivation: The impetus for innovation rests with discontented individuals who are free to devise alternative possible solutions. **Norms and Harmony:** Social norms and a desire to preserve harmony in the workplace shape individual actors' predisposition toward change. **Congruence:** Congruence between dominant values within different levels of government will affect individual support for an innovation.	**Rules and Communication:** Administrative rules, communication, and information exchange support compliance. **Incentives:** Organizations provide incentives and resources to alter the cost-benefit calculus to support innovation. **Opening:** The political structure allows marginalized groups an opportunity to foster change. **Resistance:** Inertia in the existing institution creates resistance to new practices. Efforts may be obstructed by larger power dynamics and vested interests.	**Shocks:** Shocks to the system provide the opportunity for alternative courses of action. **Framing:** Framing processes can condition people's perception that they are aggrieved and that by acting collectively they can improve the situation. **Legitimacy:** New practices enhance the social legitimacy of the organization.
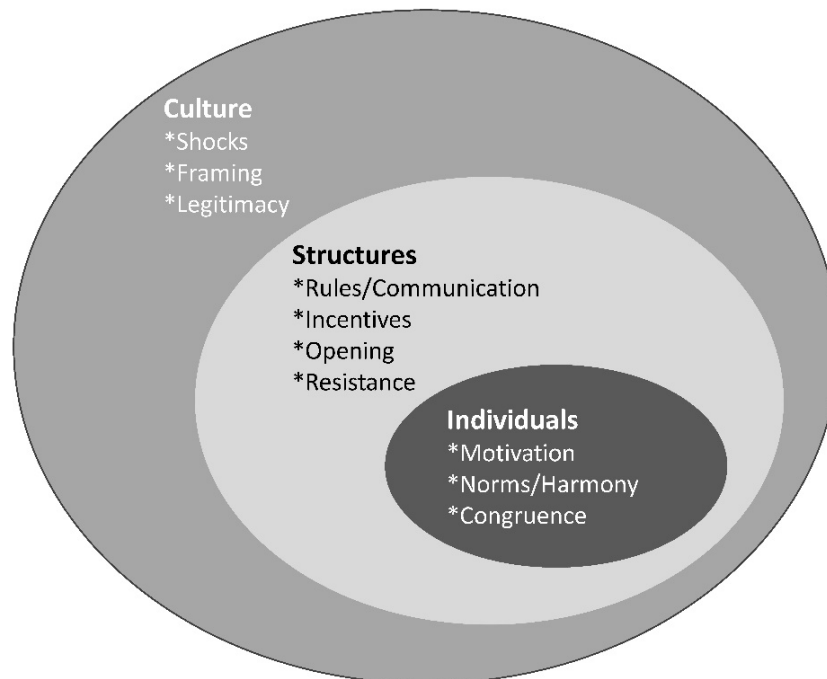
Figure 2.1: Nested levels of the Implementing Innovation Framework
(adapted from Steelman, 2010)

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The IIF is a typology of influences explaining why some innovations endure while others fail (Bergemann, 2017; Cook, 2014; Fiorino, 2014; Steelman, 2010) (Table 2.1; Figure 2.1). Steelman (2010) argues that to understand why innovations endure, innovation durability should be considered a function of people's ability to catalyze change within broader institutional contexts. Institutions are broadly defined by Steelman (2010) as "structures, rules, law, norms, [practices, procedures], and sociocultural processes that shape human actions" (p. 3), which is the definition adopted in this thesis. Institutional contexts are diverse, but Steelman synthesized literatures on public management, policy studies, and implementation theory to reveal ten interacting institutional factors that she organized into nested individual, structural and cultural categories constituting the IIF. The IIF seeks to understand innovation durability by accounting for individual people's predisposition for change, the structures that constrain or facilitate change, and the opportunities and cultural frames necessary for change (Steelman, 2010).

Three factors occur at the individual level of the IIF, encompassing personal situations that affect how people foster or respond to change (Steelman, 2010). *Motivation*, the first individual level factor, reflects the role of the individual in innovation implementation and is the drive that people feel to effect change because of their discontent with the status quo situation (Cook, 2014; Steelman, 2010). Motivated people must possess some level of authority to devise alternative courses of action to solve problems in innovative ways (Cook, 2014; Steelman, 2010). *Norms and harmony*, the second individual level factor, refer to people's desire to preserve good relationships in the workplace, predisposing them to pursue and accept innovations that are consistent with workplace practices and social dynamics (Cook, 2014; Steelman, 2010). *Congruence*, the third individual level factor, refers to how closely people's values, the values of the organizations within which people work, and the values represented by the innovations are meshed (Cook, 2014; Steelman, 2010). At the individual level, innovations are more likely to endure when motivated people act on their discontent by finding solutions that harmonize with workplace social norms and values and organizational values support the innovation (Bergemann, 2017; Fiorino, 2014; Steelman, 2010).

Four factors occur at the structural level of the IIF that give form to and arrange the arenas in which people try to affect change within their organizations. *Rules and communication* constitute the first structural level factor (Cook, 2014; Steelman, 2010). Rules, including laws,

regulations, and formal and informal policies, can provide top-down support for and expectations around innovations (Cook, 2014; Steelman, 2010). Communications is about information exchange, interaction, and relationship building between peoples so that they can understand innovations, expectations about the innovation, and the operationalization of innovations (Cook, 2014; Steelman, 2010). Together, rules and communications provide the administrative supports for people to understand, accept, and implement innovations (Cook, 2014; Steelman, 2010). *Incentives*, the second structural level factor, refer to tangible or intangible resources, advantages, or benefits used by organizations to alter the cost-benefit calculus undertaken by individuals deciding whether to accept an innovation (Cook, 2014; Steelman, 2010). Some examples of incentives include financial benefits, camaraderie, and skill development (Steelman, 2010). O*pening*, the third structural level factor, refers to the accessibility of decision-making processes to marginalized groups and the degree to which organizations and individuals are open to change (Cook, 2014; Steelman, 2010). *Resistance*, the fourth structural level factor, refers to the inertial forces within organizations that seek to maintain status quo situations, including vested interests and whether interest-holders possess and are inclined to use their power to protect those interests (Cook, 2014; Steelman, 2010). At the structural level, innovations are more likely to endure when rules clearly support the innovations, clear lines of communication based on strong relationships foster understanding and acceptance of innovations, marginalized groups have opportunities to foster change within open decision-making arenas, and there is an awareness of inertial forces and mitigations to overcome resistance to innovations within organizations (Fiorino, 2014; Steelman, 2010).

Three factors occur at the cultural level of the IIF, encompassing macro circumstances affecting change (Cook, 2014; Steelman, 2010). *Shocks*, the first cultural level factor, refer to natural or anthropogenic catalytic events that alter people's attitudes and perspectives about status quo situations, creating windows of opportunities for people and organizations to think differently about situations and embrace new courses of action (Cook, 2014; Steelman, 2010). Some examples of catalytic events include natural disasters (e.g., river flood), court decisions, and industrial disasters (e.g., tailings dam burst) (Steelman, 2010). *Framing*, the second cultural level factor, refers to the narrative telling used by individuals, interest groups, media, and elected officials to shape how people understand problems, their impacts, and possible solutions to incite

collective action to change situations in specific ways (Cook, 2014; Steelman, 2010). Framing is often geared towards making people aggrieved in some way so that they desire change (Cook, 2014; Steelman, 2010). *Legitimacy*, the third cultural level factor, refers to organizations' search for enhanced social status through the adoption of innovations that align with organization mission statements and that are considered valid and acceptable to society (Cook, 2014; Steelman, 2010). At the cultural level, innovations endure when they align with new ways of thinking about situations brought about by shocks, are supported by strategic problem framings that resonate with individuals, and enhance the social legitimacy of organizations (Bergemann, 2017; Fiorino, 2014; Steelman, 2010).

Application of the IIF provides insight into innovation durability at the IIF factor (e.g., motivation, resistance, framing) and IIF category (individual, structural, cultural) levels. Not all factors will be equally important to all cases of innovation implementation, but innovations are likelier to take hold when they are supported at the individual, structural, and cultural levels (Steelman, 2010). Stated differently, when "individual, structural, and cultural factors are mutually supportive of the innovation—then the innovation stands the greatest chance of being implemented" (Steelman, 2010, p. 185). Consequently, understanding innovation durability necessitates that the role of each factor in implementation be examined, their relative influence on implementation be gauged, and the patterns in which the factors occurred be identified. Steelman (2010) tested the IIF using three cases studies representing governance systems for land protection (diffused power to a broad set of participants for the protection of scenic places in Colorado), watersheds (networked stakeholders entered into voluntary agreements to resource the mitigation of non-point source pollution within the Cheat River watershed, West Virginia), and forests (cross-cultural collaborative forest stewardship within New Mexico's Carson National Forest). Through these case studies, Steelman (2010) confirmed the applicability of the ten factors to understanding innovation durability and that implementation will be sustained when all three categories of factors are aligned in their support for an innovation.

2.3.2 Applying an Implementation Framework to Innovation Adoption

Steelman (2010) devised the IIF to examine factors that influenced implementation of an innovation rather than its adoption, the latter of which is the topic of this thesis. As mentioned in

Chapter One, adoption is defined in this thesis as the phase of the policy process in which policy problems are recognized, potential solutions are identified and assessed, and a course of action is selected (Howlett et al., 2009; Marier, 2017). Adoption precedes implementation which is putting into practice the selected course of action to achieve the policy's intended outcomes (Ansell, Sørensen & Torfing, 2017; Steelman, 2010). Since they are distinct phases in policy processes, the question of whether an implementation focused framework should be applied to the adoption of an innovation must be asked. Support for the application of the IIF to innovation adoption is provided by Cook's (2014) study in which he applied the IIF to understand the factors that led to the United States Environmental Protection Agency's adoption of engagement practices that directly involve stakeholders in the formulation of language for substantive rules. Cook (2014) concluded that the IIF "model may be of use in analyzing the adoption of innovative practices in other cases" and should be tested in other contexts (p. 179). Accordingly, the IIF was applied in this research to understand the factors that influenced the GoA's adoption of ANF in freshwater policy regulating surface mineable oil sands water withdrawals.

2.3.3 Applying the IIF under the ESF

In this thesis, the IIF is applied under the ESF as its complement in two ways. First, both frameworks are concerned with effecting change in arenas shaped by power dynamics and the influence of marginalized peoples. The ESF is fundamentally concerned with overcoming power differentials between settler and Indigenous peoples so that egalitarian spaces are established to achieve mutually beneficial change. The IIF was not developed specifically with cross-cultural power dynamics in mind, but it does address forces of power and influence in two of the ten factors that affect innovation durability (resistance and opening). The power of vested interest groups to maintain the status quo and their willingness to use that power are accounted for in the resistance factor of the IIF while the opening factor of the IIF is concerned with how open political structures are to the influence of marginalized peoples. Steelman (2010) confirmed the critical role that resistance and opening play in a cross-cultural context using a case study of collaborative stewardship of lands within the Camino Real Ranger District in New Mexico involving the United States Forest Service and Hispano land grant villages. Therefore, the application of the IIF under the ESF draws specific attention to the roles of cross-cultural power

dynamics, vested interests, and marginalized peoples in affecting change through innovation practices. In short, the IIF supports rather than diminishes the fundamental purpose of the ESF to beneficially improve the conditions of all peoples through egalitarian cross-cultural mutual learning and innovation.

Second, the operational nature of the IIF complements the orienting nature of the ESF. The ESF orients people towards self-exploration and respectful interrogation of others' assumptions, biases, perspectives, practices, and norms to reach deep self-awareness and mutual cross-cultural understanding (Ermine, 2007), but it does not provide instruction on how to accomplish that learning. The IIF facilitates the ESF learning process by structuring the self-explorations and reciprocal interrogations around a defined set of factors affecting innovation adoption. Thus, applying the IIF under the ESF in this thesis opens the research to creating rich data about innovation adoption that is sensitized towards developing ethical spaces in which Indigenous peoples and state governments can engage.

2.4 Summary

Ethical space, cultural flows, and innovation adoption are about affecting lasting and beneficial change. The diffusion of cultural flows as an innovative freshwater policy tool to inform environmental flows assessments is an opportunity to effect beneficial change for Indigenous peoples by establishing cross-cultural freshwater governance arenas as ethical spaces. Institutional forces are likely instrumental in influencing the adoption of cultural flows, and they need to be empirically explored to better understand their nature and how they may be aligned to support their incorporation into environmental flow assessments. That is not to imply that state governments should automatically adopt cultural flows. Rather, cultural flows need to be advanced in ways that are mutually acceptable to state governments and Indigenous peoples if they are to be products of ethical space. Indeed, MCFN and ACFN requested that provincial and federal governments collaborate with them on refining ANF. The next chapter describes the research design used in this thesis to gain insight into the alignment of institutional forces so that ANF may be advanced in surface water quantity policy for the Lower Athabasca River in ways mutually acceptable to Canadian state governments and Indigenous peoples. Insights gained through ANF example will contribute to a broader understanding of cultural flows adoption so

that Indigenous peoples and their interests are no longer marginalized in cross-cultural freshwater governance. Respectful engagement of Indigenous peoples and centering their interests is beneficial as ethical use of diverse knowledge systems helps advance sustainable freshwater policy for waterscapes on which all people depend.

CHAPTER 3 – METHODOLOGY

3.0   Introduction

Chapter Three describes the methodology used in this research to explore the significance and adoption of ANF. Principles of egalitarianism and collaboration drove my methodological choices because they align with my personal standpoint and the standpoints of our three Indigenous research partners, including MCFN, ACFN, and the FCM. Melody Lepine, Director of the MCFN's Government and Industry Relations office, [22] reminded me during the research planning phase that "we are all treaty peoples" and that as a Canadian citizen, I too have a personal responsibility to foster equitable and reconciliatory relationships amongst Canada's peoples. Melody's statements reinforced my standpoint that research should aim to improve relationships between Indigenous peoples and Canadian state governments in terms of how research is conducted and the purposes of the research. How the research was conducted was further informed by the Indigenous research partners' expressed interest in supporting collaboration between their citizenries, which led to the FCM being involved even though they were not part of ANF development. The purpose of the research was guided by the Indigenous research partners' shared objective to build egalitarian relationships with governments for the benefit of all living human and non-human things, which is why this research seeks insights into how to advance ANF in freshwater policy in ways mutually acceptable to Indigenous citizens and state governments in Canada. By respecting my standpoints and those of the Indigenous research partners, the methodology was grounded in engaging the Indigenous peoples involved in this research as partners rather than research subjects. The research approach and methods were conducted according to and approved by the Behavioural Research Ethics Board approval Beh 15-134.

Below, the methodological choices are further described and explained. First, the philosophical foundation of this research is explained, including reflections on my own

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[22] Melody Lepine expressly permitted me to use her personal name in this thesis when I quote her statement that "we are all Treaty peoples".

standpoints. Then, the research approach that combines community-based participatory research (CBPR) and constructivist grounded theory (CGT) is justified and elaborated. Last is a description of the different combinations of data collection and analysis methods used to address the two sets of research questions.

3.1   Research Philosophy Reflections

3.1.1 Research Paradigm

There is not one universal research paradigm taxonomy. I chose to use the research paradigm classification presented by Patterson and Williams (1998) because it was prepared for inquiries into natural resources management and subsequently used in a review of different ways that freshwater is conceptualized (Wesselink et al., 2017). Paradigm classifications for freshwater resources related inquiries intersects directly with the research purpose and questions explored here. The Patterson and Williams (1998) classification of research paradigms is based on what they term "normative commitments" to different ontological, epistemological, and axiological standpoints (p. 287). This classification scheme uses statements to indicate different positions along the ontological, epistemological, and axiological spectrums, but the authors clearly state that these statements should be considered tools for reflection rather than absolute delineations between mutually exclusive normative commitments. Using the descriptive statements within the Patterson and Williams classification scheme, I reflected on my own positions along the ontological, epistemological, and axiological spectrums (Table 3.1).

Table 3.1: Characterization of my research paradigm assumptions

Normative Assumption Type	Assumption Definition (Patterson & Williams, 1998, p. 288)	Characterization of my Assumptions (based on wording provided by Patterson & Williams, 1998, p. 288)
Ontological assumptions	Includes the nature of reality, nature of human experience, and human nature	• Humans actively construct identities, reality, and knowledge • Human experience is caused by isolatable environmental and personal variables, although I qualify this by arguing that the variables and meaning attached to those variables may be different amongst different knowledge systems or over time • Individuals are actively engaged in the construction of meaning as opposed to rationally processing information that exists in the environment to achieve specific goals
Epistemological assumptions	Includes the relationship between researcher and phenomenon observed, and the nature of the research process and knowledge generated	• Observation is an interpretive act where knowledge is coproduced • Research expresses understandings and knowledge that is contextual and time bound
Axiological assumptions	Includes terminal goals (ultimate aim of science) and instrumental goals (criteria by which research is evaluated as acceptable or unacceptable)	• Aim of social science is understanding and communication rather than explanation, prediction, or control • Research needs to be insightful, persuasive and used rather than generalizable and valid

My reflections revealed that my assumptions are partly dependent on the research topic and questions, and that I believe there is equal need for objectivist and generalizable science (objectivist-positivistic science) and subjective and contextualized science (constructivist-interpretivist science). Valuing multiple paradigms is common (Patton, 2015) and mirrors my combination of training as a physical geographer grounded in quantitative natural science and my professional experience within the complex environmental co-management system operating within Canada's Northwest Territories (NWT). The NWT co-management system deliberately brings together different forms of knowledges including local, Traditional, and scientific knowledge and different sectors including multiple levels of government (municipal, territorial, federal, and Indigenous), different industries, advocacy groups, and individual members of the public. I directly experienced, from the perspectives of a co-management regulator, industrial developer, and consultant to Indigenous and federal governments, how different people could attach different meanings to the same objects, relationships, processes, and decision outcomes, and that these meanings were deeply felt by individuals. Out of these experiences grew my

belief that understanding policy adoption requires acceptance of people acting on different realities constructed by their own beliefs and experiences. These experiences also fostered my preference for research seeking to effect change that addresses real problems important to people participating in freshwater governance arenas. Consequently, I have embraced a constructivist-interpretivist orientation that understands research to be a subjective endeavor producing contextualized, co-constructed knowledge to understand the significance of and adoption of ANF. Pragmatic activism is key to a constructivist orientation (Guba & Lincoln, 1994; Charmaz, 2014).

3.1.2 Critical Reflections on my Role in the Research

A constructivist research paradigm accepts researchers are part of the research endeavor, necessitating researchers to critically reflect on their role in the research process. Reflecting on roles can make visible biases and assumptions that shape data collection and analysis, allowing those biases and assumptions to be examined and addressed through the research process. My reflections crystallized around two events, including (i) a thought-provoking question directed at me during a student conference; and (ii) a statement made to me about what non-Indigenous researchers (can) know about Indigenous needs. These events and my reflections on them are explained below to provide insight into why I selected the methodology used in this research.

3.1.2.1 Event 1: "Should you be undertaking this research?"

Following a presentation on my research topic during an on-campus student research conference, a provocative question was posed to me: "Should you be undertaking this research?" The audience member asking the question introduced it by discussing the inappropriateness of people outside of a community telling the stories of that community, implying to me that I was perceived as a non-Indigenous person inappropriately conducting research with Indigenous peoples. As I had not included any comments about my ancestry in the presentation, the asker may not have understood that my circumstances make that a complex question for me to answer. My father and paternal grandmother are status citizens of the West Bank First Nation in British Columbia, but I am not. I grew up aware of but only tangentially involved with family members living on reserve lands or closely identifying with their Indigenous ancestry. So, am I part of an

Indigenous community or not? I continue to explore this question for myself, but I certainly am not a citizen of the Indigenous research partners with home territories in the Peace Athabasca Delta, including MCFN, ACFN, and the FCM.

To respect that I am not part of the Indigenous communities of the Peace Athabasca Delta, I sought the perspectives of Elders[23] and river users on whether someone from outside their community should be doing this research. Many individuals questioned whether research in general is helpful because, after being "researched to death", they still see little change on the ground. However, many supported this project because it was perceived as an educational tool for me and other academics associated with the project. As I and my colleagues became more familiar with Indigenous cultures and the challenges that Indigenous peoples face, the hope was that we would effect change for their communities by catalyzing relationship building between Indigenous and non-Indigenous peoples of Canada. In other words, research was an opportunity for reconciliation, and it was on this basis that I committed to this research project.

Research by individuals outside of an Indigenous community can only advance reconciliation if done respectfully. Respectful research is context specific, but in this case, I deliberately chose a power-sharing methodology to explore mutually important issues with the expressed permission of the three Indigenous groups. The power-sharing methodology, termed CBPR, is expanded on in section 3.2.2, but a particularly critical aspect of respectful research with Indigenous peoples is to acknowledge that research findings represent the researcher's interpretations of the information shared by research participants. I acknowledge that the analysis presented here is my narrative, and accordingly have combined CBPR with Constructivist Grounded Theory (CGT) that perceived knowledge as co-constructed by researchers and research participants (see section 3.2.3). CGT, as suggested by its name, also falls within a constructivist research paradigm that emphasizes researcher reflexivity (see section 3.2.3). At their core, my reflections revealed my standpoint to be one that considers

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[23] I use the term 'Elders' in this thesis to refer to individuals that are identified by *their* communities as Elders. While there are differences amongst the Indigenous research partners, I generally understand Elders to be individuals respected for their knowledge and wisdom that may speak about the laws, history, culture, and worldviews of their peoples.

reconciliation within Canada to be vital, context specific, and (partially) enabled through policies that explicitly address Indigenous perspectives and interests.

3.1.2.1   Event 2: "She's just an academic. She doesn't know what we know inside."

While discussing their different perspectives on cultural flows, an Indigenous representative said of a non-Indigenous academic: "She's just an academic. She doesn't know what we know inside." The Indigenous representative and non-Indigenous academic are familiar with each other and their respective efforts to have Indigenous interests addressed in freshwater governance through a long-term working relationship. The conversation around this statement described how non-Indigenous academics' intentions to help advance Indigenous interests in freshwater resources management are appreciated by Indigenous peoples, but that these "good intentions" are insufficient. Non-Indigenous researchers must approach the research endeavor with humility and be open to learning from the Indigenous participants, foundational elements of the CBPR approach selected for this project. Researchers may learn how research based on good intentions may still not be helpful to Indigenous peoples or may not accurately capture Indigenous needs or values despite following rigorous research designs. These inaccuracies, as suggested by the reference to an unknowing academic, are a result of misalignment between the theoretical lens through which research is conducted and the worldviews of the Indigenous research participants.

I selected the ESF as the theoretical lens guiding this research because it emerged from the experiences and reflections of an Indigenous scholar on reconciliation. Using an Indigenous framework within a CBPR approach will hopefully increase my ability "to know" the perspectives of MCFN, ACFN, and the FCM so that my position as an academic is more than a good intention. Additionally, the ESF provides a mechanism for expressing different narratives on the same topic separately, which was compatible with the desires held by the Elders and river users participating in this project. Elders and river users had concerns about the transparent gathering and use of their knowledge because many of them have spent hours sharing their information and stories with researchers only to be given a written document in which they cannot "find their voices". Their voices become hidden because qualitative research requires that shared information be fractured, abstracted, and reassembled to find meaning in a

phenomenon, and the Elders and river users wanted to see their words and knowledge in this thesis. By presenting community and government narratives separately in this thesis, I hope to provide the desired transparency necessary for people to find their voices. Towards the end of my project, one MCFN representative revealed that the ESF had recently become part of their discussions with other Indigenous groups, lending support to my use of that framework in this research.

3.2 Research Strategy

3.2.1 Qualitative Approach

A qualitative research strategy was adopted for this research because Lavallee (2009) observed parallels between qualitative research and Indigenous epistemology including rejecting the notion of objective and unbiased research because researchers and research participants influence each other through their connectedness. While qualitative research can give voice to marginalized people (Wright et al., 2016), not all qualitative approaches are considered culturally appropriate for use with Indigenous peoples and epistemologies (Wright et al., 2016; Wilson, 2008; Drawson et al., 2017). A qualitative approach following the principles of CBPR is recognized by some Indigenous scholars as being one means of identifying culturally appropriate ways in which to engage Indigenous peoples in research (Simonds & Christopher, 2013; Drawson et al, 2017).

3.2.2 Culturally Appropriate Community-Based Participatory Research

CBPR was pursued as the primary approach to this research because it promotes egalitarian and collaborative research, principles important to me and the Indigenous research partners. CBPR emerged as a reaction against the notion of community members as research subjects, promoting partnerships between researchers and "inside experts" (Horowitz et al., 2009, p. 1; Padgett, 2012). Inside experts are community members knowledgeable of and experienced in the issue(s) being studied through living their everyday lives (Horowitz et al., 2009). Viswanathan et al. (2004) define CBPR as follows:

[CBPR] is designed to ensure and establish structures for participation by communities affected by the issue being studied, representatives of organizations, and researchers in all aspects of the research process to improve health and well-being through taking action including social change (p. 3).

This definition underscores the main goals of CBPR, which are to produce research with and relevant to members of a community affected by an issue in equitable ways that can catalyze community desired change (Hacker, 2013; Strand et al., 2003). Seeking social change is an important part of CBPR, and change is usually easier to achieve when those affected by the change are involved (Strand et al., 2003).

Orienting oneself towards egalitarian and collaborative research through CBPR is guided by principles applicable to all phases of the research process. CBPR principles are organized and described differently by different researchers, but a set of core principles was compiled from Drawson et al. (2017), Hacker (2013), Horowitz et al. (2009), and Padgett (2012). These principles are detailed in Appendix A and summarized here. CBPR understands community to be a group of individuals socially linked by perspective, experience, or geography (Hacker, 2013; Padgett, 2012). The community for this research includes the MCFN, ACFN, and the FCM who are linked geographically through their overlapping territories within the Peace-Athabasca Delta region and experientially by living downstream from the surface mineable oil sands region. MCFN and ACFN are also linked through their joint promotion of ANF. CBPR also values the use of different knowledge sources which was demonstrated in this research, for example, by changes in the interview guides to accommodate questions that the Indigenous research partners deemed relevant (e.g., questions inquiring into peoples' feelings about reduced river navigability). Multilateral resource sharing, co-learning and capacity building, also critical in CBPR, were demonstrated in multiple ways such as when MCFN's community-based monitoring program provided me with a tour of the delta and the university hired a community research assistant to help with identifying research participants and culturally appropriate research protocols. Protocols for shared decision-making and collaboration during all research phases were described in signed research agreements between the University of Saskatchewan and the Indigenous research partners. Responsibilities for knowledge transmission were also shared by all research partners. I shared information about the research with the Indigenous research partners through trip reports, reviewed preliminary findings during community meetings, and presented research findings during conferences and through this thesis. The

Indigenous research partners and I are also planning to collaborate on a video about river navigability and the community which will be owned by the Indigenous research partners for uses that they consider appropriate. Relationship building outside of the research activities is another vital part of CBPR and occurred through my participation in community festivals and music events. Finally, CBPR principles include supporting social change, but such change is hard to measure on a short time-scale. My hope is that the results of this research can provide lines of inquiry to inform ongoing dialogue between the Indigenous research partners and federal and provincial governments in about river navigability protections. The basis for the preceding core CBPR principles is the commitment to empower communities in ways that are meaningful to them.

Emphasis on community empowerment has led CBPR to be recognized as an appropriate methodology for research involving Indigenous people, but some Indigenous scholars argue that CBPR principles should be refined by the addition of principles specifically sensitive to Indigenous peoples' needs (Wilson, 2008). These Indigenous principles are compiled in Appendix A and are briefly explained here. Researchers need to be mindful of the colonial past and the resulting power dynamics between Indigenous and settler peoples which, in this thesis, occurred by using the ESF and IIF together, two frameworks that account for power imbalances between peoples. Indigenous sovereignty was respected by seeking permission to conduct the research and agreement on research protocols through research agreements between the university and the Indigenous research partners. Relationality was explored through the research question about the importance of river navigability to the Indigenous research partners. The constructivist methodology selected for this research recognized three Indigenous principles, including the need to perceive research as a storytelling endeavor, for the researcher to be open about who they are, and for the researcher and research participants to be perceived as co-constructors of the findings. For this research, the Indigenous CBPR principles expanded on the core CBPR principles, and collectively they guided this research.

Collaboration with and empowerment of the Indigenous research partners were incorporated into the preceding discussion on how the core and Indigenous CBPR principles were adhered to in this research, but their elaboration is warranted given their centrality to CBPR. Collaboration began with relationship building as I was unknown to the Indigenous

peoples of the Peace Athabasca Delta at the start of the project. To build relationships, I spent three weeks in the community meeting people, boating in the Peace Athabasca Delta, participating in hunts, and visiting cabins. I also engaged more formally with community leaders by attending Chief and Council and Elders meetings and hosting community meetings about the research. Staff of the Community-Based Monitoring Programs, Office of the FCM, MCFN's Government and Industry Relations office, and the ACFN's Industry Relations Corporation were instrumental in making introductions and helping to organize my participation in meetings and waterscape-based activities. As mutual familiarity grew, research agreements with MCFN, ACFN, and the FCM were discussed and signed that set out the research topic, communications responsibilities, data ownership and management, and responsibilities towards research participants. These research agreements informed the actions that were undertaken to adhere to the CBPR principles as detailed in Appendix A, which were viewed as ongoing commitments rather than discrete tasks. For example, I periodically visited the community to enjoy non-research activities such as the Winter Carnival, hunts, and fiddling events to continue to learn from the people about their way of life. These relationships helped facilitate empowered involvement by Indigenous people in this research because I better understood what constituted respectful research interactions from the perspectives of MCFN, ACFN, and the FCM.

Indigenous participants were empowered to participate in each of the research phases, but full power sharing was not achieved during data analysis and knowledge transmission. The Indigenous research partners were heavily involved in many aspects of the research process: identifying ANF as the research topic; refining the research questions, including the addition of the first set of research questions into the significance of ANF; providing advice on the interview guides, including the addition of feeling-based questions; recommending criteria for selecting research participants, including inclusion of FCM citizens, geographic representation of research participants, and age distribution of research participants; setting data management and ownership requirements that gave the Indigenous research partners ownership of the interview data; and establishing appropriate means of exchanging information about the research and the preliminary research findings (visual formats preferred) between me, research participants, and the wider Fort Chipewyan community. The Indigenous research partners' involvement in data analysis and knowledge transmission was weaker than in the other phases because I alone coded

the data, compared the perspectives shared by research participants, and to date have led the dissemination of research findings outside of the research partners through conference presentations and preparation of this thesis. To partially overcome the power imbalance in data analysis, visual depictions of the conceptual categories and their relationships to each other were discussed with Community Participants to solicit their feedback on the appropriateness, completeness, and accuracy of preliminary findings. However, the review of visual representations is an activity that is separated from the data itself, and so power sharing was not fully achieved. To help ensure knowledge transmission is more equitable, the Indigenous research partners and I are collaborating on a video production about the role of river navigability and boating and the status of their waterscape (Appendix B). The video will be owned by the Indigenous research partners, providing them with opportunities to share their knowledge according to their needs and preferences. Although actions were undertaken to ensure power between me and the Indigenous research partners was balanced throughout the research process, it is important to acknowledge that inequities existed in data analysis and knowledge transmission so that the research is not misrepresented (Wilson, 2008).

Tensions were created by following core and Indigenous CBPR principles within the time, budgetary, and methodological expectations of an academic setting. Relationship building with communities is vital for CBPR but it takes time and needs to respect community circumstances. The timing and duration of my research trips to Fort Chipewyan were altered to accommodate community circumstances (e.g., Elder deaths) and external events (e.g., 2016 wildfire season that required the evacuation of Fort McMurray, a town that is home to many of the Indigenous research partners' citizens). Resultant timeline changes extended the overall duration and cost (e.g., higher accommodation costs for extended stays) of the research project, which made working within the grant timeline and budget difficult for the research team. The timeline and budgetary challenges of CBPR are well documented, but the challenges are worth overcoming because egalitarian research with communities can lead to more accurate and culturally appropriate interpretation of findings and more tangible benefits for communities (see Horowitz et al., 2009).

Another source of tension for me in following the core and Indigenous CBPR principles was accommodating unexpected circumstances in real time that arose during data collection.

For example, one research participant requested that their interview be conducted in a café. During the interview, the research participant invited other café patrons to join in, some of whom then invited people on the sidewalk outside of the café to join in, creating an impromptu focus group of about 20 people. I was uncertain about how to respond as I wanted to be respectful of and responsive to the research participant's preferences, but I also wanted to respect the confidentiality measures in the research agreements and ensure scientific rigor was maintained (i.e. research methods did not include focus groups). In the end, I continued with the interview with the gathered group, but I explained who I was, the purpose of the research, and that the group discussion was being recorded. After the group dispersed, I checked in with the research participant about whether he had any responses to what he heard from the group as it was his perspectives that were being gathered. Simonds and Christopher (2013, p. 2191) provide a constructive means of confronting these tensions so that research may continue:

> We realize the importance of not feeling paralyzed by this idea of 'decolonizing' our research – either as Indigenous people or as non-Indigenous people working in partnership with [Indigenous] communities. The answer, however, is to accept that challenge in spite of our weaknesses and move forward, keeping in our heart our ultimate vision of health equity…

Keeping Simonds and Christopher's words in mind, I moved forward with the research, acknowledging that I had and continue to have much to learn about respectful and meaningful ways to carry out research "on the fly" in partnership with Indigenous peoples.

3.2.3 Applying a Constructivist Grounded Theory Approach

CGT was applied in combination with CBPR to explore both sets of research questions. CGT is an inductive research approach grounded in the standpoint that there are multiple realities that need to be understood within context (Charmaz, 2014; Mills et al., 2006; Nagel et al., 2015). CGT is useful when either little is known about a phenomenon or a phenomenon has not been explored from different points of view (Charmaz, 2014; Nagel et al., 2015). The implications of reduced river navigability from the perspective of male MCFN and ACFN rivers users were explored by Candler et al. (2010), but this research expanded that work to understand the collective meaning that male and female river users from MCFN, ACFN, and the FCM attached to river navigability. Further, non-state actors' perspectives on the influences of state

government adoption of cultural flows have rarely been explored, especially in Canada. Hence, this research expands existing understandings of the meanings of river navigability and cultural flows adoption by incorporating different points of view into data analysis, a key rationale for applying CGT. If CGT offers suitable strategies for exploring the research questions, why then was it combined with CBPR?

Grounded theory methodologies, of which CGT is a variant, and CBPR are often described as different research approaches but have been used jointly in different literatures (see Dick, 2007). CBPR is more of a research orientation rather than a set of methods (Simonds & Christopher, 2013; Hacker, 2013) that can be adapted to accommodate different methodological preferences of partner communities (Horowitz et al., 2009; Padgett, 2012). Grounded theory approaches, including CGT, provide an explicit set of data collection and analytical procedures that are seldom specified in CBPR texts (Dick, 2007). In turn, CBPR provides grounded theorists with the tools to directly engage research participants in the research process to illuminate researcher preconceptions and new ways of interpreting data, two key concerns of grounded theorists who seek deep, original analyses (Dick, 2007). In short, combining CGT and CBPR renders the implicit methodological parts of each research approach more explicit so that scientifically rigorous methods can be maintained within a culturally respectful research approach (Dick, 2007; Padgett, 2012).

In addition to the broader complementarity of CBPR and CGT, their combination was specifically relevant to this research for two reasons. First, the Indigenous research partners viewed research as an outsider's interpretative retelling of their information, a view that was accommodated by applying a constructivist research approach that accepts researchers and research participants as co-constructors of knowledge (Charmaz, 2014; Mills et al., 2006; Nagel et al., 2015). Second, CBPR and CGT share the goal of addressing real world problems to improve lives (see Padgett, 2012 for CBPR; see Charmaz, 2014 for CGT) which was important to me and the Indigenous research partners. Finding a research approach that aligned with the needs and preferences of the Indigenous research partners was vital to developing the relationships necessary for research agreements to be signed between the university and MCFN, ACFN, and the FCM.

Charmaz (2014), recognized as the leading proponent of CGT (Creswell, 2012; Mills et al., 2006; Nagel et al., 2015), articulates how the CGT approach and its procedures can be applied to different extents. Specifically, Charmaz (2014) differentiates between conducting a CGT study and a generic inductive qualitative study based on nine actions. These nine actions, excerpted from Charmaz (2014, p. 15), include the following:

1. Conduct data collection and analysis simultaneously in an iterative process
2. Analyze actions and processes rather than themes and structure
3. Use comparative methods (i.e. constantly comparing data, codes, incidents, and cases to develop categories and concepts)
4. Draw on data (e.g., narratives and descriptions) in service of developing new conceptual categories[24]
5. Develop inductive abstract analytic categories through systematic data analysis
6. Emphasize theory construction rather than description or application of current theories
7. Engage in theoretical sampling
8. Search for variation in the studied categories or process
9. Pursue developing a category rather than covering a specific empirical topic

Charmaz (2014) argues that undertaking the first five actions provides the minimum evidence for a grounded theory study, with all nine actions needed to develop a constructivist grounded theory[25]. Studies not meeting these criteria are categorized as generic inductive qualitative studies. Given the partial overlap between generic qualitative inquiries and CGT studies, Charmaz (2014) encourages researchers to be transparent about the extent to which the CGT approach and procedures were used. Transparency is achieved here through Appendix C which provides an itemized account of how each of the nine CGT actions were implemented for Research Questions 1 and 2. All nine actions were implemented for Research Question 1, indicating that substantive grounded theories of the importance of river navigability and purpose

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[24] When discussing coding, the term 'category' refers to an increasingly analytic label for a theme or pattern observed in several codes (Charmaz, 2014).

[25] Constructivist grounded theories are "substantive theories addressing delimited problems in specific substantive areas" and prioritize understanding over predictive explanation (Charmaz, 2014, p. 10).

of ANF were developed. For Research Question 2, actions 1 to 5 and 8 were fully implemented and actions 6, 7 and 9 were only partially implemented because the low participation rate of Government Participants limited theoretical sampling and the application of the IIF meant that a grounded theory was not constructed (see section 3.3 for further details on why the IIF was applied in this thesis). Hence, a CGT study was undertaken for both research questions explored in this thesis, but to differing degrees.

3.3 Methods

The two distinct but related stories that this research aims to tell through the two sets of research questions require different but overlapping sets of methods. The first set of research questions into the significance of ANF, including the importance of river navigability to the Indigenous peoples of the Peace-Athabasca delta and why ANF were developed, were explored using Charmaz's (2014) CGT data collection and analysis strategies that privilege data over extant theories (Charmaz, 2014; Hood, 2007; Padgett, 2012). By applying Charmaz's (2014) strategies, substantive theories situated in a specific time, place, and set of circumstances were developed that Charmaz describes as socially constructed arrangement of concepts (Charmaz, 2014; Hood, 2007; Padgett, 2012).

A combination of methods was used to explore the second set of research questions into how the adoption of ANF in surface water quantity policy may be advanced in ways mutually acceptable to provincial and federal governments and Indigenous peoples. Charmaz's CGT data collection and analysis strategies were first applied to understand the separate perspectives of Government and Community Participants followed by the application of the IIF in combination with the ESF dimensions. While a substantive theory was not developed for the second set of research questions, being sensitive towards theory development during data analysis and collection helped "bring analytic precision" to the research (Charmaz, 2014, p. 160). Such precision enabled the testing and strengthening of the existing IIF as a tool for exploring innovation adoption when it was initially devised to explore innovation implementation. Strengthening an existing theoretical framework was chosen over developing a new substantive theory because, as Nilsen (2015) contends, a plethora of new theories and frameworks can constrain growth in cross-disciplinary dialogue amongst researchers and practitioners and the

uptake of scientific knowledge that could advance solutions in professional practices (e.g., health, freshwater management). Hence, the application of combined methods to the second set of research questions is considered beneficial to research into the advancement of cultural flows within freshwater governance arenas.

Expanding on the preceding overview, the methods used to explore both sets of research questions examined in this thesis are detailed below. An overview of CGT data collection and analysis strategies is first provided followed by the specific methods for Research Questions 1 and 2.

3.3.1 Overview of Constructivist Grounded Theory Data Collection and Analysis Methods

In CGT, data collection and analysis are simultaneous processes that mutually inform and focus each other (Charmaz, 2014; Butler et al., 2018; Ford, 2010). Data collection in CGT usually begins with purposeful sampling of participants with experiences relevant to the study topics, but it can also include purposeful sampling of topic-relevant materials (e.g., documents, audio or video recordings) (Butler et al., 2018; Charmaz, 2014). Data analysis begins after some data have been collected and uses constant comparison strategies that initially compare data with other data, data with emergent categories and concepts, and finally categories and concepts with other categories and concepts to understand their uniformities and variations (Butler et al., 2018; Charmaz, 2014). The emergence and development of ideas, categories, and concepts; data gaps; and potential data sources to fill the data gaps are recorded in memos (Butler et al., 2018; Charmaz, 2014; Ford, 2010). Since data analysis begins after some data are collected, the emergent ideas, categories, and concepts guide subsequent data collection termed theoretical sampling. Theoretical sampling replaces initial sampling and focuses on the elaboration and refinement of conceptual categories and the identification of their properties and interrelationships (Butler et al., 2018; Charmaz, 2014; Ferguson, 2019; Ford, 2010). Criteria for theoretical sampling depend on the emergent ideas and concepts and may lead to the addition of new interview questions, participants, settings, or an entirely new form of data altogether (Butler et al., 2018; Charmaz, 2014). Data collection and analysis occur until data saturation is achieved, meaning that no new categories and category properties emerge (Charmaz, 2014; Ferguson, 2019; Ford, 2010; Mills et al., 2006).

3.3.2 Data Collection using CGT Strategies for Research Questions 1 and 2

Data were collected from two sources during initial sampling and theoretical sampling for both sets of research questions (Charmaz, 2014; Ford, 2010) (Table 3.2). Initial sampling consisted of gathering data from publicly available documents and semi-structured interviews that were analyzed to identify early categories and their properties. To elaborate and refine emergent categories, more data were subsequently gathered from documents and interviews through theoretical sampling. Collecting data from two types of sources deepened the analysis by facilitating the identification of new lines of inquiry and providing a means to corroborate data collected from one source type with data from the other source type (Charmaz, 2014).

Before detailing the data collection methods, FCM's participation in this research needs to be explained because they were not part of the development and promotion of ANF. MCFN Chief and Council requested that an invitation to participate in the research be extended to FCM to respect the efforts by MCFN, ACFN, and the FCM leaderships to foster relationship-building amongst their citizens and because Métis peoples are also river users reliant on boats to access their territories. To fulfill MCFN Chief and Council's request, FCM citizens were included as research participants in Research Question 1a that asked why is river navigability important to the peoples of the Peace-Athabasca Delta. Due to his participation in CEMA when Indigenous peoples were advocating for river navigability to become an instream flow needs objective, one FCM citizen also participated in Research Question 2 that asked how adoption of ANF in surface water quantity policy can be advanced in ways mutually acceptable to federal and provincial governments and Indigenous peoples. FCM citizens were not included in Research Question 1b that asked why were ANF developed because the Metis were not involved in ANF development or promotion of ANF. Only MCFN and ACFN were involved in developing and promoting ANF. Fulfilling MCFN Chief and Council's request to include FCM perspectives was respected in keeping with the CBPR principle of willingness to adapt research methods to accommodate community preferences (Cochran et al., 2008; Reed & Peters, 2004).

Table 3.2: Data collection methods for Research Questions 1 and 2

Data Collection Method		Research Question		
		1a. Why is river navigability important to the Indigenous peoples of the Peace-Athabasca Delta?	1b. Why were the Aboriginal Navigation Flows developed?	2 a-d. How can adoption of the Aboriginal Navigation Flows in surface water quantity policy be advanced in ways mutually acceptable to state governments and Indigenous peoples?
Document Analysis	Initial selection criteria	• Discusses the value of and role that river navigability plays in the lives of MCFN, ACFN, and FCM • No time frames • Directly expressed in the voices of or explicitly endorsed by MCFN, ACFN or FCM	• Discusses the rationale for and goals of ANF • No time frames • Directly expressed in the voices of or explicitly endorsed by MCFN or ACFN	• Discusses government analyses of, reactions to, or decisions about river navigability and/or ANF OR • Shaped the scope and nature of surface water quantity governance in the Lower Athabasca River, including the use of Traditional Knowledge and organizational mandates (e.g., rules, guidelines) AND • Prepared prior to the release of the SWQMFLAR in March 2015 for non-CEMA documents. CEMA documents had to be dated prior to January 2010 when the P2FC completed its work except for monitoring documents prepared as follow up to the P2FC recommendations. • Results from Research Question 1 were treated as a data source
	No. of documents	12	7	Government narrative – 40 Community narrative – 30
Semi-structured Interviews	Initial selection criteria	• Cultural representation from MCFN, ACFN, and FCM • Geographic cross section of River Users and Elders representing different locations across their territories within the Peace Athabasca Delta • Cross section of ages, including Elders and adult river users Recruitment occurred through recommendations by staff and associates of the Indigenous research partners and Community Participants.	Representation from MCFN and ACFN citizens and associates with knowledge of ANF concepts through participation in their development and/or promotion OR involved in a lead or supporting role in engagement processes with government representatives where surface water quantity (river flows) and Indigenous navigation needs were discussed. Potential research participants were identified using contact lists included in documents and recommendations made by Community Participants.	Government participants: provincial or federal government representative or advisor that was a member of CEMA working on the instream flow needs determination or participated in the preparation of the SWQMFLAR. May be current or former employees of government agencies. Community participants: participated in the development of ANF and/or engagement processes about ANF or river navigability with government agencies leading to the development of surface water quantity policy
	No. of participants	22 Community Participants	18 Community Participants	8 Government Participants 18 Community Participants
	No. of interviews	• 22 initial interviews • 19 interviews for theoretical sampling	• 18 initial interviews • 14 interviews for theoretical sampling	Government Participants: 8 initial interviews and 4 follow up written and verbal exchanges for theoretical sampling Community Participants: 18 initial interviews and 14 interviews for theoretical sampling

3.3.2.1   *Initial Sampling Using Semi-structured Interviews*

Initial sampling consisted of research participants sharing their knowledge and perspectives with me through semi-structured interviews. Semi-structured interviews are guided but not limited by a pre-determined set of open-ended questions and were a requirement of the Indigenous research partners. Indigenous research partners required that interview guides be prepared so that they knew with certainty the type of research their citizens would be participating in and to help translators prepare for interviews with participants preferring to speak in their Indigenous language. The interview guides also became a means for the Indigenous research partners to be involved in piloting the research questions, which revealed the need to include questions that probed peoples' feelings about ANF and its adoption by the GoA (e.g., How does that make you feel?). For consistency, all research participants received a copy of the interview guide prior to their interviews (Appendix D). Charmaz (2014) supports preparation of an interview guide because "planned questions help you improvise in a smoother, less confrontational way" (p. 64). Unconfrontational improvisation during the interview facilitates inquiry into new leads raised by research participants without loaded or narrow questions that could introduce researcher preconceptions into the data (Charmaz, 2014).

Semi-structured interviews were conducted with Community and Government Participants to elicit diverse perspectives on the significance of and the GoA's adoption of ANF. Purposeful recruitment for the initial semi-structured interviews occurred between September 2015 and May 2017, and only individuals that gave free, prior and informed consent were interviewed. All but two interviews were audio recorded as one person chose to provide written responses to the interview questions and one person preferred that I take notes during the interview. The participant selection criteria and the type of interview questions asked varied according to the nature of the research question (Table 3.2; Appendix D).

Research Question 1a: Twenty-two Community Participants from MCFN, ACFN, and FCM and their associates (e.g., consultants) shared their perspectives about the importance of river navigability in their lives of Indigenous peoples living in the Peace-Athabasca Delta. Selection criteria recommended by the Indigenous research partners guided recruitment and included geographic and age representativeness. Geographic representativeness refers to a cross-

section of participants with family ties to different geographic parts of the Peace-Athabasca Delta and Athabasca River mainstem. Documentation identifying individual and family territories that was provided by the Indigenous research partners was used to ensure a geographic cross-section of research participants were identified. The territory documentation is not provided here as it is the Indigenous research partners' confidential information. Age representativeness is more than a group of individuals who have each lived for a different number of years; age encompasses both years since birth and the degree to which the community recognizes an individual's holistic knowledge of their community's philosophies, laws, relationships, and understandings of the waterscape. [26] I relied on individuals acting as liaisons for the project[27] as well as research participants to help me identify a cross-section of people representing different ages. All Community Participants for Research Question 1a were recognized by their community as being an Elder, active river user ranging from young to middle-aged adults, or an associate with intimate knowledge of the Indigenous relationship to the waterscape. I asked them questions about the role that boating plays in their lives, what boating is like now compared to the past, and how does that make them feel. These questions led to lines of inquiry into visions for and feelings about the future status of river navigability in their territories. Collectively, these questions (Appendix D) elicited the meanings that Community Participants attached to river navigability that underpinned the development of ANF, which in turn were sources of data for Research Question 2.

Research Question 1b: Eighteen Community Participants expressed their perspectives on the purpose of ANF. Community Participant recruitment sought individuals with either (i) knowledge of ANF concepts gained by their participation in ANF development or promotion; or (ii) experience discussing Indigenous river navigability needs with federal and provincial government representatives in either lead or supporting roles. Research participants could be

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[26] This definition of age emerged from my conversations with individuals from MCFN, ACFN, and the FCM about the selection of potential research participants and is considered a "working" definition because it helped me operationalize the Indigenous research partners' recommendation to include a broad range of ages in my sample. This definition of age should not be considered definitive or fully representative of how any of the Indigenous research partners organize and recognize knowledge holders in their communities.

[27] Community liaisons are individuals that provided advice on the project from the perspectives of MCFN, ACFN, and the FCM but were not paid by the project. The community coordinator was a paid position.

citizens of or associates providing advisory or consulting services to MCFN or ACFN. One FCM representative was recruited because of their active participation in discussions on the need to address Indigenous river navigability in the SWQMFLAR with government representatives. Identification of Community Participants occurred primarily through the advice of community liaisons for the project but was supported by participant lists included in materials generated by CEMA or the GoA during surface water quantity policy development (e.g., meeting minutes) and recommendations by research participants previously interviewed. During the interviews, I asked questions about why and how ANF were developed, and the timing and desired outcomes of ANF development and promotion. These lines of inquiry provided data on MCFN's and ACFN's objectives for developing and introducing ANF.

Research Questions 2a-d: Eight Government Participants and 18 Community Participants shared their perspectives on the influences on the GoA's adoption of ANF.[28] Government Participants consisted of provincial or federal government representatives or support personnel (e.g., consultants) that were either directly involved in CEMA's consideration of Indigenous river navigability or the evaluation and use of ANF as part of surface water quantity policy development. Government Participants include individuals that are current or former employees of federal or provincial governments or that have changed positions since their involvements in surface water quantity policy development for the Lower Athabasca River. [29] Potential Government Participants were identified from participant lists in materials generated by CEMA or the GoA during surface water quantity policy development (e.g., workshop reports) and recommendations by research participants previously interviewed. Community Participants had to be involved in engagement processes about ANF, river navigability, or surface water quantity management with the GoA in a supporting or leading capacity. Identification of Community Participants occurred primarily through the advice of community liaisons for the project but was

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[28] Alberta Government ministries were reorganized and assigned different names throughout the policy process that is subject of this research (see Chapter 4). For readability purposes, I refer to the Government of Alberta (GoA) instead of the specific ministry names unless a specific ministry was an author of a cited document. Ministry names were included in citations.

[29] Due to their privacy concerns, no further details on the demographic characteristics of the Government Participants are provided (see section 3.5). Alberta Environment and Parks, the provincial department responsible for the SWQMFLAR, did participate and is named here with their permission.

supported by participant lists included in materials generated by CEMA or the GoA during surface water quantity policy development (e.g., meeting minutes) and recommendations by research participants previously interviewed. Government and Community Participants were asked to share their perspectives on how state government representatives perceived and reacted to ANF as a freshwater policy tool; how the state government representatives' perceptions and reactions to ANF changed over time; the communications and engagement undertaken by state governments about ANF; the implications of using ANF directly and in modified form on state governments, MCFN, and ACFN; and on why the GoA modified ANF before incorporating river navigability into the SWQMFLAR. The data collected through the preceding questions revealed the barriers and drivers that influenced the GoA's adoption of ANF as part of the SWQMFLAR from the perspectives of Government and Community Participants.

3.3.2.2 Initial Sampling Using Documents

Documents complemented and supplemented the interview data by providing background and historical information on the policy process leading to the release of the SWQMFLAR. Documents were reviewed before, during, and after interviews and were obtained from four sources: (1) Community and Government Participants, (2) CEMA's online library (http://library.cemaonline.ca/), (3) the GoA resources repository (https://open.alberta.ca/dataset), and (4) the Canadian Environmental Assessment Registry (https://www.canada.ca/en/environmental-assessment-agency/services/environmental-assessments.html) for the Jackpine Oil Sands Project, Jackpine Mine Expansion Project, and the Horizon Oil Sands Project. As the latter three document archives are large, selection criteria were applied to identify documents relevant to each research question (Table 3.2). Research Questions 1a and 1b required documents that described the value or role of river navigability or boating to the community or the rationale for and objectives of ANF, respectively. These documents also had to be prepared by or explicitly endorsed by MCFN, ACFN, or the FCM to ensure that the results captured only their voices. Documents selected for Research Question 2 had to (i) contain government analyses of and perspectives on Indigenous navigation or ANF concepts; (ii) shape the scope and nature of surface water quantity governance, including the use of TK; or (iii) prescribe mandates for participating in policy development (e.g., rules and

guidelines). Documents dated later than March 2015 were also filtered out to prevent perspectives on the implementation of the SWQMFLAR from being captured because Research Question 2 sought to understand ANF adoption. In total, 12 documents were reviewed for Research Question 1a and 7 documents for Research Question 1b. For Research Question 2, the results of Research Question 1, 40 documents representing Government perspectives, and 30 documents representing Community perspectives were reviewed to supplement the small number of research participants, especially Government Participants, triangulate interview data, and provide additional insight into both sets of research questions. Sampled documents are listed in Appendix E.

3.3.2.3   *Theoretical Sampling using Interviews and Documents*

Theoretical sampling is a data collection strategy that begins after tentative categories have emerged so that the categories can be refined, their properties identified, and the relationships between them discovered (Butler et al., 2018; Ferguson, 2019; Ford, 2010; Charmaz, 2014). In this research, theoretical sampling began after the initial interviews described in section 3.3.2.1 were analyzed, although some research participants chose to hold their interviews over multiple days which provided earlier opportunities for theoretical sampling. Theoretical sampling consisted of asking additional questions in follow up interviews and written exchanges with Community and Government Participants that were knowledgeable about the emerging concepts and categories. Examples of the key conceptual categories and gaps that were explored through theoretical sampling differed amongst the research questions and are described in Table 3.3. In 2018, 19 follow-up interviews were conducted with Community Participants for Research Question 1a, and 14 follow-up interviews were conducted with Community Participants for Research Questions 1b and 2. Four follow up exchanges, including written and oral discussions, were conducted with Government Participants. Documents were also an important data source for theoretical sampling, especially for Research Question 2 because of the lower participation rates by individuals representing government perspectives. Document counts for theoretical sampling are included with the initial sampling document counts because most documents were reviewed multiple times. Theoretical sampling occurred until the categories were sufficiently robust that they encompassed the variation in the data, meaning that no new categories or

properties of categories were gleaned from the data (Butler et al., 2018; Ferguson, 2019; Ford, 2010; Charmaz, 2014).

Table 3.3: Examples of the theoretical sampling process used to develop conceptual categories for all research questions

Research Question	Emergent concept after initial sampling and analysis	Theoretical sampling approach	Outcome	New or revised concept and properties
1a: What is the importance of river navigability to the Indigenous peoples of the Peace-Athabasca Delta?	Being okay when bad things happen	Adding new interview questions about how people feel about change and what people need to handle that change in a positive way	Emergent concept was clarified and properties of the concept were expanded on by gaining an understanding that change was an accepted part of life, but that dealing with change required a strong collective identity amongst citizens and the agency to decide how to respond to that change.	Clarified concept: Continuing across change preferentially Properties of concept: • Continuing through change • Possessing agency • Engendering collective identity
	Being connected to the Creator (spiritual health) / how people feel inside (emotional health)	Adding new interview questions to explore Community Participants' understanding of emotional and spiritual health	Confirmed that Community Participants had similar understandings of spiritual health and emotional health and that they were two dimensions of connectivity-based human health	Connectivity-based human health has five dimensions, two of which are spiritual health defined as "being connected to the Creator: and emotional health defined as "how people feel inside"
	Unspoken laws for respecting the land (an *in vivo* code)	Adding new interview questions to determine the resonance and meaning of "unspoken laws" (i.e. what is meant by unspoken)	The term "unspoken laws" resonated with people who grew up in the bush and understood their original laws that governed their relationships with the lands. "Unspoken" refers to the loss of knowledge about the laws amongst younger people and suggests reverence for those laws.	No change in the term itself but it's meaning was better explicated and bounded.
1b: Why were ANF developed?	Listening to river users and Being proud	Adding new interview questions to probe differences between younger and older research participants. In the initial interviews, statements about being proud of ANF development and how listening	New concept was defined and initial categories became properties of the new concept. Older river users and Elders described how listening to river users was important but that they should not be expected to talk. Rather, it was important for their communities,	New concept: Finding strength in ourselves Properties of concept: • Asking river users • Listening to river users • Valuing our knowledge

Research Question	Emergent concept after initial sampling and analysis	Theoretical sampling approach	Outcome	New or revised concept and properties
		to river users was vital to that success were frequently made by younger research participants and staff of MCFN and ACFN but rarely by older river users and Elders.	especially the younger citizens, to ask the river users to share their knowledge as a sign of respect. When people show a desire to learn by asking and listening, the river users will know that their knowledge is valued. Valuing knowledge was described as more important that being proud of one initiative because it was a source of strength for the communities.	
2: How can adoption of the Aboriginal Navigation Flows in surface water quantity policy be advanced in ways mutually acceptable to state governments and Indigenous peoples?	Choosing policy objectives and Addressing a range of sustainability needs (both categories emerged from the government and community narratives)	Adding new interview questions and one additional research participant to probe Government and Community Participants' initial statements about policy-making being subjective and needing to consider a range of preferences.	New category was identified that became a property of a higher level concept. Government Participants who participated in the structured decision-making process under CEMA were found to embrace policy-making as a values-laden exercise because they had to actively select amongst different tradeoffs when evaluating options for water withdrawal rules. All but one Community Participant agreed that policy-making was values-laden. The one dissenting Community Participant argued that policy-making should only rely on data, not values ("evidence-based"), but their comments related to the use of data to inform the tradeoff evaluation, not the selection of objectives underpinning the tradeoff evaluation. The implication of recognizing that policy-making is values-laden is that responsibility is placed on people for outcomes (i.e. people are not subjected to outcomes	New category with the label of "perceiving policy-making as values-laden" became a property of the meaning of policy-making in the government (integrating diverse interests without losing sight of desired goals) and community (being willing to compromise)

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Research Question	Emergent concept after initial sampling and analysis	Theoretical sampling approach	Outcome	New or revised concept and properties
			but rather choose outcomes). Hence, people can use their will to change policy priorities.	
	Avoiding cut-off flows (emergent category from the community narrative)	Adding new interview questions to probe into Government Participant perspectives to understand their decisions to not include the cut-off flows mentioned by Community Participants.	New concept was defined and initial category became a property of the new concept. Distinctions between water conservation objectives, base flows, cut-off flows, and instream flow needs were made. Government Participants did not explain why water conservation objectives were not established under Alberta's *Water Act*, instead indicating that they are implicit in the water withdrawal rules contained in the SWQMFLAR. Government Participants asserted that cut-off flows could not be imposed for existing licenses due to technical (infrastructure maintenance) and legal (court challenges by industry) risks. This led to additional questions probing Government and Community Participant perspectives on whether Alberta's *Water Act* provides the GoA with authority to impose water withdrawal cut-off limits in non-emergency situations.	New concept: Contested legal rules • Contested meanings of emergency • Avoiding water conservation objectives • Avoiding base

3.3.3   Data Analysis for Research Questions 1a and 1b Using CGT Strategies

Data analysis for Research Questions 1a and 1b was guided by Charmaz's (2014) CGT coding strategies. All gathered data source materials, including documents, verbatim interview transcriptions, interview notes, and written exchanges with Government Participants, were initially coded manually, inductively, and line-by-line using gerunds. Charmaz (2014) argues that initial line-by-line coding using gerunds focuses the analysis on actions and processes, making visible the interconnectedness of the codes. Initial coding was followed by the "more directed, selective and conceptual" analytic strategy of focused coding that is used to synthesize and explain larger segments of data using the most significant or frequent codes from initial coding (Ford, 2010, p. 129). Throughout initial and focused coding, data within and between data source materials were constantly compared to check emerging concepts and categories against empirical data and memos were prepared to record ideas, impressions, and categories emerging from the analysis (Charmaz, 2014; Ford, 2010)(Appendix F). To move towards theory development, memos were subsequently sorted to facilitate their comparison at an abstract level and to identify theoretical links between categories. Diagramming was helpful during memo sorting as it allowed different arrangements of categories to be tested visually to determine whether they "fit the logic" emerging from the data (Ford, 2010, p. 134). The arrangements of the most significant theoretical categories, which Charmaz describes as the "analytic concepts of the theory that provide an abstract understanding of the studied phenomenon", are substantive theories (Charmaz, 2014, p. 341-342). Substantive theories about the importance of river navigability to Indigenous peoples of the Peace-Athabasca Delta and the purpose of ANF were developed.

3.3.4   Data Analysis for Research Question 2 Using a Combination of Methods

Data analysis for Research Question 2 was shaped by the application of Steelman's (2010) four step process for applying the IIF (Figure 3.1) under Ermine's (2007) four ESF dimensions (Figure 1.1). Steelman's (2010) process for applying the IIF (Figure 3.1) begins with providing a narrative account of the innovation and the context in which the innovation was implemented to

provide a basis for the subsequent populations of the IIF. Next, the IIF is populated with all factors that played a role in innovation implementation so that insight can be gained about the alignment of the IIF categories in their support for or hindrance of innovation implementation (Steelman, 2010). Subsequently, the relative degree of influence of each IIF factor on innovation implementation is determined so that patterns of influence amongst the factors (e.g., motivation, incentives, framing) can be identified (Steelman, 2010). Last, patterns amongst the IIF categories (individual, structural, cultural) are identified to determine their (mis)alignment (Steelman, 2010). Together, Steelman's (2010) first four steps for applying the IIF provide insights into the alignment of factors that influenced innovation implementation and the endurability of the innovation that are compiled in step five (Figure 3.1)The more aligned IIF factors are, the likelier the innovation will be implemented (Steelman, 2010).
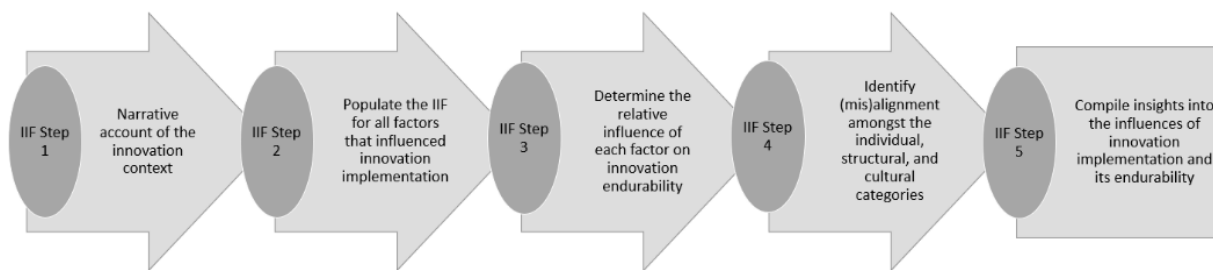
Figure 3.1: Steelman's (2010) process for applying the Implementing Innovation Framework

Merging Steelman's process for applying the IIF (Figure 3.1) under Ermine's ESF (Figure 2.1) for the adoption of an innovation produced a five-step process (Figure 3.2) that guided this research (Figure 3.2) and is explained below.
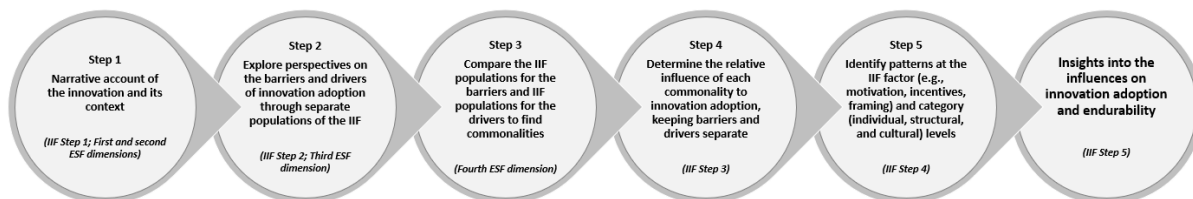
Figure 3.2: Combining the Ethical Space Framework and the Implementing Innovation Framework

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Step 1: A narrative account of the innovation, which in this case is ANF, and the context of its adoption was prepared by synthesizing information from documents, obtained from the same four document sources from which data were collected, including research participants, CEMA's online library, GoA's resources repository, and the Canadian Environmental Assessment Agency registry (see section 3.3.2). Step 1 fulfills the first step of the IIF application (narrative account) and the first (acknowledgement of human diversity) and second ESF (deliberate agreement amongst peoples to engage with each other) dimensions.

Step 2: Government and Community Participant perspectives on the barriers to and drivers of GoA's adoption of ANF were explored using the IIF factors and presented as four separate populations of the IIF. The four populations include government narrative on barriers; government narrative on drivers; community narrative on barriers; and community narrative on drivers. The barriers and drivers constituting Government and Community Participant narratives were identified using Charmaz's (2014) data analysis strategies described in section 3.3.3, which, briefly, include line-by-line initial coding, focused coding, memo writing and sorting, and diagramming conceptual categories to produce arrangements that "fit the logic" emerging from the data (p. 213). Arrangements of conceptual categories were constructed for the two government narratives and two community narratives from which core categories were identified (Appendix G). The core categories, termed keystone factors in this thesis, were the most influential IIF factors on the GoA's adoption of ANF as perceived by Government and Community Participants (Appendix G). Keystone factors can oppose or support the adoption of the ANF and were shaped through the interaction of the suite of barriers and drivers to the adoption of the ANF identified by Government and Community Participants. The conceptual category arrangements for the government and community narratives were subsequently reorganized to populate the IIF four times. Populations of the IIF included all factors that played a role in ANF adoption regardless of their relative degree of influence in accordance with the second step in Steelman's (2010) process for applying the IIF and to enable a full comparison of the populations described in step 3. Step 2 fulfills the second step of the IIF application and the third ESF dimension.

In addition to fulfilling the third ESF dimension, presenting the government and community narratives separately helped address concerns raised by the Indigenous research

partners that social science blends their voices together or with the voices of "outsiders" so that they can no longer see their knowledge in the research products. By presenting the narratives separately, my hope is that the Community Participants can more clearly see their knowledge reflected in this research and how it was used to generate research findings.

Step 3: The two IIF populations for the barriers and the two IIF populations for the drivers were compared to identify commonalities understood in this thesis to be the drivers or barriers, or elements of barriers and drivers, found in both Community and Government Participant narratives. That is, commonalities are those areas where the two narratives partially or fully converged, representing the barriers and drivers at least partially identified by Government and Community Participants. Commonalities were identified by the author using Charmaz's (2014) constant comparison strategies (see section 3.3.3) and were recorded in memos. The analytic reflection enabled through memo writing led to the addition of partially convergent IIF factors to the list of commonalities because they too represented areas where mutual understanding between Government Participants and MCFN and ACFN was starting to be achieved. In contexts where relationships are strained, even partial mutual cross-cultural understanding can be entry points for dialogue (Different Knowings, 2011). The commonalities in the barriers and drivers that acted to oppose and support the GoA's adoption of ANF in surface water quantity policy, respectively, are presented separately in this thesis. Step 3 fulfills the fourth ESF dimension (finding commonalities).

Step 4: Commonalities within the barriers and drivers were assessed to determine their relative degree of influence on the GoA's adoption of ANF. Through the CGT data analysis strategies of constant comparison and diagramming that were undertaken in Step 2, the relationships between different barriers and drivers, including their relative influence, were identified. The information used to determine the barriers' and drivers' relative influence came from interviews and included verbal cues (e.g., direct statements about factor importance such as "the hardest problem"), oral or visual cues (e.g., how the participants' voices sounded or tears), and the number of research participants that raised the factor. Memos were used to capture the relative influence of the barriers and drivers, enabling the relative influence of the commonalities to be determined after the comparisons of the IIF populations in Step 3 were completed. Ordered lists showing the

relative degree of influence of the commonalties in the barriers and drivers were produced. Step 4 fulfills the third step of the IIF application (determine the relative influence of each factor).

Step 5: Patterns in the commonalities at the IIF factor (e.g., congruence, resistance, shocks) and category (individual, structural, cultural) levels were qualitatively identified using the ordered lists of commonalities from Step 4. Step 5 fulfills the fourth step of the IIF application (finding patterns at the IIF factor and category levels).

By following the five steps of the process flowing from the merger of Steelman's IIF application process with Ermine's four ESF dimensions, insights into the influences on the GoA's adoption of ANF in surface water quantity policy were gained. The insights into the influences in turn indicated concrete actions that can be undertaken by state governments in Canada, MCFN and ACFN to advance ANF in ways mutually acceptable.

3.5 Summary

The methodology of this research had dual goals. First, the methodology had to align with the needs of the Indigenous research partners and my own ontological, epistemological, and axiological inclinations. Fortunately, my inclinations and the Indigenous research partners' needs overlapped, including preferences for egalitarian research that recognizes multiple realities and the embedded role of the researcher in studies. Second, the methodology needed to knit together two distinct but related sets of research questions while still respecting their differences. Consequently, a multi-layered methodology was used. Overarching the research was the application of the ESF as the theoretical lens, CBPR that encompasses core and Indigenous principles as the primary research approach, and CGT as the complementary supporting research approach. The first set of research questions into the significance of ANF, including the importance of river navigability to the Indigenous peoples of the Peace-Athabasca Delta and the rationales underpinning ANF development, were explored using CGT data collection and analysis methods to produce substantive theories. The results from the first set of research questions informed the second set of research questions into the mutually acceptable advancement of ANF within cross-cultural freshwater governance arenas led by state governments in Canada. The second set of research questions were explored by applying CGT

data collection and analysis methods in combination with Steelman's (2010) process for applying the IIF and Ermine's four ESF dimensions. Padgett (2012) argues that mixing qualitative approaches with complementary philosophical paradigms can provide new insights about a phenomenon while remaining scientifically rigorous. Hence, the findings of this research into ANF which begin to be presented in the next chapter have the potential to provide new insights into pragmatic actions that will facilitate the adoption of cultural flows as a freshwater policy tool more broadly.

CHAPTER 4 – A CONTEXTUALIZED NARRATIVE OF POLICY-MAKING ACCOMMODATING INDIGENOUS NAVIGABILITY OF THE LOWER ATHABASCA RIVER REGION, ALBERTA, CANADA

4.0   Introduction

Chapter Four provides a contextualized narrative of the surface water quantity policy process that was informed by ANF. MCFN and ACFN proposed ANF to inform SWQMFLAR development, the first regional surface water quantity management policy for the Lower Athabasca River ever developed. The policy process lasted approximately 15 years and consisted of three phases culminating in the release of the SWQMFLAR in March 2015 (Figure 4.1). The first two policy development phases used a collaborative consensus-seeking approach that brought together representatives from governments, industry, Indigenous peoples, and environmental advocacy groups to make recommendations about the management of Lower Athabasca River flows. The third, or last, phase was led by the GoA, in cooperation with the Department of Fisheries and Oceans Canada (DFO), who used the outcomes of the first two phases, ANF, and additional input gathered during stakeholder reviews of draft policy documents to finalize the SWQMFLAR. This last phase was consultative and cooperative but not consensus seeking; feedback from regional interest groups was sought on draft policy documents, but the GoA retained final decision-making authority as provided under Alberta's *Water Act*. Although ANF were developed and introduced into the third phase of policy development, a summary of the entire 15 years is provided below because policy outcomes associated with ANF can only be fully understood through an awareness of how earlier institutional circumstances influenced institutions in the later years through which ANF were considered by provincial governments.
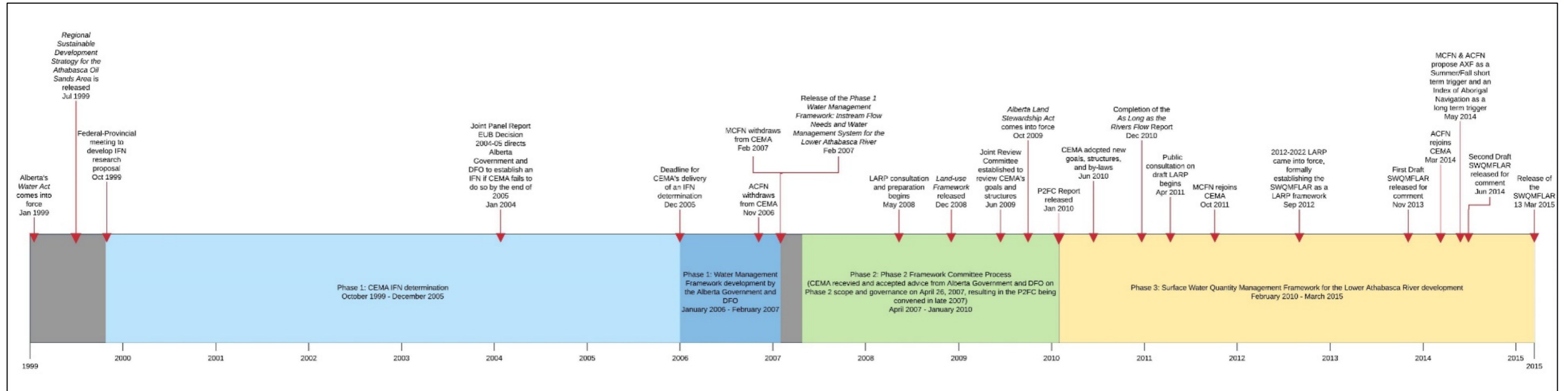
Figure 4.1: Timeline to develop surface water quantity management policy for the Lower Athabasca River Region, 1999-2015

4.1 Contextualizing Aboriginal Navigation Flows

4.1.1 Hydrological Setting

The Athabasca River is the third longest river in Alberta, Canada, and North America's third longest undammed river (Franzin & Instream Flow Needs Technical Task Group [IFNTTG], 2009). Draining approximately a quarter of Alberta's land area, the Athabasca River flows northeastwards 1,538 kilometres from its headwaters in the Rocky Mountains to Lake Athabasca (Noble et al., 2014; Timoney, 2013) (Figure 4.2). The Athabasca River basin can be divided into upper, middle and lower reaches based on their distinctive physical geographies (Eun et al., 2017) and the dominant economic activity within each region (Alberta Environment, 1999). This research focusses on the Lower Athabasca River region (Figure 4.2).

The Lower Athabasca River region extends from 135 kilometres upstream from the town of Fort McMurray to the Athabasca River Delta (GoA, 2015). The Lower Athabasca River is approximately 300 kilometres long and is a shifting sand bed river (Franzin & IFNTTG, 2009). Lowest flows occur in January to March when the river is ice covered and summer flows are the most variable (Franzin & IFNTTG, 2009). At the most northerly or downstream section of the Lower Athabasca River, the river channel divides into numerous distributaries of the Athabasca River Delta (Franzin & IFNTTG, 2009; Timoney, 2013). The Athabasca River Delta converges with the Peace River and Birch River Deltas at the western end of Lake Athabasca to form the Peace-Athabasca Delta, one of the largest inland freshwater deltas in the world (Schindler et al., 2007) (Figure 4.2). The Peace-Athabasca Delta is sustained through hydrological interactions between the Athabasca River, Peace River, and Lake Athabasca (Carver & Maclean, 2016; Peters et al., 2006; Rokaya et al., 2019). Traditional Knowledge (Candler et al., 2010) and Western Science (Schindler & Donahue, 2006) indicate that Lower Athabasca River summer flows have declined over the last several decades, which has implications for the aquatic ecosystems, Indigenous peoples, as well as economic development dependent on freshwater within the Lower Athabasca River.
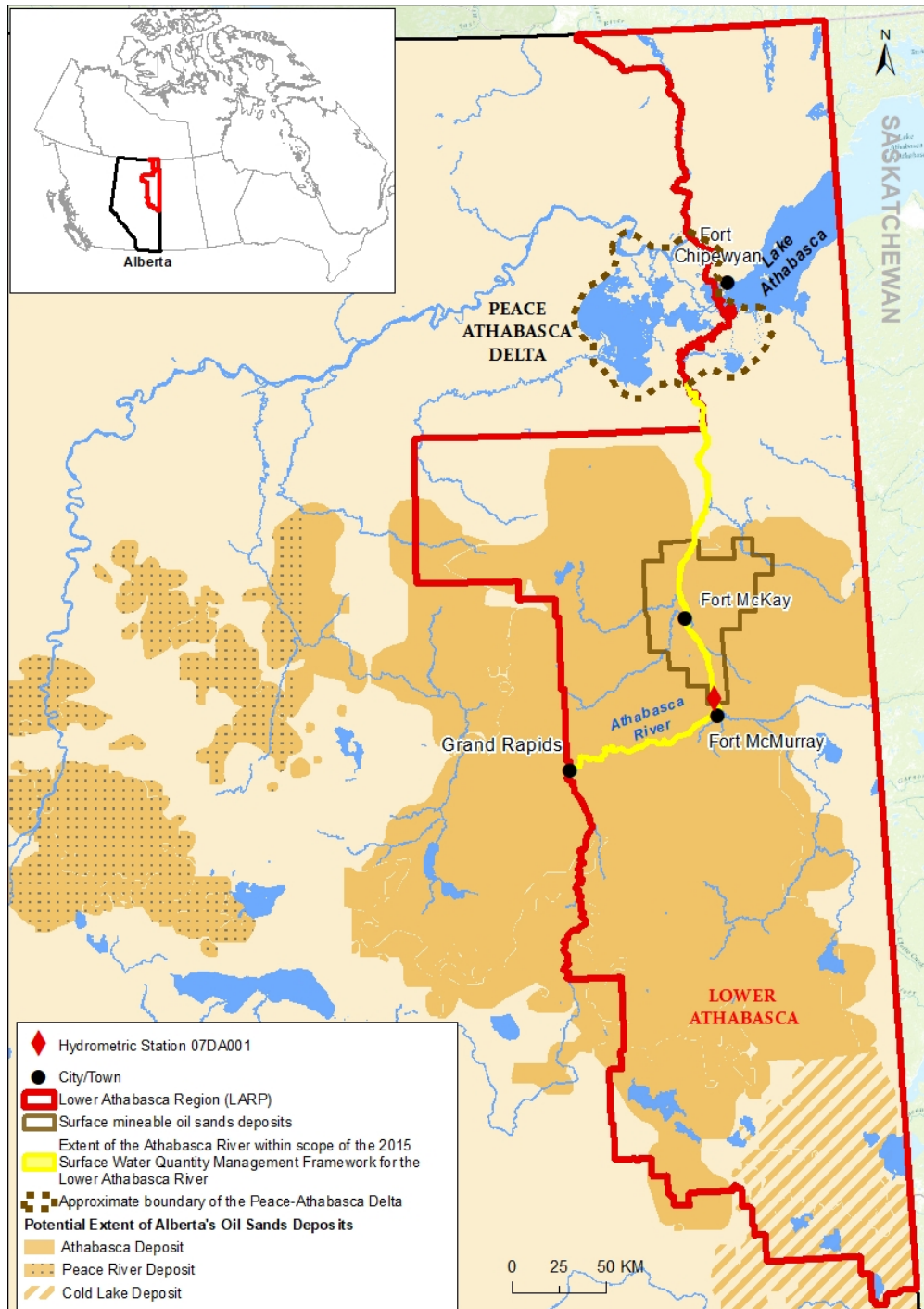
Figure 4.2: Geography of the Lower Athabasca River Region

Map prepared by the Social Science Research Laboratories, University of Saskatchewan, using GIS data provided by the Informatics Branch of Alberta Environment and Parks under End User License Agreement for Digital Data, DMR# 1708K05, dated August 18, 2017 and held by S. Baines. GIS data products: Watersheds of Alberta (GoA); Hydrologic Unit Codes of Alberta; RMWB; and Athabasca Oil Sands Potential Play.

4.1.2 Socio-economic Setting

The downstream reaches of the Lower Athabasca River, including the Peace-Athabasca Delta include the territories of Dene (Chipewyan), Cree, and Metis peoples. The Dene and Cree peoples signed an adhesion to Treaty No. 8 in Fort Chipewyan in 1899 (Figure 4.3), creating two Indian Bands now known as ACFN and MCFN, respectively (McCormack, 2010). Presently, the Metis peoples are represented politically at the local level by the Fort Chipewyan Métis Nation of Alberta Local #125 (FCM). MCFN, ACFN, and FCM consider their home community to be Fort Chipewyan located on the northwestern shore of Lake Athabasca (Figure 4.2). Fort Chipewyan, established as a trading post and services centre for the fur trade due to its proximity to navigable waterways, is a largely Indigenous community that remains dependent on the waterscape as travel corridors. With few roads in the area, boating is the only mode of transport in the summer months providing access to some Indian Reserves, other communities in the region, and hunting, trapping and fishing grounds located throughout MCFN's, ACFN's, and FCM's territories (Candler et al., 2010).

Hunting, trapping, and fishing were historically and continue to be vital to the citizens of MCFN, ACFN, and FCM. Treaty commissioners noted that retaining the ability to hunt and fish were key issues to MCFN and ACFN during treaty negotiations:

> *Our chief difficulty was the apprehension that the hunting and fishing privileges were to be curtailed.* The provision in the treaty under which ammunition and twine is to be furnished went far in the direction of quieting the fears of the Indians, for they admitted that it would be unreasonable to furnish the means of hunting and fishing if laws were to be enacted which would make hunting and fishing so restricted as to render it impossible to make a livelihood by such pursuits. But over and above the provision, *we had to solemnly assure them that only such laws as to hunting and fishing as were in the interest of the Indians and were found necessary in order to protect the fish and fur-bearing animals would be made, and that they would be as free to hunt and fish after the treaty as they would be if they never entered into it* (Sifton, 1899) (author's emphasis added).

Hunting, trapping, and fishing provisions were included in Treaty No. 8[30] (Gutman, 2018), but MCFN and ACFN assert that their ability to carry out those treaty right is disrupted as a result of

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[30] Treaty No. 8 terms pertaining to hunting, trapping, and fishing are the following (https://www.aadnc-aandc.gc.ca/eng/1100100028813/1100100028853):

altered river flow regime caused by upstream natural resource development on the Peace and Lower Athabasca Rivers[31] (Candler et al., 2010). FCM, although not a treaty signatory, also report that they are experiencing disruptions to their ability to hunt, trap, and fish within the Lower Athabasca River region. Altered flow regimes are causing some waterways to become impassable by boat, the primary mode of transport within their territories, and limiting the times of year when other waterways may be accessed. MCFN, ACFN, and FCM assert that as navigability of waterways declines, access to harvesting sites becomes limited, altering how hunting, trapping, and fishing are practiced.

MCFN, ACFN, and FCM were concerned about upstream surface mineable oil sands development on the Lower Athabasca River. Oil sands are mixtures of sand, water, clay, and bitumen (a type of heavy oil) with an aerial extent of 142,200 km^2 in northern Alberta (GoA, 2017). Of that total area, about 4,800 km^2 are recoverable by surface mining methods (GoA, 2017). The surface mineable oil sands, located within the Athabasca Deposit between Fort McMurray and Fort Chipewyan (Figure 4.2), are significant for two reasons. First, the Athabasca Deposit is economically significant because it is "the largest, most developed and utilizes the most technologically advanced production processes" in the world (Canadian Association of Petroleum Producers, 2019). In the 2014-2015 fiscal year that the SWQMFLAR was released, oil sands royalties received by the GoA amounted to just over $5 billion, which covered 10% of that year's provincial operational expenses (Dobson, 2015). Second, surface mining oil sands production is the largest consumptive use of water in the Lower Athabasca River region (GoA, 2015), ranging from 1.1 to 4 barrels of freshwater (surface and ground water) per barrel of oil from 2014 to 2018 (Alberta Energy Regulator, 2019). As of 2018, the surface mineable oil sands industry was allotted less than 2.5% of the Lower Athabasca River's average annual flow (Alberta Environment and Parks, 2016). The GoA asserts that this allocation

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they shall have right to pursue their usual vocations of hunting, trapping and fishing throughout the tract surrendered as heretofore described, subject to such regulations as may from time to time be made by the Government of the country, acting under the authority of Her Majesty, and saving and excepting such tracts as may be required or taken up from time to time for settlement, mining, lumbering, trading or other purposes.

for such Bands as prefer to continue hunting and fishing, as much ammunition and twine for making nets annually as will amount in value to one dollar per head of the families so engaged in hunting and fishing.

[31] The Peace River is regulated by the W.A.C. Bennet dam (construction completed in 1968) and the Peace Canyon Dam (construction completed in 1980).

insignificantly impacts river flows (GoA, 2015), but MCFN and ACFN report experiencing it as harmful to their uses of the waterscape, especially during periods of low flows in the spring and fall hunting seasons (Candler et al., 2010). Consequently, management of water withdrawals from the Lower Athabasca River to support oil sands mining is contentious.

Figure 4.3: Treaty No. 8 territory
(Library and Archives Canada, MIKAN no. 3842345)

4.2   Developing Surface Water Quantity Policy for the Lower Athabasca River

4.2.1 Phase 1: Determining the Instream Flow Needs and Interim Water Management System for the Lower Athabasca River

The first phase of the development of surface water quantity policy for the Lower Athabasca River was initiated by the GoA as part of its implementation of the 1999 *Regional Sustainable Development Strategy for the Athabasca Oil Sands Area* (RSDS) (Alberta Environment, 1999). The RSDS, a framework for managing cumulative environmental impacts

of the oil sands industry, was developed in response to public and federal and provincial government concern about impacts of a rapidly expanding oil sands industry on the long-term ecological health of the Lower Athabasca River (Alberta Environment, 1999). The RSDS consisted of action plans to resolve 72 prioritized regional ecological issues using a shared stewardship model (Alberta Environment, 1999). To operationalize the shared stewardship model, the GoA, in partnership with federal government departments, convened the Cumulative Environmental Management Association (CEMA) in 2000 as a multi-stakeholder, primarily industry funded[32], consensus-seeking collaborative responsible for executing 37 of the RSDS action plans (CEMA, 2007). CEMA members included federal and provincial governments, Indigenous peoples, surface mineable oil sands companies, forestry companies, environmental and social advocacy groups, municipal governments, and interested citizens as members (CEMA, 2007). Due to the wide range of ecological issues that CEMA was to address, smaller working groups were established to focus on specific issues. One such working group was tasked with determining the defensible, science-based instream flow needs of the Lower Athabasca River and its tributaries[33] (Alberta Environment, 1999) to inform surface water quantity policy development for the Lower Athabasca River.

The instream flow needs, defined as the flow regime needed for full, long-term protection of the Lower Athabasca River aquatic ecosystem (Golder Associates, 2004), were to be the ecological thresholds guiding regulation of consumptive water uses from the Lower Athabasca River by the surface mineable oil sands industry. The GoA's authorities to determine the instream flow needs of the Lower Athabasca River were provided by the discretionary provisions related to water management planning and water conservation objectives in Alberta's *Water Act, 2000* that came into force in 1999 (Hardy & Richards, 2005). Water conservation objectives are defined under section 1(1)(hhh) of the *Water Act, 2000* as the amount and quality of freshwater necessary for the protection of aquatic environments, tourism, recreation, transportation, and waste assimilation, and management of fish and wildlife. Legislative support at the federal level was provided by section 35 of the federal *Fisheries Act* because fish biology

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[32] The oil sands industry provided the funding for CEMA with in-kind support from all other members (Franzin & INFTTG, 2009).

[33] The Muskeg River was identified as the tributary of most concern in the RSDS (Alberta Environment, 1999).

and ecology were important inputs into the instream flow needs. Due to their intersecting mandates related to freshwater ecosystem protections, the GoA and DFO were members of the working group dedicated to establishing the instream flow needs. The GoA and DFO also retained their status as the lead government regulators with final decision-making authority over the application of the instream flow needs in the regulation of consumptive water use by the surface mineable oil sands industry.

Initially, the instream flow needs were to be established within two to three years, but technical challenges experienced by the instream flow needs working group doubled that timeline. Technical challenges were intense because in the early 2000s, little scientific knowledge was available about establishing the instream flow needs for cold region rivers and actual freshwater consumption by the oil sands industry was unknown. The instream flow needs working group commissioned ecological and hydrological studies to help fill the knowledge gaps, but the need to conduct the studies caused delays and required significant resources, including funding from the oil sands industry and in-kind supports from government staff, Indigenous peoples, and environmental advocacy groups. Attempts to address the time delays and resource constraints were made at the operational level through scoping work by the instream flow needs working group to define and delimit the establishment of the instream flow needs. Some of the instream flow needs working group's scoping decisions consisted of the following:

- Oil sands freshwater needs were not going to be factored into the instream flow needs determination (Golder Associates, 2004). The instream flow needs determination was to be an ecological threshold.
- The instream flow needs determination was to factor in the full length of the Lower Athabasca River mainstem from just downstream of Grand Rapids to where the river drains into Lake Athabasca (Franzin & IFNTTG, 2009; Golder Associates, 2004).
- Interactions between the Lower Athabasca River and groundwater were excluded because groundwater was deemed an insignificant contributor to Lower Athabasca River annual flows (Franzin & IFNTTG, 2009).
- Connectivity between the Lower Athabasca River mainstem, its tributaries, and riparian zone was excluded despite being acknowledged as important components of the instream flow needs work (Franzin & IFNTTG, 2009).

Despite the instream flow needs working group's efforts to define and delimit the instream flow needs work, the establishment of the instream flow needs was still far from being completed in 2004 when joint review panels were convened under the *Canadian Environmental Assessment Act* for the Horizon Oil Sands Project (EUB Decision 2004-005) and the Jackpine Oil Sands Project (EUB Decision 2004-009). The joint review panels heard from government, Indigenous, and environmental advocacy organizations that instream flow needs establishment was vital and that timelines for its establishment should be set. Agreeing with the need for timely establishment of the instream flow needs, the joint review panels recommended in their environmental assessment reports that the GoA and DFO should bilaterally establish the instream flow needs if CEMA failed to do so by December 31, 2005. The federal and provincial governments accepted the joint review panels' recommended timeline and process for establishing the instream flow needs of the Lower Athabasca River.

CEMA's contested governance structure also hampered CEMA's ability to complete the instream flow needs work, breaking down relationships needed for a consensus-oriented collaboration. Tanner (2008) found that CEMA members, including federal and provincial governments and oil sands companies, supported the involvement of First Nations in CEMA working groups, but that Indigenous peoples' "participation and capacity within [CEMA] was not openly promoted" and that "because of [CEMA's] structure…First Nations did not have the authority or power to influence how things were managed, or how environmental impacts were mitigated" (p. 87). First Nations members of CEMA also objected to their being positioned in CEMA as one of the many groups with interests in the region because they perceived themselves as holding priority rights in the region over industry, a position that CEMA did not recognize. CEMA accepted the criticisms of its governance structures and commissioned independent strategic and program evaluations by two different consultancies in 2008 (see Integrated Environments and Tumbleweed Consulting Ltd., 2008 and PriceWaterhouseCoopers LLP, 2008). Using the program evaluations and information provided by its members, CEMA underwent a restructuring process that resulted in the adoption of new structures, goals, and by-

laws in 2010. However, CEMA's governance restructuring process was too late for ACFN and MCFN who withdrew from CEMA in November 2006 and February 2007, respectively.[34]

CEMA was unable to overcome the technical and governance challenges and reach consensus on the instream flow needs by the deadline of December 31, 2005 imposed through the environmental assessments of the Horizon and Jackpine oil sands projects. Consequently, the GoA and DFO bilaterally developed the *Water Management Framework: Instream Flow Needs and Management System for the Lower Athabasca River* (Phase 1 Framework), releasing it in February 2007. The Phase 1 Framework was the first policy developed to help fulfill the instream flow needs commitments made by the GoA in the 1999 RSDS, and in developing the Phase 1 Framework, the GoA and DFO fulfilled their commitments made during the Horizon and Jackpine environmental assessments.

This Phase 1 Framework introduced a phased approach to completing the instream flow needs work instead of identifying an instream flow needs and established interim water withdrawal rules for the surface mineable oil sands industry (Alberta Environment & Department of Fisheries and Oceans Canada [DFO], 2007). The water withdrawal rules (i) prioritized surface mineable oil sands freshwater needs over other water diversions because they were the largest consumptive water user in the Lower Athabasca River region; and (ii) applied to only two reaches of the Lower Athabasca River instead of its entire length because data availability was greater for these reaches and they were immediately affected by oil sands water withdrawals. The two reaches of the Lower Athabasca River addressed by the Phase 1 Framework included those that flowed past the existing oil sands plants and were immediately downstream of the plants' water withdrawal sites (Alberta Environment & DFO, 2007). Integral to the Phase 1 Framework interim approach were a set of commitments that were to be fulfilled during Phase 2 of the development of surface water quantity policy for the Lower Athabasca River. These commitments were based on a collaborative, consensus-seeking approach and included:

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[34] Feeling cautiously optimistic about the restructured CEMA, MCFN and ACFN reactivated their membership in 2011 and 2014, respectively but by then CEMA's work on the IFN and related surface water quantity management rules had been completed.

- Inclusion of social and economic objectives in addition to the environmental objectives that drove Phase 1 (Alberta Environment & DFO, 2007), which reflected in part the advocacy efforts by CEMA's Indigenous members to have their river uses such as river access and travel recognized and accommodated in policy.
- Establishment of the instream flow needs for the full length of the Lower Athabasca River.
- Continuation of research into a base flow, a natural science-based threshold flow below which a component of the aquatic environment is considered stressed, and its application as a threshold below which all industrial water withdrawals would cease (Alberta Environment & DFO, 2007).

These preceding commitments signaled that the GoA and DFO intended to enhance the protections for the Lower Athabasca River provided in the Phase 1 Framework and expand the instream flow needs work to include water withdrawal rules during Phase 2 (Alberta Environment & DFO, 2007).

4.2.2 Phase 2: Refining Water Withdrawal Rules by the Phase 2 Framework Committee

Phase 2 consisted of a highly structured, two-year process undertaken by the Phase 2 Framework Committee (P2FC) that intended to fulfill the commitments made by the GoA and DFO in the Phase 1 Framework (Ohlson et al., 2010) (Figure 4.1). The P2FC was convened as an inclusive, consensus-seeking collaborative under CEMA that was professionally facilitated by individuals experienced in structured decision-making within complex freshwater governance arenas (Gregory et al., 2012). P2FC members included three GoA departments and regulators, two federal departments, seven oil sands companies, three non-governmental organizations, two Indigenous groups, and three observers (one non-governmental organization, one municipal government, and one Indigenous group) (Ohlson et al., 2010). Collectively, the P2FC members were to negotiate and reach agreement on a set of water withdrawal rules to "manage the long term, cumulative oil sands mining industry water withdrawals from the Athabasca River" (Ohlson et al., 2010, p. i). December 2009 was contractually set as the hard deadline for the P2FC to provide their recommendations to the GoA and DFO so that they could develop a revised framework that would replace the Phase 1 Framework.

Due to the mistrust amongst CEMA members, built up during Phase 1, over CEMA's governance structure and inability to establish an instream flow needs, relationships between P2FC members were so strained at the start of Phase 2 that they "could hardly be in the same room together" (Government Participant 15). Indigenous CEMA members were especially mistrustful of any CEMA collaborative, and only two out of the nine Indigenous CEMA members, including Fort McKay First Nation and the Fort Chipewyan Métis Local #125 agreed to be active on the P2FC.[35] The GoA and DFO attempted to repair relationships with Indigenous CEMA members in part by hiring the expert facilitators in structured decision-making who asserted that constitutionally protected Aboriginal and treaty rights would not be altered by the Phase 2 recommendations. MCFN and ACFN, two of the Indigenous peoples who refused to become P2FC members, rejected the facilitators' assertion that their rights would not be altered, contending that, while treaty terms would not be rewritten, any policy about surface water use has the potential to affect how MCFN and ACFN exercise their Aboriginal and treaty rights. To MCFN and ACFN, changes in how they exercised their Aboriginal and treaty rights were alterations of those rights. MCFN and ACFN also continued to advocate for their rights to be recognized as original rights, and therefore, the priority rights in the region alongside other First Nations' rights. Since the P2FC did not adopt MCFN's and ACFN's positions about rights alterations and priority, MCFN and ACFN chose to be informal observers of the P2FC through bilateral information sharing with the GoA on a government-to-government basis during Phase 2. The active P2FC members with the help of the facilitators attempted to regain their mutual trust so that they could collaborate on recommending water withdrawal rules for the Lower Athabasca River.

As part of building their relationships, the active P2FC members negotiated a common goal for developing water withdrawal rules that reflected the commitment in the Phase 1 Framework to include social, economic, and environmental objectives in Phase 2. Specifically, the P2FC's common goal was the need "[t]o manage water withdrawals from the Lower

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[35] The Indigenous members of CEMA included MCFN, ACFN, Chipewyan Prairie Dene First Nation, Fort McKay First Nation, Fort McMurray First Nation, Conklin Métis Local #193, Fort Chipewyan Métis Local #125, Fort McKay Métis Local #63, Fort McMurray Métis Local #2020 (Tanner, 2008). Only Fort McKay First Nation and the Fort Chipewyan Métis Local #125 were active members of the P2FC (Ohlson et al., 2010) as all other Indigenous groups had withdrawn their membership. Fort McMurray Métis Local #2020 was sometimes a formal observer of the P2FC (Ohlson et al., 2010).

Athabasca River in a manner that supports ecosystem health, traditional use, public use, and sustainable economic development, while encouraging learning and adaptation over time" (Ohlson et al., 2010, p. 17). Keeping this common goal in mind, the P2FC members identified and evaluated the consequences of alternative sets of water withdrawal rules on collectively defined objectives for the entire length of the Lower Athabasca River. P2FC members learned that, although measuring the consequences of the alternatives on objectives was quantitative, the selection of objectives and assessing the acceptability of consequences was subjective. The "hard discussions on tradeoffs" depended on "people willing to challenge each other openly and answer questions" (Government Participant 8). Hence, strong relationships were important in achieving the diverse objectives of the P2FC members.

The P2FC did not achieve consensus on one set of water withdrawal rules, but it did agree on a set of principles to guide the GoA's and DFO's development of a revised surface water quantity management framework. The agreed-to principles included the need for water withdrawal rules to become more restrictive as river flows decrease, and that the level of needed protection varied across the seasons (summer required lesser protections while mid-winter and late winter/early spring required greater protection). P2FC members also agreed that a mitigation such as off-stream freshwater storage to allow existing oil sands companies to access some freshwater year-round was a needed component of surface water quantity management. The area of non-consensus was whether a base flow should be applied as a "cut-off" threshold below which all surface mineable oil sands water withdrawals would stop. To help overcome the stalemate over base flows, the GoA and DFO proposed that a base flow be imposed as a cut-off threshold for all new mines and that a small exemption from the base flow be applied to existing mines (Ohlson et al., 2010). The exemption would allow existing mines to withdraw small amounts of freshwater below their licensed rates all year regardless of the river flow condition.[36] Oil sands companies with existing mines agreed to base flow exemptions that were lower than

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[36] The GoA and DFO cooperatively proposed a base flow of 87 m³/s to protect fisheries, but also included a combined exemption of 1.6 m³/s to existing and future oil sands operators (i.e. each operator would be authorized to withdraw up to 0.2 m³/s of freshwater from the Lower Athabasca River to prevent infrastructure freeze up when river flows fell below 87 m³/s) (Ohlson et al., 2010). This exemption was controversial, with perspectives amongst P2FC members ranging from the need to increase the exemption withdrawal rate, especially for the senior licensees, Suncor and Syncrude, to the elimination of the exemption. After further discussions, the base flow exemption was increased by the P2FC to 4.4 m³/s, allotting 2.0 m³/s to each of Suncor and Syncrude[36] and 0.2 m³/s to both Albian Muskeg River and Canadian Natural Resources Horizon oil sands projects (Ohlson et al., 20100.

their licensed amounts[37], but the P2FC, collectively, could not agree on the size of the exemptions; whether the elimination of exemptions would increase aquatic ecosystem protections due to lack of biological information; and the legal and policy mechanisms for changing senior license holders' existing water rights that were preserved when Alberta's *Water Act* came into force in 1999 (Ohlson et al., 2010). P2FC members were unable to reconcile their differing opinions on the base flow exemption and, hence could not agree on a set of water withdrawal rules, by the December 2009 deadline that was set for the P2FC to complete their work.

Protections for Indigenous river uses were also unable to be confirmed by the P2FC within their timeline. As committed to in the Phase 1 Framework, social objectives, including Indigenous river uses, were incorporated to the instream flow needs work during Phase 2. Traditional use studies conducted for the P2FC established a link between oil sands water withdrawals, freshwater levels within the Lower Athabasca River, and river navigability, leading to the identification of river navigability as a critical measure of the consequences of different water withdrawal rules on Indigenous river uses (Ohlson et al., 2010). Subsequently, the P2FC commissioned studies to understand the consequences of oil sands companies' water withdrawals on river navigability, but these studies concluded that river navigability was insignificantly impacted by the water withdrawal rules being evaluated during Phase 2 (Ohlson et al., 2010). Indigenous P2FC members contended that the river navigability studies were flawed because they failed to consider areas along the Lower Athabasca River that Indigenous river users knew to have poor navigability during low flows (Ohlson et al., 2010). The P2FC, which was working to a firm deadline of December 2009, had insufficient time to undertake additional river navigability studies that incorporated Traditional Knowledge. Consequently, the P2FC categorized river navigability in support of Indigenous rivers uses as a knowledge gap that required further study (Ohlson et al., 2010).

Despite not reaching consensus, the P2FC was able to provide recommendations to the GoA and DFO to inform their development of a revised surface water quantity policy, which were summarized in the Phase 2 Framework Committee Report (P2FC Report). As mentioned,

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[37] Suncor and Syncrude voluntarily reduced their peak instantaneous water withdrawals from the Lower Athabasca River to 2.0 m^3/s each during Phase 2 (Ohlson et al., 2010).

the P2FC agreed to a set of principles on which water withdrawal rules should be set and were able to use those principles to devise and evaluate a range of alternative water withdrawal rules. Based on that work, the P2FC was able to narrow down the water withdrawal rule sets to the option that was most preferred amongst the members and recommend it as the starting point for Phase 3 (Ohlson et al., 2010). The P2FC also described the range of perspectives on the application of a base flow as a cut-off threshold and related exemptions for existing mines, recommending that the GoA and DFO investigate the legal and policy options for incorporating a base flow into the water withdrawal rules (Ohlson et al., 2010). To help ensure the water withdrawal rules could be implemented, specific voluntary (e.g., development of an industry water management agreement), policy (e.g., declaration of water conservation objectives), and operational (e.g., construction of water storage facilitates at existing mines) actions were also recommended (Ohlson et al., 2010). The P2FC also explicitly acknowledged areas of technical uncertainty for which monitoring programs should be developed so that the water withdrawal rules could be refined over time as more knowledge was gained (Ohlson et al., 2010). River navigability in support of Indigenous river uses was one component of the recommended monitoring program. With the release of the P2FC Report and its constituent recommendations on February 1, 2010, Phase 2 had come to an end.

4.2.3 Phase 3: Release of the Surface Water Quantity Management Framework for the Lower Athabasca River

4.2.3.1 Overview and Timeline

After the release of the P2FC Report, surface water quantity policy development entered its final phase led by the GoA and DFO (Figure 4.1). Initially, Phase 3 was to last approximately one year until the SWQMFLAR was released, but the timeline was extended to accommodate regional land use planning under the 2008 *Land-use Framework*. To the GoA, land use planning was "about better managing [Alberta's] growth, not stopping it" because Albertans value the environmental and social benefits of ecosystems in addition to the economic benefits from using natural resources (Alberta Environment and Parks, 2016, n.p.). Seven regions were identified for which land use plans were to be developed so that established so that regional land-use objectives could be established, regional environmental and natural resource management

policies could be integrated, and a cumulative effects management approach could replace project-by-project approvals (GoA, 2008a). Land use planning for the Lower Athabasca region was initiated in December 2008, shortly after the P2FC was convened. The P2FC was aware of the regional land use planning and recommended that the surface water quantity policy for the Lower Athabasca River be incorporated into the regional land use plan titled *Lower Athabasca Regional Plan* (Ohlson et al., 2010). The GoA, in line with the P2FC's recommendation, decided to delay development of the SWQMFLAR so that the *Lower Athabasca Regional Plan* could be finalized and approved by Cabinet.

In the *Lower Athabasca Regional Plan*[38], the GoA formally committed to developing the SWQMFLAR as one of its constituent frameworks that were to operationalize the cumulative effects approach to regional land use planning (GoA, 2012). Frameworks under the *Lower Athabasca Regional Plan* were to confirm and further specify regional land-use planning objectives; establish environmental or natural resource use limits to prevent unacceptable impacts to air, water, and biodiversity; and identify triggers that prompt assessment and action when specified environmental conditions or trends are observed (GoA, 2012). The weekly flow triggers and cumulative water withdrawal limits incorporated into the SWQMFLAR were heavily influenced by the P2FC Report and together prescribe the cumulative rate at which the surface mineable oil sands industry can withdraw freshwater from the Lower Athabasca River based on the status of real time river flows (GoA, 2015). Cumulative water withdrawal limits vary seasonally and are described by the GoA as becoming more restrictive as river flows decrease (GoA, 2015). Carver (2014) contests the GoA's assertion because the percentage of the river flows that can be withdrawn increases as flow declines in the critical lowest flows. As the percentage of river flows that can be withdrawn increases, the flow protections decrease (Carver, 2014).[39] Adaptive management triggers were also incorporated into the SWQMFLAR and

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[38] The *Lower Athabasca Regional Plan* took effect on September 1, 2012 after receiving Cabinet approval.
[39] In addition to concerns raised about the triggers and limits in the SWQMFLAR, six Indigenous groups, including MCFN and ACFN, raised concerns that the vision and purpose of the *Lower Athabasca Regional Plan* were not achieved because Indigenous peoples' "interests were not incorporated into the *Lower Athabasca Regional Plan* in any meaningful way" (*Lower Athabasca Regional Plan* Review Panel, 2015, p. 5). Acting on their concerns, the six Indigenous groups applied for a review of the *Lower Athabasca Regional Plan* under section 19.2 of the *Alberta Land Stewardship Act*. The *Lower Athabasca Regional Plan* Review Panel found that (i) the traditional territories of the Indigenous applicants were being encroached upon and reduced by industrial development; (ii) for the *Lower Athabasca Regional Plan* to achieve its vision and purpose, a more equitable balance between industrial activity

represent river flow conditions and water usage levels close to or outside of those used as modelling parameters to set the water withdrawal limits. Adaptive management triggers prompt discretionary responses led by the GoA to investigate the observed trend or condition and assess whether actions should be undertaken to modify the weekly management triggers or water withdrawal limits (GoA, 2015). Collectively, the triggers and limits within the SWQMFLAR were meant to ensure that "[c]umulative water withdrawals will be managed to support human and ecosystem needs, considering an acceptable balance between social, environmental, and economic interests" (GoA, 2015, p. 23).

Almost 15 years passed between the time that CEMA was convened and the GoA, in cooperation with DFO, released the SWQMFLAR. Government Participants described the process as a period of intensive learning about the complexity of establishing instream flow needs of rivers and how to collaborate in freshwater governance arenas consisting of diverse and cross-cultural perspectives:

> we didn't realize how complicated it would be and it took us a while to accept it, but we worked hard. We did the studies needed to understand the ecosystem and that took a while because there wasn't much information available at the start…People learned how to challenge each other and answer hard questions without getting defensive and we had to make difficult decisions that sometimes preferred one objective over another. We owe it to [the facilitators from Compass Resource Management] (Government Participant 2).

As described by Government Participant 2, difficult decisions were made throughout policy development to address technical and governance complexities. The difficult decisions during finalization of the SWQMFLAR included the following:

- To narrow the geographic scope to that portion of the Lower Athabasca River mainstem located just downstream of Grand Rapids to the start of the Athabasca River Delta due to the scientific uncertainty about the impacts of water withdrawals on flows in the delta.

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and constitutionally-protected rights of the Indigenous peoples must be found; and (iii) a Traditional Land Use Management Framework should accompany the *Lower Athabasca Regional Plan* to sustain Indigenous land uses. Many of the complaints that MCFN and ACFN expressed about the *Lower Athabasca Regional Plan* that led to the Review Panel's findings were like those they raised about the SWQMFLAR. This is perhaps unsurprising given that the SWQMFLAR was prepared as a *Lower Athabasca Regional Plan* framework.

- To not formally establish the water conservation objectives as defined in the *Water Act*[40] and recommended by the P2FC.

- To exclude a base flow that required cessation of all water withdrawals for the protection of fisheries because changing senior licenses outside of emergencies was deemed in appropriate.[41]

- To base water withdrawal rules on ecological objectives while monitoring river navigability.

Different perspectives exist on the appropriateness of each of the above decisions. For example, DFO's Canadian Science Advisory Secretariat concluded that a base flow below which water withdrawals would be prohibited should be incorporated into the water withdrawal rules using a precautionary approach (Canadian Science Advisory Secretariat, 2010). MCFN and ACFN agreed with the GoA that additional studies were needed to understand the impacts of water withdrawals on the flows in the delta, but they also supported the application of a cut-off flow below which water withdrawals should cease to protect fish and river navigability. To MCFN and ACFN, a cut-off flow threshold to protect river navigability for Indigenous river uses should have been included in the SWQMFLAR because Indigenous peoples had asserted its importance for most of the 15 years that surface water quantity policy was discussed.

4.2.3.2 *Incorporating the Aboriginal Navigation Flows into the Policy Process*

MCFN and ACFN, close observers of the P2FC, were aware of the contentious traditional land use studies completed during Phase 2 that led to river navigability being categorized as a knowledge gap. In response to the need for additional information about Indigenous river navigability and the tight timeline initially set for SWQMFLAR development by the GoA, MCFN and ACFN initiated their own reviews of the P2FC Report and studies of Indigenous uses

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[40] Water Conservation Objectives under subsection 1(hhh) of Alberta's *Water Act* are the amounts and quality of water needed to protect water bodies; aquatic environments; water uses related to recreation, transportation, tourism; or management of fish and wildlife. The setting of water conservation objectives is discretionary.

[41] Under the SWQMFLAR water withdrawal rules, Suncor and Syncrude, the senior licensees, can each withdraw up to 2 m³/s of water from the Lower Athabasca River all year, and the Muskeg River and Horizon projects can each withdraw up to 0.2 m³/s of water from the Lower Athabasca River all year for freeze protections.

of the Athabasca River waterscape in early 2010.[42] MCFN's and ACFN's goal was to provide

the GOA and DFO with an implementable policy solution to protect river navigability that was

grounded in evidence:

> The primary goal was to provide an evidence-based, written submission designed to
> effectively inform consultation with the Crown regarding plans for managing industrial
> water withdrawals from the lower Athabasca River. The Study addresses knowledge of the
> Athabasca River, use of the Athabasca River by community members, and possible effects
> of river change on the practice of treaty and aboriginal rights by ACFN and MCFN
> members (Candler et al., 2010, p. 10).

The written submission referred to in the preceding quote was the *As Long as the Rivers Flow*

Report prepared by the Firelight Group Research Cooperative in the spring of 2010, and it

documented MCFN's and ACFN's experiences exercising their constitutionally protected rights

within the context of changing flows within the Lower Athabasca River. Water quality and

quantity issues were addressed, with the understanding that the impacts on river navigability for

the purposes of transportation (travel between locations) and subsistence (hunting, trapping,

fishing) were of primary importance. River navigability encompassed the MCFN's and ACFN's

ability to navigate the main channel of the Lower Athabasca River and access areas along the

river, including banks and tributaries, that are important for traditional-use purposes. To MCFN

and ACFN, the *As Long as the Rivers Flow Report* filled the knowledge gap around river

navigability reported by the P2FC.

The *As Long as the Rivers Flow Report*, informed by knowledge held by male Elders and

river users, revealed that the Lower Athabasca River, tributaries, and delta historically played

and continues to play vital roles in the lives of MCFN and ACFN citizens:

> The Athabasca River occupies a central role in the culture and economy of the [A]boriginal
> peoples of the Fort Chipewyan area, and [are] critical to the ability of the ACFN and
> MCFN to hunt, trap, fish, and otherwise practice their [A]boriginal and treaty rights in a
> preferred manner" (Candler et al., 2010, p. 11).

Specifically, the study found that boating is MCFN's and ACFN's preferred and often only mode

of travel through their territories; boats with outboard motors are generally the preferred

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[42] These efforts were supported by a 2010 consultation plan that provided funding from the Alberta Government and
DFO towards MCFN's and ACFN's participation in policy development (see Nicholls, 2014).

watercraft; and that MCFN and ACFN citizens are experiencing a changed waterscape that is impacting how they use their territories (Table 4.1).

Table 4.1: Rationales for key findings in the *As Long as the Rivers Flow Report* (compiled from Candler et al., 2010)

Rationales for key findings		
Preferred means of travel is boating	Preferred watercraft is a boat with an outboard motor	Waterscape changes that MCFN and ACFN citizens are experienced
• it allows access deep into their territories and to locales away from industrial disturbances • without road access, boating is the only means of accessing hunting and fishing grounds, seasonal camps, Indian Reserves, and other critical areas within their territories • the Lower Athabasca River mainstem and tributaries are important transportation corridors between communities located upstream (Fort McKay and Fort McMurray) and downstream (Fort Smith) of Fort Chipewyan. • it facilitates other socio-cultural practices such as teaching	• lower costs to maintain • ease of repair • suitability for the waterscape conditions encountered in MCFN's and ACFN's territories	• frequency of spring flooding has reduced in one life time • over one life time, flows in the Athabasca River have declined • the changing hydrological conditions has impacted vegetation and furbearer populations • navigability of the Lower Athabasca River, its tributaries, and deltaic distributaries has become more difficult as water flows decline, limiting access to territories critical for exercising Aboriginal and treaty rights • as navigability of the waterways becomes degraded, travel has become unsafe (boating accidents) and more expensive (damaged equipment, longer travel times) • the quality of water in the Lower Athabasca River, its tributaries, and deltaic distributaries has degraded over one life time, causing the quality of berries, meat, fur, and the sacred and spiritual qualities of the waterscape to degrade

As part of their submissions in the *As Long as the Rivers Flow Report*, MCFN and ACFN introduced "bookend" river flows as their policy solution to improve and maintain the navigability of the Lower Athabasca River in ways that are meaningful to their citizens (Candler et al., 2010). The "bookend" river flows included the Aboriginal Base Flow (ABF) and the Aboriginal Extreme Flow (AXF). The ABF, calculated to be 1600 m^3/s, is defined as flows within the Lower Athabasca River that support full exercise of MCFN's and ACFN's Aboriginal and treaty rights on the river's mainstem, tributaries, and delta distributaries. The AXF, calculated to be 400 m^3/s, represented the low flows in the Lower Athabasca River that cause widespread and extreme disruption to the First Nations' ability to exercise their Aboriginal and treaty rights. Together, the two threshold flows expressed MCFN's and ACFN's perspectives on

the relationship between river flows, river navigability, territorial access, and exercise of Aboriginal and treaty rights (Candler et al., 2010). MCFN and ACFN invited the GoA and federal government to work with them on refining the ABF and AXF values (Candler et al., 2010).

The GoA and DFO received the *As Long as the Rivers Flow Report*, including the ABF and AXF, prior to developing the first draft of the SWQMFLAR in 2013, but to MCFN and ACFN their submissions were not meaningfully incorporated into the draft policy. The GoA and DFO did not act on MCFN's and ACFN's invitation to jointly refine the thresholds and the 2013 draft of the SWQMFLAR did not contain any provisions about river navigability other than a commitment to undertake further research. In response, MCFN and ACFN retained Aqua Environmental Associates (Carver, 2014) to undertake a technical assessment of the draft SWQMFLAR to understand how the proposed water withdrawal rules impacted their river uses. Aqua Environmental Associates, critical of the 2013 draft SWQMFLAR, made two recommendations as to how the *As Long as the Rivers Flow Report* should be implemented in the SWQMFLAR (Carver, 2014):

1. Impose the AXF as a short-term water management trigger for the spring and fall seasons that would require the cessation of all surface mineable oil sands water withdrawals when river flows in the mainstem fell below 400 m^3/s (Carver, 2014). Further research into delta hydrology should then be undertaken to refine the AXF so that it sustained the navigability of the delta distributaries in addition to the mainstem (Carver, 2014).

2. Include a long-term trigger called the Index of Aboriginal Navigation to allow for monitoring and adaptive management of river flow conditions necessary to sustain Indigenous river navigability under changing climatic and socio-economic conditions (Carver, 2014). The IAN, derived using the ABF and AXF, represented how river navigability for Indigenous purposes changed under different flow conditions. As flows increased from the AXF to the ABF, river navigability improved from impossible (0%) to unlimited (100%), meaning that the Index of Aboriginal Navigation would provide a quantified rating of river navigability for specific Lower Athabasca River flows (Carver, 2014). The ratings in turn could indicate thresholds that would trigger water

management actions to prevent further deterioration of Indigenous river navigability (Carver, 2014). In short, through the Index of Aboriginal Navigation, river navigability could be tracked in a standardized and quantified way for use in future refinements of the water withdrawal rules (Carver, 2014).

Collectively, the terms ABF, AXF, Index of Aboriginal Navigation, and river navigability ratings described in items 1 and 2 above are referred to as ANF in this research. MCFN and ACFN hoped that the technical reviews, explanations, and refinements of ANF provided by Aqua Environmental Associates would be more impactful on SWQMFLAR development.

In July 2014, the GoA released a second draft SWQMFLAR for public review and consultation with Indigenous peoples that was somewhat more responsive to Indigenous river navigability needs than the first SWQMFLAR draft. The second draft validated MCFN's and ACFN's river navigability concerns by acknowledging that the ABF and AXF aligned with modelling and bathymetric data for the Lower Athabasca River and that the oil sands water withdrawals could potentially impact river navigability. Further, the second draft SWQMFLAR acknowledged the existence of pinch points where navigability was particularly susceptible to low flows. Collectively, the acknowledgements related to river navigability suggested that MCFN's and ACFN's concerns were heard by the GoA.

Despite being featured in the second draft SWQMFLAR, MCFN and ACFN continued to be frustrated by the SWQMFLAR's constituent river navigability protections. Most importantly to MCFN and ACFN, a cut-off threshold for all surface mineable oil sands water withdrawals from the Lower Athabasca River such as the AXF continued to be excluded from the water withdrawal rules. To MCFN and ACFN, the lack of a cut-off threshold signaled that the GoA prioritized oil sands water rights over treaty rights. Further, MCFN and ACFN considered the river navigability monitoring provisions included in the second draft to be problematic for two reasons. First, the GoA unilaterally modified the Index of Aboriginal Navigation proposed by Aqua Associates on behalf of MCFN and ACFN to create a new monitoring index termed the preliminary Aboriginal Navigation Index and that was based on the GoA's recalculation of the AXF from 400 m^3/s to 300 m^3/s. To MCFN and ACFN, their lack of involvement in the AXF recalculation was disrespectful and rendered the Aboriginal Navigation Index arbitrary. Second, the fall season Aboriginal Navigation Index would need to change by 10% before the GoA would investigate the causes of deteriorating navigability, let alone take action to prevent further

deterioration in navigability (Carver, 2014). To MCFN and ACFN, the 10% change in threshold meant that their citizens would be subjected to degraded river navigability with little certainty that corrective action would take place (Carver, 2014). MCFN and ACFN shared their concerns in writing with the GoA, asserting that the lack of a cut-off threshold and disrespectful monitoring provisions diminished the GoA's acknowledgment of the importance of Indigenous river navigability in surface water quantity policy development (Carver, 2014).

Exchanges of technical information between MCFN and ACFN and federal and provincial governments were important components in their engagement on Indigenous river navigability and the draft SWQMFLAR, but the written submissions were supported by other forms of communication. Representatives from the GoA, Alberta Energy Regulator, and DFO held formal meetings and communicated informally (e.g., telephone calls, electronic mail) with MCFN and ACFN leaders and their supporting scientists that helped clarify their respective interests and positions. MCFN and ACFN held discussions with Transport Canada on navigability of the Lower Athabasca River, prompting the initiation of federal government-led river navigability studies; however, the studies were not completed prior to the release of the final SWQMFLAR and Transport Canada did not participate in the drafting of the SWQMFLAR. MCFN and ACFN also continued to refine their positions internally through their community-based monitoring programs as they reviewed and assessed the 2013 and 2014 drafts of the proposed SWQMFLAR issued by the GoA and DFO. Through the different communication pathways, MCFN and ACFN were able to promote ANF as a surface water quantity policy solution and state governments were able to better understand the First Nations' proposals. However, the communications pathways opened between MCFN and ACFN and state governments were more about information exchange rather than collaboration to refine ANF in mutually acceptable ways for inclusion in the SWQMFLAR.

4.2.3.3 *Policy Prescriptions Pertaining to River Navigability*

In March 2015, the GoA released the final SWQMFLAR which updated and replaced the Phase 1 Framework (Figure 4.1). Reporting that water withdrawals by the surface minable oil sands in 2015 had relatively small impacts on flows in the Lower Athabasca River, the GoA also acknowledged that there are risks to MCFN's and ACFN's continued ability to access their hunting and fishing grounds during the fall. The fall river navigability index has declined since

1958 and forecasted full-build out oil sands water withdrawals would "significantly reduce Fall season navigability of the Athabasca River in low flow years even before considering changes due to climate change" (GoA, 2015, p. 76). The risks to river navigability during the fall hunting season were used in the SWQMFLAR as justification for the inclusion of river navigability monitoring provisions in the form of two adaptive management triggers:

1. The first trigger, *High Water Use During Low Summer/Fall Flows*, was unchanged from the second draft SWQMFLAR and commits that "[a] management response will be triggered if cumulative oil sands withdrawals exceed the predicted full build-out scenario (16 m^3/s) during any week in the Summer/Fall season (weeks 24 to 43) in which the average weekly flow is less than 400 m^3/s" (GoA, 2015, p. 35). While this adaptive management trigger uses MCFN's and ACFN's AXF of 400 m^3/s, investigations into whether river navigability has been impacted by water withdrawals will only occur if total water withdrawals exceed the full build out scenario. In practice this means that Indigenous river navigability issues may persist while studies are completed, and potential Indigenous river navigability issues caused by water withdrawals below the full build out scenario will not be investigated.

2. The second trigger, *Preliminary Aboriginal Navigation Index*, commits that "[a] management response [will] be initiated if the change in fall season (weeks 34 to 43) Aboriginal Navigation Index were to exceed 10% in any year" (GoA, 2015, p. 39). The management response for this trigger is an assessment of the factors that may be contributing to declining navigability including natural factors (e.g., hydrological cycles), climate change, oil sands water withdrawals, and water consumption upstream of the surface mineable oil sands developments. While the wording of this trigger changed slightly from the second draft SWQMFLAR (10% change in any year instead of on average over time), it continues to use the GoA's calculation of the AXF (300 m^3/s) instead of the AXF calculated by MCFN and ACFN (400 m^3/s). MCFN and ACFN will experience reduced navigability.

Neither adaptive management trigger provides protection for river navigability during the spring hunting season or for the navigability of culturally important tributaries such as the Firebag River. MCFN and ACFN continue to be frustrated with the river navigability protections in the SWQMFLAR which they perceive as favouring industrial development over their Aboriginal

and treaty rights. The First Nations want the SWQMFLAR to be changed so that their preferred river uses may continue as the oil sands mining industry grows and climate change affects river hydrology. Conversely, the GoA is proud of its efforts to incorporate MCFN's and ACFN's knowledge and river uses into surface water quantity policy for a biophysically complex and economically critical river.

CHAPTER 5 – RESULTS FOR RESEARCH QUESTION 1: UNDERSTANDING THE SIGNIFICANCE OF THE ABORIGINAL NAVIGATION FLOWS

5.0 Introduction

Chapter Five presents the findings for Research Question 1: Why are ANF significant to the Indigenous communities that helped develop them? Research Question 1 contributed to the fulfillment of the third ESF dimension consisting of exploration of the perspectives, biases, assumption, attitudes, norms, and practices of peoples engaging with each other. In this thesis, the perspectives of Community Participants, including MCFN, ACFN, and FCM citizens and their professional associates (e.g., consultants), were gathered to understand why river navigability is important to the Indigenous peoples of the Peace-Athabasca Delta (Research Question 1a) and why the ANF were developed (Research Question 1b). The importance of river navigability is presented first because it is an element of the rationale for ANF development, which together are the constructivist grounded theories constituting the significance of the ANF to MCFN, ACFN, and FCM.

Before presenting the findings, commentary on the use of italicized text below is needed. The italicized phrases correspond to the labels presented in the figures depicting the constructivist grounded theories for the importance of river navigability (see section 5.1) and why the ANF were developed (see section 5.2).

5.1 Navigating for Wellness: Understanding the Importance of River Navigability and Boating to MCFN, ACFN, and the FCM

In cafes, on sidewalks, at the fuel pump, and at the health centre, I heard the people of Fort Chipewyan talking about their recent boating experiences. People shared information about freshwater levels, sand bars, willows, the cost of gas, who was heading out to what parts of the waterscape, who shot a moose and where, and the condition of their boats and motors. Ubiquitous conversations about boating reflect the critical role that it plays in the daily lives of MCFN, ACFN, and FCM. As explained by Community Participant 2 "being out there, being on our boats is in our hearts". Community Participant 13 added that individuals who are no longer

active boaters continue to connect with other people and the waterscape through conversations about boating: "some people don't go out any more like some of the Elders stay at home, but they are happy hearing stories and seeing the young people go out". But why are people happy when they hear stories about boating? Why is boating an integral part of individual and community life in Fort Chipewyan? Community Participant 13 provided a succinct but informative answer to these questions: "It makes us healthy". Although terms such as health and healthy were used by the Community Participants, the terms wellness and well are used in the thesis to capture the intersecting notions of river navigability, health, identity, vulnerability to change, and treaty rights that were expressed during data collection. Wellness in this case, then, refers to the individual and collective conditions of the citizens of MCFN, ACFN, and FCM that are enabled by boating. In turn, boating capabilities are in part dependent on the navigability of waterways.

Community Participants shared their perspectives on the importance of river navigability, framing them positively and negatively. The positive framing, termed *buoying wellness through superior river navigability*, describes how superior river navigability provides the boating opportunities needed for the citizens of MCFN, ACFN, and FCM to be well. Figure 5.1 visually depicts the positive framing (Roman numeral I in Figure 5.1), including its constituent categories of *symbiotically caring through boating*, *continuing across change preferentially*, and *exercising treaty rights*. The negative framing, termed *running wellness aground through poor river navigability*, described the impacts to wellness caused by poor river navigability that limits boating opportunities. Figure 5.2 visually depicts the negative framing (Roman numeral I in Figure 5.2), including its constituent categories of *outsider uncaring eroding insider kinship*, *uncertainly continuing across change*, and *constraining the exercise of treaty rights*. Both framings are presented here to respect how Community Participants shared their perspectives with me and because there are differences between the framings.

Section 5.1 is organized into three sections based on the visual depictions of the positive (*buoying wellness through superior river navigability;* Figure 5.1) and negative (*running wellness around through poor river navigability*; Figure 5.2) framings of the importance of river navigability. First, section 5.1.1 explains the categories that differ between the positive and negative framings. Specifically, s*ymbiotically caring through boating* from the positive framing (Roman numeral II in Figure 5.1) is first explained followed by its counterpart in the negative

framing, *outsider uncaring eroding insider kinship* (Roman numeral II in Figure 5.2). Second, section 5.1.2 explains the categories that converge in the positive and negative framings, including *continuing across change* (Roman numeral III in Figures 5.1 and 5.2) and *(dis)honouring treaty rights* (Roman numeral IV in Figures 5.1 and 5.2). Third, the broader environmental and social contexts in which Community Participants placed the information that they shared for the negative framing is described in section 5.1.3 (Roman numeral V in Figure 5.2).
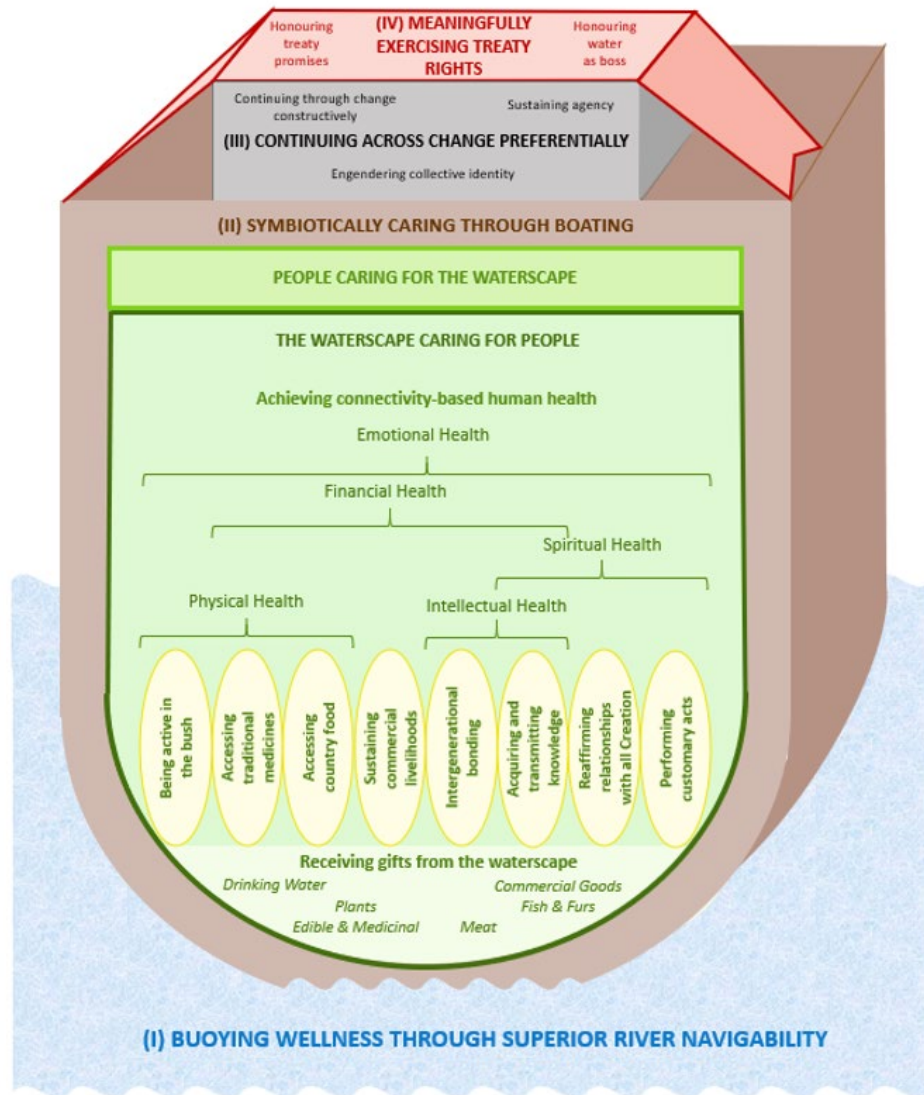
The positive framing of the importance of river navigability to Community Participants is titled **(I) Buoying wellness through superior river navigability.** When the Lower Athabasca River and its tributaries and distributaries are highly navigable using the Community Participants' preferred boating equipment, **(II) symbiotic** caring between the waterscape and people is enabled. People here refers to citizens of MCFN, ACFN, and FCM. The waterscape cares for people by providing them with gifts such as meat, medicines, and drinking water. The boating-dependent activities to obtain the waterscape's gifts shown in the yellow circles were how five dimensions of human health were achieved. Human health was considered connectivity-based because it depends on strong connections between people and between people and the waterscape that were maintained by boating. People in turn cared for the waterscape by following the unspoken laws for respecting the land, including ceremonies and acts of gratitude (e.g., offering tobacco). Community Participants acknowledged that change was part of life, and they may **(III)** continue across that change in their preferred ways when symbiotic caring engenders a strong collective identity and, in turn, the agency to determine how their people should respond to that change. Since symbiotic caring, an element of the people's identity, was enabled by superior river navigability and the boating it supports, river navigability and boating were also agents of identity, agency, and the people's ability to continue through change constructively. When Community Participants can continue through change preferentially, they consider themselves to be collectively well. Securing their collective wellness was, to Community Participants, dependent on their ability to meaningfully exercise their treaty rights **(IV)**. Meaningfully exercising their treaty rights included what Community Participants described as the ancillary right to boating to access their territories because of how vital it was to their ability to hunt, trap, and fish. Hence, river navigability enables the ancillary rights through which collective wellness is achieved.

Figure 5.1: Positive framing of the importance of Indigenous river navigability

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(IV) CONSTRAINING THE EXERCISE OF TREATY RIGHTS

Dishonouring treaty promises

Dishonouring water as boss

Being vulnerable to change   Declining agency

(III) Uncertainly continuing across change

Eroding collective identity

(II) OUTSIDER UNCARING ERODING INSIDER KINSHIP

Disrupting community-based kinship

Losing our languages

Disabling waterscape-based livelihoods

Eroding food-sharing networks

Disconnecting from geographically distant loved ones

Eroding knowledge sharing pathways

Constraining access to loved ones

Constraining access to harvesting grounds

Lengthening travel routes

Constraining access to commercial centres

Boating accidents: damaging equipment

Boating accidents: injuring people

Constraining access to cultural sites

Struggling with routine boating activities

Outsiders' uncaring

(I) RUNNING WELLNESS AGROUND THROUGH POOR RIVER NAVIGABILITY

(V) Nature's looks, sounds, smells, tastes, and how it works have changed

Legacy social problems from Canada's colonial history

The negative framing of the importance of river navigability and boating is titled **(I) Running wellness aground through poor river navigability.** To Community Participants, poor river navigability signaled federal and provincial governments' uncaring stance towards the people of the Peace-Athabasca Delta. When navigability of the Lower Athabasca River and its tributaries and distributaries is poor, **(II)** kinship erodes because the boating-dependent activities that foster the kinship become struggles. Kinship was the network of relationships creating a sense of closeness and belonging within and between MCFN, ACFN, and FCM citizenries due to their shared geography, histories, and relationships with the waterscape. According to Community Participants, change was as a part of life but continuing through that change was uncertain **(III)** because erosion of kinship was weakening the collective identities of MCFN, ACFN, and FCM and, in turn, their agency to determine how they should respond to that change. Uncertainly continuing across change meant, to Community Participants, that they were collectively unwell. To Community Participants, their wellness was not achieved because they were constrained in how they exercised their treaty rights **(IV)**. Community Participants explained that they considered boating to access their territories to be an ancillary right because of how vital it was to the exercise of their treaty rights to hunt, trap, and fish, but poor river navigability was eroding their ability to boat, and hence, their ability to exercise their treaty rights. Community Participants placed their navigability challenges within their broader social and environmental contexts, acknowledging that degraded ecosystem health and the social legacies of Canada's colonial history have also impacted how the Athabasca River is used **(V)** (attributions for graphics are provided in the References section).

Figure 5.2: Negative framing of the importance of Indigenous river navigability

5.1.1 Divergence in the Positive and Negative Framings of the Importance of River Navigability

The categories about caring that differ between the positive and negative framings of the importance of river navigability are presented below. S*ymbiotically caring through boating* from the positive framing (Roman numeral II in Figure 5.1; Section 5.1.1.1) is first explained followed by its counterpart in the negative framing, *outsider uncaring eroding insider kinship* (Roman numeral II in Figure 5.2; Section 5.1.1.2).

5.1.1.1   Positive Framing of Buoying Wellness: Symbiotically Caring through Boating

Symbiotically caring through boating (Roman number II in Figure 5.1) within the positive framing of *buoying wellness through superior river navigability* represents how superior river navigability enables boating and boating enables a mutually caring relationship between the Indigenous peoples of the Peace-Athabasca Delta and their waterscape. The intimate interdependency between people and the waterscape was explained succinctly by Community Participant 18 who said that "the Athabasca River is [their] life". *Symbiotically caring through boating* consists of two processes, including *the waterscape caring for people* and *people caring for the waterscape* that are explained below.

The Waterscape Caring for People: *The waterscape caring for people* describes how Community Participants' health was achieved by participating in boating-dependent activities that sustained their connection to the waterscape (*achieving connectivity-based human health*), which in turn enabled the receipt of gifts from the waterscape on which Community Participants' lives depend (*receiving gifts from the waterscape*). The processes constituting the concept of *the waterscape caring for people*, including *receiving gifts from the waterscape* and *achieving connectivity-based human health* are expanded on below.

Receiving Gifts from the Waterscape: Community Participants described how the waterscape is a provider of "gifts" (Community Participant 17). Gifts are "everything that [the people] need" to live (Community Participant 4), including freshwater, meat, edible plants, fish and furs for commercial purposes, and medicinal plants as identified in the following quotes:

When the water is good, everything is good. We get moose and muskrat and ducks, beavers are still in the river…All the animals are good, even the little black beetles that we can see on the snow… berries, big fat ones the size of the end of my thumb that maybe one day we will see again when the water is good. (Community Participant 30)

I'm not saying we don't need pills, my husband takes pills for his heart, but we need our medicines too and we need water for them to grow and pick them…I need to go [by boat] to other places too like those creeks across the bay [to pick them]. (Community Participant 19)

The quotes from Community Participants 19 and 30 above also establish a dependent relationship between the waterscape's provision of material gifts and boating. Community Participants explained that they are unable to access the gifts provided by the waterscape without boating capabilities because of the lack of roads in their territories. Since the waterscape cares for people by providing them with gifts and those gifts are primarily accessed by boats, boating helps enable the waterscape's care for people. Hence, when river navigability is superior, Community Participants were better able to receive the gifts given to them by the waterscape.

Achieving connectivity-based human health: River navigability determines the extent and timing of boating in the Lower Athabasca River region because boats require a certain depth of water to be operated safely (Community Participants 2, 4, 6, 8, 11, 12, 13, 14, 15, 16, 17, 19, 22, 23, 24, 29, 30). When the depth of river flows in the Lower Athabasca River region supports the safe operation of boats, boating enables eight activities that nurture connectivity between people and between people and the waterscape. The eight connectivity-nurturing activities include the following:

1. *Being active in the bush*[43]: Participating in outdoor activities such as cabin building, hunting, and plant gathering.

2. *Accessing traditional medicines*: The acts of locating, preparing, and consuming traditional plant-based medicines collected from the waterscape.

3. *Accessing country foods*: The acts of locating, harvesting, preparing, and consuming wild meat (e.g., ducks, moose, muskrat) and edible plants growing in the waterscape.

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[43] Phrases such as "in the bush" and "on the land" were used by Community Participants to refer to natural places within their territories beyond the borders of their towns.

4. *Sustaining commercial livelihoods*: "[M]aking a living on the land" (Community Participant 30) by hunting, trapping, and fishing for commercial purposes.

5. *Acquiring and transmitting knowledge*: Community Participants described knowledge as consisting of "unspoken laws" about respectful use of the waterscape (Community Participants 14, 17, 26), ceremonial knowledge, technical skills (e.g., fixing boat motors, setting traps, cooking game meat), and "having a sixth sense about the land because [we] know the land" (Community Participant 17). Knowing the land was being able to understand weather patterns; the shape of the land; the behaviours, needs, and patterns of animals, insects, plants, and water; and the relationships between these environmental components considered to be living entities. Acquiring and transmitting that knowledge encompasses the teaching and learning that occurs between generations (e.g., Elder teaching youth skills) and within generations (e.g., adult boaters sharing recent observations of freshwater levels and moose locations in real time through texting and in-person conversations).

6. *Intergenerational bonding*: The building of relationships between people from different age groups that encourages a sense of belonging to the same community. Relationships grow stronger when people are active in the bush together.

7. *Reaffirming relationships with all Creation*: The Creator is the entity that brought into being all tangible, intangible, human, and non-human parts of the universe. All parts of the universe, or Creation, are interconnected, and people partly maintain their connections with other parts of Creation by spending time on the water "listening to it" (Community Participant 17).

8. *Performing customary acts*: Accessing sacred or other culturally important sites and materials needed for ceremonies is critical for honouring the interconnectedness of all things in the universe.

Community Participants explained that by participating in the eight boating-dependent activities that nurture connectivity between people and between people and the waterscape, human health is sustained in five dimensions. The five dimensions of connectivity-based human health derived from the Community Participants' knowledge are:

1. *Physical health*: The biomedical status of the human body that is maintained by participating in physically demanding outdoor activities; accessing meat and edible plants from the waterscape, which were considered more nutritious that store-bought food; and accessing traditional medicines from the waterscape that help heal physical ailments.

2. *Intellectual health*: The level of knowledge held by individuals about their waterscape-dependent way of life gained though knowledge sharing (acquisition and transmission) processes. Knowledge sharing is facilitated by intergenerational bonding as people are more likely to spend time together and learn from each other when they have a close relationship.

3. *Spiritual health*: The degree to which people are connected to the Creator and Creation. Spiritual health depends on (i) knowledge sharing about ceremonies and laws that connect people to their territories and the Creator; and (ii) access to sacred or other culturally important sites and materials needed for ceremonies and other customary acts that honour the interconnectedness of all tangible, intangible, human, and non-human parts of the universe.

4. *Financial health*: An individual's ability to pay for their basic needs and those of their loved ones. Financial health depends on access to traditional medicines to offset the costs of western medicine; access to country foods to lessen reliance on expensive store-bought food; and the ability to earn money through water-based livelihoods, including the sale of fish in Fort Chipewyan and furs on the market. These financial health factors are facilitated by intergenerational bonding and knowledge sharing processes that create learning opportunities for young people to gain the skills necessary to obtain goods for subsistence and commercial purposes.

5. *Emotional health*: How people feel inside themselves. The feelings that people experience are influenced by their biomedical status; ability to perform customary acts such as accessing traditional medicines and country foods and showing gratitude and respect through ceremony; ability participate in water-based livelihoods that provide their families with basic needs; connection with the Creator and their territories; and relationships they have with others that facilitate knowledge sharing and a sense of belonging.

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Since each of the five dimensions of human health are a function of different configurations of the eight boating-dependent activities, human health can be understood to be the condition of people partly engendered by river navigability. To Community Participants, when superior river navigability enabled them to engage in the eight boating-dependent activities throughout their territories, Community Participants achieved a greater degree of connectivity-based human health in five dimensions. Table 5.1 provides a definition for each of the five human health dimensions, including the processes on which the health dimensions are dependent, along with corresponding quotes connecting the findings to the data.

Table 5.1: Five dimensions of human health in the positive framing of buoying wellness through superior river navigability

Health Dimension	Definition	Contributing Processes	Quote
Physical	Biomedical status of the human body	Being active in the bush	Look at how tough [he] is, he's in his 80s and that is from going to his cabin and going trapping all the time (Community Participant 17)
		Accessing traditional medicines	Our medicines make us better when we are sick (Community Participant 19)
		Accessing country foods	When I taste muskrat from the pot, my stomach gets warm and it goes through my blood. I feel stronger…Food from the store doesn't do that (Community Participant 30).
Intellectual	Degree to which individuals "know the land…the unspoken laws…" (Community Participant 14) and have the skills to live off the land.	Acquiring and transmitting knowledge	I teach my kids about where to look for moose when we go in the boat and I tell them what my grandfather told me…they can feed themselves and teach their kids (Community Participant 6)
		Intergenerational bonding	Older people and young people need to spend time together to learn our ways (Community Participant 16)
Spiritual	"Spiritual health is being connected to the Creator" (Community Participant 24)	Acquiring and transmitting knowledge	Not everyone knows the unspoken laws, but the grassroots people do and the land is part of them…I was taught by my parents and I teach my children (Community Participant 14)
		Reaffirming relationships with the Creator and all Creation	Being on the land, listening to the land, that is how you connect with the Creator (Community Participant 24) Everything is connected, the people, the animals, the water, even that rock over there. Everything is connected (Community Participant 4)
		Performing customary acts	Our Elders taught us to give some tobacco when we go duck hunting to give thanks (Community Participant 13)
Financial	The ability to pay for basic needs that an individual and their family needs	Accessing traditional medicines	Getting water plants for medicines makes us healthy so we don't have to spend, buy expensive pills (Community Participant 19)
		Accessing country foods	Did you go in the store yet? You should go there and also look at the fuel pump. Everything costs a lot of money and food from the store is not healthy but if I shoot a moose that can feed my kids for a few months and sometimes I can give meat to the old people because they don't have much money…some people sell fish in town to make a few extra dollars that helps to pay for gas and motors…my uncle traps and makes some money but not like he used to when furs brought in more money but there was more water last year so the furs were better and he made a little more money (Community Participant 16) its expensive running boats. Cost of gas is high and its expensive to buy parts when it breaks
		Sustaining commercial livelihoods	

Health Dimension	Definition	Contributing Processes	Quote
			down but it is still better than the store (Community Participant 4)
		Acquiring and transmitting knowledge Intergenerational bonding	When I can take my sons and even my daughter out who is learning how to cook moose from her grandma, they won't have to go the store to buy everything…they share meat with the Elders who eat beef, they don't like the taste of beef but they have to eat it anyway because they can't shoot their own moose and it can cost $50 for a small piece of beef. Sharing doesn't get done as much as it used to because there are not as much moose, but we have to make sure our Elders are okay (Community Participant 6)
Emotional	"Emotional health is how people feel inside" (Community Participant 24)	Being active in the bush	I feel good at my cabin (Community Participant 14)
		Accessing traditional medicines	I can't describe what it feels like to see the plants there, I keep a bit in here to keep it close to me (Community Participant 19)
		Accessing country foods	It makes me feel good knowing that I can eat food from the land [because] it is part of me (Community Participant 29)
		Sustaining commercial livelihoods	People celebrated when the furs were good (Community Participant 10)
		Acquiring and transmitting knowledge	The young people enjoy hearing the Elders' stories (Community Participant 4)
		Intergenerational bonding	My son is so happy when I take him hunting and he has a big smile and that makes me happy spending time with him (Community Participant 6)
		Reaffirming relationships with all Creation Performing customary acts	My grandfather told me that everything has a life force. I learned about everything being made of atoms that have energy, maybe that is the life force my grandfather told me about, so we have to remember that everything is living…I don't know how to describe it but I feel good knowing that life force and we have to give thanks for that (Community Participant 17)

People Caring for the Waterscape: *People caring for the waterscape* represents the activities that the Community Participants engage in to ensure that the waterscape's health is sustained. Community Participants described caring for the waterscape through their "unspoken laws for giving respect to the land" (Community Participant 14) and ceremonies that "give thanks to the animals, the water, all Mother Nature" (Community Participant 16). As an outsider, I was not privy to specific details about the laws and ceremonies, but generally came to understand they govern the relationships between the Indigenous peoples of the Peace-Athabasca Delta and all

things in Creation, described by Community Participants as encompassing all things tangible, intangible, human, and non-human: "What does Creation mean? It's everything out there…all the animals, grasses, the air, the rocks, water, insects, birds…even their spirits, people too" (Community Participant 17). When river navigability is superior, Community participants described being able to "give thanks at the places where families go to be in the bush together" (Community Participant 29). In other words, superior river navigability enabled the Community Participants to access the materials needed to perform ceremonies at culturally important locations. As part of their relationship with freshwater centered around gratitude and respect, Community Participants described being driven to "fight for the water" (Community Participant 22) by advocating for its protection in state government-led freshwater governance arenas in Canada. Collectively, by showing respect and gratitude to Creation and advocating for freshwater protections, Community Participants were able to care for the waterscape.

5.1.1.2   *Negative Framing of Running Wellness Aground: Outsider Uncaring Eroding Insider Kinship*

Outsider uncaring eroding insider kinship (Roman numeral II in Figure 5.2) within the negative framing of *running wellness aground through poor river navigability* represents the breakdown in the social ties within and between the citizenries of MCFN, ACFN, and FCM that happens due to outsider uncaring. Community Participants explained that people, especially federal and provincial government representatives, from outside MCFN's, ACFN's, and FCM's citizenries (i.e. outsiders) were perceived as uncaring toward the people who depend on the Lower Athabasca River for their lives. To Community Participants, *outsiders' uncaring* was symbolized in part by poor river navigability and could be due to their *unintentional ignorance* or *willful ignorance* of the declining flows in the Lower Athabasca River. However, Community Participants considered the impacts of unintentional or willful ignorance on MCFN, ACFN, and FCM citizens, termed here as *struggling with routine boating activities* and *disrupting community-based kinship*, to be the same, both of which are expanded on next. Table 5.2 provides a definition for categories constituting *outsiders' uncaring* along with corresponding quotes connecting the findings to the data.

Table 5.2: Properties of Outsiders' Uncaring

Category	Definition	Quote
Outsider uncaring	Federal and provincial governments were perceived as not caring about the people who depend on the Lower Athabasca River for their lives due to the changes in river navigability that MCFN, ACFN, and FCM citizens experienced.	The changes in the water, animals, everything, show they [federal and provincial government representatives] don't care about us (Community Participant 6) the [Alberta] government don't believe us when we tell them about the water in the Athabasca…they think why should they care about what we say because we are a small native community (Community Participant 4).
Unintentional ignorance	Federal and provincial government representatives do not understand the changes in the waterscape because they do not observe them firsthand or think the health of the waterscape is changing rather than changed. When the health of the waterscape is perceived as changing, rather than changed, people believe there is still time to fix problems. However, to some community participants, the health of the waterscape has changed irrevocably, and federal and provincial governments need to take action now to prevent further decline in waterscape health.	They [federal and provincial government representatives] don't come to town, except maybe Parks [Canada], and see for themselves how much the water has gone down and so they don't know the problems that we have… If they don't know the problems, they won't take action (Community Participant 16) I heard them talk about the land changing, the water changing, the animals changing…but that is not right, because everything has changed, the change happened and delta is changed and the changes they can't come back so the land is not changing, it is changed but they don't understand that so they don't see a big problem so they don't think they have to fix it now (Community Participant 22)
Willful ignorance	Federal and provincial government, in some cases, are perceived as deliberately remaining unaware of the changes in the waterscape so that they do not have to change how they manage water use from the Lower Athabasca River.	If they choose to believe there is no water problem, then they don't have to do anything about it (Community Participant 4)

Struggling with routine boating activities: Community Participants described how poor river navigability was making boating activities that they carry out in their daily lives difficult. Since the waterways "are [their] roads" (Community Participants 4, 6, 13, 14, 16, 17, and 22), water transportation was vital to Community Participants. As river flows declined, Community Participants described how many of the waterways became impassable, making it difficult to use them for transportation purposes. Specifically, Community Participants described not being able to access places they routinely travel to by boat such as the homes of loved ones (*constraining access to loved ones*), cultural and harvesting sites (*constraining access to cultural sites*; *constraining access to harvesting sites*), or other commercial centres to buy material goods

(*constraining access to commercial centres*). Community Participants also described how declining river flows, even if they can access sites that are important to them, are indirectly constraining boating activities by *lengthening travel routes* and increasing the threat of boating accidents that damage equipment and injure people (*boating accidents: damaging equipment, injuring people*). The boating-related struggles that Community Participants described experiencing because of poor river navigability and how, to Community Participants, the struggles impacted social ties within and between MCFN, ACFN, and FCM citizenries are explained in the next section. Table 5.3 provides a definition for the categories about the struggles with routine boating activities experienced when river navigability is poor, along with corresponding quotes connecting the findings to the data.

Table 5.3: Struggles with routine boating activities because of poor river navigability

Category	Definition	Quote
Constraining access to loved ones	Not all MCFN, ACFN, and FCM citizens live in Fort Chipewyan. Some citizens live in other towns or at their cabins only accessible by boats. During low flows, people cannot visit their loved ones living in different towns or at their cabins, making it hard for them to stay close. Not being able to visit loved ones is especially hard when they are going through hard times.	We tried to visit my auntie's cabin but we couldn't get through, the water was only this deep…we won't get to see her now until she comes to town in a few weeks (Community Participant 6) Not everyone lives in Chip, people live in lots of places…My sister lives in McMurray but going there is dangerous now…[he] cut his head when he hit a sandbar…takes a long time to get there, lots of hours to get to McMurray (Community Participant 30) We can't help them if we can't visit them when they are sick or sad (Community Participant 14)
Constraining access to harvesting grounds	People rely on their boats to access their hunting, fishing, berry-picking, and medicinal plant harvesting sites, but low river flows make boat passage impossible in some areas.	Families used to go to in here to Jackfish, Richardson to fish every summer but we can't get in there anymore very much (Community Participant 4) So many places are blocked off now with sand and willows…we can't get into the side channels to hunt (Community Participant 14)
Lengthening travel routes	Some tributaries and distributaries have become impassable by boats during low flows, causing boaters to take longer routes to reach the same locations. The longer travel routes require more fuel and time, making it harder for people to keep using their boats.	burn a lot a fuel avoiding the shortcuts because it's closed off (Community Participant 10) I used to get there in an hour, but now it takes me all morning to go all way around instead of cutting through the channel (Community Participant 8)
Boating accidents: damaging equipment	During low flow periods, the likelihood of collisions with sandbars increases, causing boating equipment to be damaged. Since boat repairs are expensive and it can be difficult to have replacement parts shipped to Fort Chipewyan, many boats take a long time to be repaired, or are possibly never repaired.	[he] wrecked the leg running into the sandbar with probably a log stuck in it, and very expensive to fix (Community Participant 10). People don't have the money to fix their boats so they are just left in the yard (Community Participant 16)
Boating accidents: injuring people	During low flow periods, the likelihood of collisions with sandbars increases, causing personal injuries. A range of injuries were described, from bruises to large cuts requiring stitches and critical injuries. Fear of accidents is preventing some people from visiting some locations where flows are known to be low or from driving boats at all.	He came back in from hitting a sand bar and there was blood running down his face (Community Participant 18) People have almost died from running into sandbars in the river and now some people are scared to go out on the river (Community Participant 17)
Constraining access to cultural sites	Low flows have made it difficult to access sites that are important to family histories (e.g.,	[He] knows the land but even he can't get to his cabin where his family grew up (Community Participant 29)

Category	Definition	Quote
	family cabins) or areas where multiple families would camp and celebrate together.	People took their families to Birch River to camp together…sometimes there was drumming…but there are too many willows in the lake now to reach the river (Community Participant 14)

Disrupting community-based kinship: As explained by Community Participants, their struggles with carrying out routine boating activities (*struggling with routine boating activities*) disrupted community-based kinship (*disrupting community-based kinship*). Kinship was understood by Community Participants to be the network of relationships creating a sense of closeness and belonging within and between MCFN, ACFN, and FCM citizenries due to their shared geography, histories, and relationships with the waterscape:

> Chip's a small town and that has its problems but people look out for each other even if they are from different families. Even that guy who lives in that cabin there, he was not born in Fort Chip, he came here thirty or so years ago and spends all year at his cabin so he knows the water…people will listen to him and go check on him (Community Participant 17).

Kinship was disrupted through five impacts caused by the struggles that Community Participants described experiencing as a result of poor river navigability: (1) *disconnecting from geographically distant loved ones*, (2) *eroding food-sharing networks*, (3) *eroding knowledge sharing pathways, (4) disabling waterscape-based livelihoods*, and (5) *losing our languages*. The five impacts that disrupted community-based kinship are each explained below.

1. *Disconnecting from geographically distant loved ones*: Community Participants described how MCFN, ACFN, and FCM citizens consider Fort Chipewyan to be their home community, but that not all citizens live in Fort Chipewyan. Some citizens live in other towns or spend much of their time at their cabins only accessible by boats during the open water season. During low flows, Community Participants described not being able to visit their geographically distant loves ones (*constraining access to loved ones*), making the maintenance of close relationships with them difficult. Of particular concern to Community Participants was not being able to help their loves ones in times of need when river navigability was low.

2. *Eroding food-sharing networks:* Community Participants described how patterns of food sharing within and amongst the citizens of Fort Chipewyan have declined due to poor river navigability. The larger collective territories of MCFN and ACFN traditionally consisted of smaller family territories in which, as explained by Community Participants, families generally harvested and gathered food and materials and built camps or cabins. The family-based organization of the waterscape for subsistence purposes deepened each family's familiarity with and limited competition for food resources in any one part of the waterscape:

> Families have their areas where they have their cabins and my cabin is right here and that is where I grew up and would stay with my family and hunt and trap. My uncle's cabin is right here at the creek next door and we would go there sometimes and he would come to our cabin too…No, people could go to other areas if they needed to but people knew their areas and how to hunt there and people respected the areas but now people go everywhere because they can't get to their cabin without water. Young people don't know those rules anymore and so now more people are hunting for the same moose. The moose doesn't have a chance and now many people don't get any moose because there is not enough in one area (Community Participant 14)

Community Participants observed that low river flows are preventing some families from accessing their loved ones' cabins (*constraining access to loved ones*) or family harvesting sites (*constraining access to harvesting grounds*), forcing them to hunt, trap, and fish outside of their family territories in an increasingly smaller area. Consequently, the family-based organization of the waterscape has eroded and competition for food resources has increased, causing declines in populations of preferred game species and more frequent unsuccessful hunts. More frequent unsuccessful hunting trips have eroded wider community food sharing pathways.

When hunting was successful, hunters "used to share meat with people from the whole community" who were unable to harvest and gather their own food so that "everyone had enough to eat" (Community Participant 13). Sharing the spoils of hunting also enabled the continued consumption of preferred foods which was considered vital to Community Participants. For example, Community Participant 16 described his experience sharing food with someone who had not tasted game meat in a long time: "I gave her some moose meat and she cried she missed tasting it so much". As hunting success becomes less certain, hunters need to "keep the meat for their kids" because they "might not shoot a moose again or get enough ducks" (Community Participant 16), reducing sharing of food, especially preferred food, with families that do not hunt. Poor river navigability, then, has caused patterns of food harvesting and sharing to erode,

increasing vulnerability to food insecurity, especially for preferred foods harvested from the waterscape.

3. *Eroding knowledge sharing pathways*: Community Participants explained that knowledge sharing consists of teaching (transmission) and learning (acquisition) that are disrupted when river navigability is poor. Teaching and learning, to Community Participants, are most effective when they occur in real time in the bush:

> Young people go out in the bush with the Elders, the Elders show them how to set snares where the rabbits are, show them the fat ducks, and where to find fish and moose. Even how to pull these roots that have long white centres that are eaten. The Elders have to show them that and then the young people have to go out there and do it themselves and maybe they make mistakes but they have been shown how (Community Participant 4)

According to Community Participants, poor river navigability constrained knowledge sharing by causing fewer opportunities for Elders and experienced river users and less experienced river users to spend time together in the bush. For example, Community Participant 6 explained how he is losing opportunities to teach his children about the waterscape because his children, due to low river flows, are starting to perceive boating as a chore rather than an enjoyable activity (*boating accidents: damaging equipment, injuring people*):

> getting stuck so much my kids don't want to go out [boating] with me any more because they have to spend their time pushing through sand bars…I won't be able to teach them about the land if they don't want to come with me

In addition to the loss of knowledge sharing opportunities, Community Participants described how poor river navigability is also narrowing the nature of the knowledge that is shared because culturally important places in MCFN's, ACFN's and FCM's territories are no longer physically or safely accessible (*constraining access to cultural sites*). For example, Community Participant 6 described how he cannot take his son to places where he went as a young boy to show him sites important to their family's history:

> Mamawi [Lake] is drying up and we can't get far past Dog Camp now. I can't take my son who is almost seven [into] where I went when I was his age…There was good duck hunting in here and I can't show him where his great grandfather built a cabin to stay in when he was duck hunting

To Community Participants, as boating becomes more about damage control than different generations of people spending time together at places that are important to them,

intergenerational place-based knowledge sharing is degraded. These losses were deeply felt by Community Participants who perceive their "knowledge [as] the future of [their] peoples" (Community Participant 26).

4. *Disabling waterscape-based livelihoods*: Community Participants defined water-based livelihoods as the acts of obtaining food and other gifts from the waterscape by hunting, trapping, fishing, and gathering for subsistence and commercial purposes. Poor river navigability was observed by Community Participants to directly contribute to a decline in water-based livelihoods in four ways. First, boating is an expensive endeavour, and boating costs rise when more fuel is used to travel longer distances to avoid shallow river channels (*lengthening travel routes*) and equipment needs to be repaired following collisions with sandbars during low flow periods (*boating accidents: damaging equipment*). Community Participants could not use their boats for harvesting if they could not afford the fuel or equipment. Second, Community Participants were sometimes forced to limit their harvesting of preferred species or harvest in smaller areas when low flows make parts of the waterscape inaccessible, increasing competition for preferred species (*limiting access to harvesting grounds*). Increased competition amongst Community Participants placed increased pressure on animal populations, reducing the success rate of harvesting trips. Reduced harvesting can increase reliance on expensive store-bought food which can then take financial resources away from future boating trips if the Community Participants could not access large commercial centres (*limiting access to commercial centres*), creating a positive feedback loop that can diminish Community Participants' waterscape-based livelihoods in the long-term. Fourth, when Community Participants are either in or hear about boating accidents, they can become reluctant to continue boating: "makes me think twice about going out when I see people come back with cut eyes…getting hurt when they hit a sandbar" (Community Participant 18) (*boating accidents: injuring people*). When Community Participants are unable or unwilling to go boating due to financial, behavioural, and safety barriers created by poor river navigability, they experience disabled waterscape-based livelihoods that in turn contributes to *eroding food-sharing networks* and *degrading knowledge sharing pathways.*

Community Participants described how some people seek employment to fund waterscape-based livelihoods but paradoxically this can further reduce boating opportunities. Since "making

a living from the land is hard…people are leaving town to find jobs because they want to feed their families" (Community Participant 17). Wage jobs, Community Participants explained, provide money but then "[river users] have no time to hunt [and are] taken away from the land" (Community Participant 17). Hence, waterscape-based livelihoods are both supported and weakened by wage jobs.

5. *Losing our languages*: Fort Chipewyan is a multilingual community where Cree, Dene, and English are commonly spoken, but Community Participants described how it is mostly older people that are fluent in the Indigenous languages. Although Community Participants attributed the lack of Indigenous language fluency amongst youth to many causes such as the decline in Indigenous language use by adults who attended residential school, interest in English television and games, and the dominance of English in the current school system, they also linked it to poor river navigability. Poor river navigability, as explained by Community Participants, contributed to the loss of language because it constrained how, when and where Elders and young people spend time together in the bush. For example, Community Participant 16 explained that "young people learn to speak our language…by spending time with the Elders on the land" but "they cannot do that very much anymore" because "the water is dried up". When youth spend time in the bush with Cree or Dene speaking Elders, youth can "experience their language in action" (Community Participant 22), meaning that youth can more easily learn their language if it is part of carrying out bush activities:

> Elders speak their language to teach the kids how to dry fish or set nets so the kids see what the words mean and that makes it easier for them to learn their language (Community Participant (Community Participant 4)

Youth and Indigenous language speaking Elders were not spending time together in the bush because poor river navigability has been *disabling waterscape-based livelihoods*. Specifically, poor river navigability has made "many areas impossible to get to with boats" (Community Participant 22), separating Community Participants from their waterscapes; caused "young people [to] leav[e] town to find jobs because they can't make money off the land anymore" (Community Participant 14), meaning they cannot spend as much time with Elders in the bush; and made "people scared to go out on the water in case they get into an accident hitting a sandbar" (Community Participant 18). As Elders and youth became disconnected from each

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other and with the waterscape due to poor river navigability, Community Participants contend that language became more difficult to pass on to the next generation.

5.1.2 Convergence of Positive and Negative Framings of the Importance of River Navigability

The positive and negative framings of the importance of river navigability to the Indigenous peoples of the Peace-Athabasca Delta converged around the categories related to continuing across change and exercising treaty rights. The convergent categories exhibited inverse rather than different processes in each framing, which are explained below, first for continuing across change followed by exercising treaty rights.

5.1.2.1 *Continuing Across Change*

Continuing across change refers to MCFN, ACFN and FCM citizens' collective ability to adapt to environmental, social, economic, and technological changes that intersect with their lives in ways that are meaningful to them. When their citizenries can meaningfully continue across change, they are considered by Community Participants to be collectively well. Continuing across change in the positive framing is represented by the category of *continuing across change preferentially* (Roman numeral III in Figure 5.1) consisting of *engendering collective identity*, *possessing agency*, and *continuing through change constructively*. When their citizenries are unable to meaningfully continue across change, they are considered by Community Participants to be collectively unwell. Continuing across change in the negative framing is represented by *uncertainly continuing across change* (Roman numeral III in Figure 5.2) consisting of *eroding collective identity*, *declining agency*, and *being vulnerable to change*. Since continuing across change in the positive and negative framings of river navigability are inverse, the processing making up continuing across change in the positive and negative framings are presented together below.

Engendering collective identity / eroding collective identity: According to Community Participants, river navigability has implications for the collective identities of MCFN's, ACFN's and FCM's citizenries. Community Participants described caring as being core to their identity: "our people are caring" (Community Participant 26) and "we are taught to care about the people,

the land, water, animals starting when we are very young and we grow up with that" (Community Participant 4). As described in section 5.1.1, Community Participants observed that river navigability was an enabler of three caring processes, including *the waterscape caring for people* (positive framing), *people caring for the waterscape* (positive framing), and people caring for people as part of kinship networks (e.g., food sharing, helping in times of need, knowledge sharing) (*disrupting community-based kinship* in the negative framing). In short, Community Participants explained that as river navigability improves, so does the robustness of caring between people and between people and the waterscape. Since river navigability enabled caring and caring was a core element of the Community Participants' identities, river navigability engendered identity if it was superior and eroded identity if it is poor.

When referring to identity, Community Participants used collective phrasing over individual phrasing. Statements that referred to our, us or we such as "it is our culture" (Community Participant 23), or "that is who we are" (Community Participant 18) were considered collective phrasing as they encompassed the citizenry of MCFN, ACFN, or FCM. Phrases referring to individuals such as "this is who I am" (not a direct quote) were not heard when identity was discussed, although individuality sometimes emerged when people spoke about their own feelings or experiences. For example, Community Participant 2 spoke about himself as an individual when he explained "I hurt when I see the dead muskrats in their dens". However, when people spoke of themselves, they also provided examples of others with similar feelings or experiences such as "[he] saw the dead rats too and almost cried" (Community Participant 2), suggesting that Community Participants placed emphasis on their collective rather than individual identity.

Sustaining agency / Declining agency: Community Participants have "seen lots of changes in [their] lifetime…some good and some bad… [and they] need to adapt to change in [their] own ways that they want" (Community Participant 23). Community Participants described how their agency to deal with change is positively correlated with their connectivity to the waterscape: "if people keep going on the land and stay connected that way, we can deal with anything" (Community Participant 2). Since Community Participants' connectivity to the waterscape is dependent in part on river navigability as described in section 5.1.1, river navigability affected

the Community Participants' agency to deal with change. Superior river navigability sustained people's agency and poor river navigability caused people's agency to decline.

Continuing through change constructively / Being vulnerable to change: Continuing through change constructively and its inverse being vulnerable to change capture the Community Participants' perspectives on the interaction of collective identity and agency that fosters their ability to deal with change. To Community Participants, a strong collective identity fostered the agency needed to respond to change constructively: "we fight to protect our way of life…all this so our kids can survive when things go bad, so they can rely on themselves to find food and build a home" (Community Participant 19). Inversely, to Community Participants, an eroded collective identity increases their vulnerability to change: "industry will keep coming, the birds are probably never coming back and people will leave town…we will die out if we lose what is inside [pointing to chest]" (Community Participant 17). The agency to deal with change fostered by collective identity in turn fosters collective wellness as explained by Community Participant 4: "they don't need to tell us what we need [because] they don't know what we need…we know how to make ourselves healthy" (Community Participant 4). Declining agency, as explained by Community Participant 17, has the potential to disappear MCFN, ACFN, and FCM: "our cultures in Fort Chip will be gone if we let southerners tell us what we need to live". In short, Community Participants considered their ability to continue across change fostered through collective identity and agency as a signal of their collective wellness. If Community Participants were able to continue across change constructively, they were collectively well, but if they were vulnerable to change, they were collectively unwell.

5.1.2.2   Exercising Treaty Rights

Exercising treaty rights refers to the ability of Community Participants to practice their Treaty No. 8 rights to hunt, trap, and fish within their territories in ways that are meaningful to them using motorized boats, their preferred mode of transportation. When river flows were high, Community Participants described being able to exercise their treaty rights in ways that were meaningful to them (*meaningfully exercising treaty rights,* Roman numeral IV in Figure 5.1), but when river flows were low, Community Participants described being constrained in their ability

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to exercise their treaty rights (*constraining the exercise of treaty rights*, Roman numeral IV in Figure 5.2).

Since boating to access harvesting grounds is vital to the practice of treaty rights, Community Participants described it as "an ancillary right" (Community Participants 18 and 23) that was dependent on two processes, including *honouring water as boss* and *honouring treaty promises* in the positive framing and *dishonouring water as boss* and *dishonouring treaty promises* in the negative framing. Since they are inverses, the two processes related to exercising treaty rights in the positive and negative framings are presented together below.

(Dis)honouring water as boss: "Water is boss" (Community Participants 15, 22, 23) articulated the need to listen to, learn from, and protect freshwater because "everything there is depends on water" (Community Participant 14). To Community Participants, *honouring water as boss* meant that all forms of freshwater, including freshwater below and above ground and precipitation, are perceived as a single living entity on which all Creation depends and that the interrelatedness of water quality and quantity is respected:

> When we talk about water in hearings, water is split up, separated by where it comes from, the groundwater from the river and rain. But that is not right because all water is connected and it has to be treated all together even though it moves to different places…Water quantity affects quality and vice versa and they should not be separated (Community Participant 4).

> It doesn't matter if water is in the ground or in the river, water has a life force…water is living and it connects everything. Respect for that is important (Community Participant 17).

Dishonouring water as boss meant that "people don't respect the water, water is broken up and not allowed to live and flow where it wants" (Community Participant 26). To Community Participants, how freshwater is honoured implicates the ability of all tangible, intangible, human, and non-human components of Creation to have their freshwater needs met. When freshwater is honoured as boss, "everything will have water" (Community Participant 2), but when water is dishonoured, "the water dries up and everything dies" (Community Participant 4).

(Dis)honouring treaty promises: *Honouring treaty promises,* to Community Participants, represents how federal and provincial governments embraced Treaty No. 8 as demonstrated by three actions. First, the "the spirit of that treaty" (Community Participant 26) needed to be acted

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on by moving beyond "the words on paper" (Community Participant 14) to uphold the sharing relationship envisioned by the Indigenous treaty makers so that the First Nations can continue their way of life:

> My grandfather was there when the treaty was signed and my grandfather and my father told me the land [was to be] shared…we didn't give away the land, we wanted to share the land so that our children and their children could be on the land forever (Community Participant 26).

Second, treaty rights needed to be recognized as having priority over the rights held by industrial water users because "the treaty came first, not the oil sands water licences" (Community Participant 18). To Community Participants, recognizing the priority of their treaty rights would entail fulfilling MCFN's and ACFN's freshwater needs prior to those of the oil sands operators. Third, government agencies needed to recognize that their assertions that treaty rights were not altered by collaborative surface water quantity policy development was disrespectful to the First Nations. While treaty terms were not renegotiated through collaborative policy development, Community Participants explained that surface water quantity policy affects how treaty terms are implemented in practice, and therefore, alters their rights in practice:

> they tried to reassure us that our treaty rights would not be changed in that process [Phase 2] but that is not right because how can we hunt if there is not enough water and they are making decisions about water (Community Participant 18).

Collectively, the three preceding actions demonstrate how Treaty No. 8 promises could be honoured to facilitate cross-cultural freshwater policy development. When treaty promises are honoured, Community Participants contend that they will be able to "live the way [they] want to" (Community Participant 14), but when treaty promises are dishonoured by state governments in Canada, Community Participants "have their native lifestyles threatened" (Community Participant 17).

In sum, Community Participants explained that how state governments in Canada chose to honour freshwater and treaty promises impacted Community Participants' wellness through cascading implications. To Community Participants, how freshwater and treaty promises were honoured by Canadian state governments affected how they managed river flows which in turn affected river navigability. River navigability, explained the Community Participants, affected their boating capabilities that helped enable the caring between people and between people and

the waterscape (see section 5.1.1) that were core to their collective identities (see section 5.1.2.1). Having collective identities enabled the agency needed for the Community Participants to deal with societal, environmental, economic, and technological changes that they experienced in their daily lives (see section 5.1.2.1). As explained by Community Participants, their ability to determine how their communities continued across change signaled the wellness of MCFN's, ACFN's, and FCM's citizenries and was secured by their ability to exercise their treaty rights in ways that were meaningful to them. Thus, to Community Participants, exercising treaty rights in ways that were meaningful to them was vital to achieving Indigenous wellness.

5.1.3 Placing the Negative Framing in Environmental and Social Contexts

Community Participants placed the impacts of poor river navigability within the broader environmental and social contexts in which they live (Roman number V in Figure 5.2) to emphasize the importance of addressing river navigability in water policy. Community Participants described how a changed waterscape caused them to experience the sights, sounds, smells, tastes, and function of the waterscape differently from when they were young (*nature's looks, sounds, smells, tastes, and how it works have changed)*. For example, Community Participant 4 explained that "everything that [they] see has changed, things smell different and I don't hear the birds and buzzing insects as when I was a kid". Community Participant 22 added that "meat tastes different…fish flesh is slimy…there are no clouds of bugs any more…bird eggs are thin and break easily". Experiencing the waterscape changes also diminished the Community Participants' ability to hunt, trap, and fish along side poor river navigability: "the animals don't have as much to eat in some places so there is not as many of them to hunt" (Community Participant 2). Compounding the impacts of environmental changes were *legacy social problems from Canada's colonial history* that, according to Community Participants, disrupted the connection that some of MCFN's, ACFN's, and FCM's citizens have with the waterscape because they "lost their native lifestyle when they went to residential school" (Community Participant 17). To Community Participants, the broader environmental and social changes were "not an excuse to do nothing…to protect navigation" but rather catalysts for "everyone to work together to fix one of the problems that can be helped" (Community Participant 23). Stated differently, the accumulation of many problems such as poor river navigability, environmental change, and colonialist social harms that disrupted the Community Participants' collective

wellness should not be perceived as insurmountable. Rather, the opportunity to fix one part of any of the problems such as that presented by policy development to improve river navigability should be seized as one means to help the Community Participants achieve their collective wellness.

5.2   Honourably Bridging for Wellness: Understanding why the Aboriginal Navigation Flows were Developed

As described in the *As Long as the Rivers Flow Report,* MCFN and ACFN introduced the ANF for incorporation into the SWQMFLAR so that industrial water withdrawals would not degrade river flows in ways that would prevent their citizens from accessing their territories in exercise of their Aboriginal and treaty rights (Candler et al., 2010). Behind this general goal was a deeper purpose for the introduction of the ANF labelled here as *honourably bridging for wellness*. *Honourably bridging for wellness* represents how MCFN and ACFN wanted to honour the Treaty No. 8 relationship by conveying their wellness needs to federal and provincial governments in ways that simultaneously held true to their worldviews and that respected the needs of federal and provincial governments participating in a cross-cultural freshwater governance arena. *Honourably bridging for wellness* is comprised of three processes, including *adapting to secure our wellness*, *finding strength in ourselves*, and *honouring sharing relationships*, which are expanded on below. Figure 5.3 visually depicts the three processes comprising *honourably bridging for wellness.*

Figure 5.3: Aboriginal Navigation Flows – An honourable bridging of cross-cultural policy-making to achieve Indigenous wellness

5.2.1 Honourably Bridging for Wellness: Adapting to Secure our Wellness

Adapting to secure our wellness represents MCFN's and ACFN's use of a policy tool that harmonized with existing structures in the freshwater governance arena through which the SWQMFLAR was being developed (*harmonizing solutions*), made difficult due to differences between their perspectives and the perspectives held by federal and provincial governments on freshwater management. Existing structures within the freshwater governance arena included legal rules around rights assertions and approaches to establishing water withdrawal rules. Community Participants described struggling with the freshwater management approach developed through CEMA because it was grounded in finding the flow at which a part of the aquatic ecosystem would be harmed. To Community Participants, the approach was equivalent to asking at what point will that part of the river die. Community Participants preferred that freshwater management focus on sustaining the health of the whole river ecosystem rather than preventing the death of one of its parts. Reconciling the different perspectives on freshwater management was facilitated using outside experts (i.e. Firelight Research Group) who were able to work with Traditional Knowledge and Western Science in ways that MCFN and ACFN

deemed respectful. The outside experts with the ability to work in both knowledge systems also helped translate the complex relationship between Indigenous wellness, treaty rights, river navigability, and boating into quantitative hydrologic terms used by federal and provincial governments (*translating our wellness conceptions*). Since the hydrologic terms were known to state governments, Community Participants expected that the quantitative translations would be understandable and useable by federal and provincial governments. The efforts to reconcile different worldviews on freshwater management and translate their interests into quantitative terms were considered necessary to Community Participants because they understood their legal obligations around rights assertions to include articulation of how their rights are impacted by an activity, the consequences of the impacts, and solutions that prevent impacts to those rights (*satisfying legal rules*). If they were unable to fulfill the legal obligations, Community Participants were concerned that their wellness needs would not be accommodated in the SWQMFLAR. In short, to meaningfully influence the GoA's preparation of the SWQMFLAR, Community Participants described needing to harmonize their proposed policy tool with those used by federal and provincial governments by translating their wellness needs in ways that also satisfied legal rules around rights assertions. Table 5.4 provides a definition for each of the three actions constituting *adapting to secure our wellness*, along with quotes to connect the findings to the data.

Table 5.4: Three actions constituting Adapting to Secure our Wellness

Category	Definition	Quote
Translating our wellness conceptions	Conveying the complex relationship between Indigenous wellness, treaty rights, river navigability, and boating to federal and provincial governments was a difficult task made even more challenging because of differing perspectives on the appropriate underlying philosophy of freshwater management. To Community Participants, federal and provincial governments focused on preventing death of a part of a river instead of protecting the holistic health of the river as a living being.	The thresholds and recommendations developed in this study offer a way to "translate" our treaty rights and cultural needs into a format that can be used to inform policy and decision-making on the Lower Athabasca River (Chiefs of MCFN and ACFN in the Foreword to the *As Long as the Rivers Flow Report,* In Candler et al., 2010, p. 7). We think differently than [federal and provincial government representatives]…more water shouldn't be taken than what is needed [because] why would we want to almost make the water die (Community Participant 17).
Harmonizing solutions	Research participants desire to find a policy tool that was similar to the approach used by the P2FC to establish water withdrawal rules for the surface mineable oil sands industry.	We watched that process [P2FC] closely and we wanted to work with that but we didn't see our rights being protected so we had to, so the [ANF] was perfect for that because it pushed for a threshold to sustain our rights (Community Participant 23).
Satisfying legal rules	Research participants understood their legal obligations to include articulating how their rights are impacted by an activity, the consequences of the impacts to MCFN's and ACFN's rights and lifeways, and solutions that prevent impacts to those rights	We wanted to be left alone to do our own thing but our lawyers told us we had to provide information or it would be too late and our rights would be left out…we always have to explain how our treaty rights are not being protected and how they should be protected and we shouldn't have to do that (Community Participant 18).

5.2.2 Honourably Bridging for Wellness: Finding Strength in Ourselves

Community Participants described many challenges they experienced due to poor river navigability (Figure 5.2, section 5.1), and they also situated those challenges within the context of larger social problems rooted in Canada's colonial history that have eroded cultural knowledge (e.g., impacts of attending the residential school in Fort Chipewyan). Despite these challenges, Community Participants described how they are improving the wellness of their community by *finding strength in ourselves*. *Finding strength in ourselves* was a process internal to MCFN and ACFN comprising three actions that relied on and enhanced their confidence in their Traditional Knowledge to effect change in how freshwater is managed in ways meaningful to their citizens. First, Community Participants described the importance of younger or less experienced river users *listening to Elders* because they speak with wisdom and

truth. Second, Community Participants who are Elders explained how they are often expected to share their knowledge without being asked, but that a more respectful approach is for younger or less experienced river users to actively seek out knowledge by *asking river users* to teach them. Third, MCFN and ACFN citizens were described by Community Participants as recognizing the value of their knowledge which fostered the self-reliance and confidence necessary for them to find their own preferred solutions to the river navigability problems they were experiencing (*valuing our knowledge*). Collectively, to Community Participants, by actively seeking and listening to Elders' knowledge and valuing that knowledge, MCFN and ACFN were able to be strong and confident in finding and achieving solutions grounded in their knowledge as they participated in SWQMFLAR development. Table 5.5 provides a definition for each of the three actions constituting *finding strength in ourselves*, along with quotes to connect the findings to the data.

Table 5.5: Three actions constituting Finding Strength in Ourselves

Category	Definition	Quote
Listening to river users	Younger or less experienced river users need to listen to Elders because they speak with wisdom and truth.	our Elders tell us about the way it was and the changes they see, they knew what was coming and what it meant. I know they speak the truth when they talk and we need to listen to them (Community Participant 24)
Asking river users	Elders are willing to share their knowledge, but as a sign of respect, younger or less experienced river users should actively seek out that knowledge by asking Elders teach them.	Elders, we talk about the water, the animals and the young guys they listen but they need to ask us about the water and the land because then they respect us…We see that they come to us now asking about the water and that is good. We can teach them about the water when they come to us (Community Participant 26).
Valuing our knowledge	When MCFN and ACFN citizens value their communities' knowledge, they can become self-reliant and confident. Through that self-reliance and confidence, MCFN and ACFN citizens become strong in their ability to find and achieve their own solutions to the problems they experience.	We are tired of letting others tell us what we need, we know what we need. Southern people, they don't see the water…we see the water, live with the water everyday and we know what the water needs and what our people need. We need to believe in that and show our young people that they need to believe in that (Community Participant 17). we rejected that [the P2FC recommendation] too because it did not include this treaty rights threshold. So, what did we do? We went off, us and ACFN, and we said, "You know what, we need to come up with this ourselves". We did that to help our people's lives because we can't rely on other people (Community Participant 23).

5.2.3 Honourably Bridging for Wellness: Honouring Sharing Relationships

Honouring sharing relationships represents MCFN's and ACFN's need, as explained by Community Participants, to honour the relationship created by Treaty No. 8 through which Indigenous peoples and federal and provincial governments share the lands inextricably and permanently. To Community Participants, when MCFN and ACFN and federal and provincial governments are working collectively to protect treaty rights, they signal that the sharing-based relationship established under treaty is being honoured. *Protecting treaty rights* is comprised of two actions, including *tending to treaty responsibilities* and *explaining treaty rights provisions*:

> *Tending to treaty responsibilities*: Community Participants explained that, as treaty partners, MCFN and ACFN have their own responsibilities towards federal and provincial governments that need to be fulfilled. To Community Participants, MCFN's and ACFN's responsibilities consisted of (i) the need to convey their knowledge, interests, and policy solutions clearly and comprehensively to federal and provincial governments because government representatives could not be expected to intuitively know that information; and (ii) be willing to cooperate with federal and provincial governments on devising policy solutions. By fulfilling their responsibilities under the treaty, MCFN and ACFN were described as showing respect for federal and provincial governments.

> *Explaining treaty rights provisions*: Community Participants described how MCFN and ACFN respected their citizens by repetitively explaining to federal and provincial governments how the rights provided by Treaty No. 8 should be understood and implemented.

To Community Participants, *protecting treaty rights*, enabled by actions that respected federal and provincial and MCFN and ACFN citizens, was vital to MCFN and ACFN because exercising treaty rights was a pathway for achieving wellness on their terms within a multi-cultural society. By being well, MCFN and ACFN cultures will exist for many generations. Table 5.6 provides definitions for the actions constituting *honouring sharing relationships*, along with quotes to ground the findings in the data.

Table 5.6: Actions constituting Honouring Sharing Relationships

Category	Definition	Quote
Sharing relationships	Treaty No. 8 established a relationship between MCFN and ACFN and federal and provincial governments to share the lands	Us and them, we made promises to share this land together and we have to remember we did that in everything we do. We are in this together, forever (Community Participant 26).
Tending to treaty responsibilities	MCFN and ACFN have their own responsibilities towards federal and provincial governments under the treaty that need be fulfilled. MCFN's and ACFN's responsibilities consisted of (i) the need to convey their knowledge, interests, and policy solutions clearly and comprehensively to federal and provincial governments because federal and provincial governments could not be expected to intuitively know that information; and (ii) be willing to cooperate with federal and provincial governments on devising policy solution. By fulfilling their responsibilities under the treaty, MCFN and ACFN showed respect for federal and provincial governments.	We are extremely proud to be proactive in developing methods for implementing our Treaty Rights in planning and decision-making processes. We see this as part of our responsibility in honouring our Treaty relationship with the Crown and our responsibility to our future generations (Chiefs of MCFN and ACFN in the Foreword to the *As Long as the Rivers Flow Report,* In Candler et al., 2010, p. 7). Government doesn't understand our community, so we need to tell them about us so they understand (Community Participant 4) To show respect, we wanted to work with them [federal and provincial governments] on the [ANF] as two government partners (Community Participant 23)
Explaining treaty rights provisions	MCFN and ACFN showed respect for their citizens and stood up for them by repetitively explaining to federal and provincial governments how the rights provided by Treaty No. 8 should be understood and implemented.	Every chance we tell them [federal and provincial governments], we remind them about what our rights mean and [the ANF] helps with that…the people need this to stand up for their lands and culture (Community Participant 18).
Protecting treaty rights	When federal and provincial governments and MCFN and ACFN work together to uphold and protect treaty rights, the treaty relationship will be honoured for the benefit of all people. MCFN's and ACFN's cultural longevity, and hence wellness, depend on the sharing relationships established under treaty being honoured by all people.	It was an Aboriginal rights based threshold. That's how we view everything when look at it a land management or any type of environment based threshold is we look at it from a rights based perspective because our motive in all of this is to protect our treaty rights in conjunction with how developments could happen (Community Participant 23) Why do these people really do everything possible to protect this right and to exercise this right? The reasons why we were asking for that rights protection is because that was our only connection to the land. Without that connection, there could be no Mikisew Cree, there could be no ability to pass on knowledge to your children, your grandchildren. Your culture will be broken (Community Participant 23). When they [federal and provincial governments] help protect our rights with us we will be doing what our grandfathers told us about the treaty …that will be a good day for all young people (Community Participant 26).

5.3 Summary

Constructivist grounded theories into the importance of river navigability to the Indigenous peoples of the Peace-Athabasca Delta and the rationale for ANF development revealed the significance of the ANF to MCFN and ACFN. Community Participants described the importance of river navigability through two concepts that address circumstances where they experienced superior and poor river navigability, including *buoying wellness through superior river navigability* and *running wellness aground through poor river navigability*. As explained by Community Participants, superior river navigability enabled the boating necessary to sustain the symbiotic caring between people and the waterscape which in turn fostered strong collective identities within the citizenries of MCFN, ACFN, and FCM. Strong collective identities fostered the agency the Community Participants needed to allow them to continue through change in their preferred ways. Possessing agency was considered by Community Participants to be a manifestation of their collective wellness which was secured by their continued exercise of their treaty rights. Inversely, Community Participants described how poor river navigability disabled boating capability in ways that disrupted kinship within the citizenries of MCFN, ACFN, and FCM. To Community Participants, disrupted kinship increased their vulnerability to change by causing their collective identities to erode which in turn diminished their agency to deal with change. Vulnerability to change was, to Community Participants, a signal that their wellness was weakened in part because their ability to exercise their treaty rights was constrained. In short, river navigability was important to Community Participants because of its positive correlation to their collective wellness.

To restore the river navigability needed to sustain their collective wellness, Community Participants explained that MCFN and ACFN developed and promoted the ANF as a policy solution to be incorporated into the water withdrawal rules and monitoring provisions in the SWQMFLAR. Community Participants perceived the ANF as a tool that could honourably convey their wellness needs within a cross-cultural governance arena because to them it simultaneously respected their worldviews and their understanding of state government needs. Specifically, Community Participants described how they adapted to meaningfully influence the GoA's preparation of the SWQMFLAR by translating their wellness needs into quantified terms that harmonized with the federal and provincial governments' policy-making approach and

fulfilled their understanding of their legal obligations for communicating impacts to their treaty rights. To Community Participants, asking for, listening to, and valuing their Traditional Knowledge provided the self-reliance and confidence that MCFN and ACFN needed to develop and introduce the ANF. As explained by Community Participants, the ANF were grounded in the protection of treaty rights in ways that to them respected state governments and MCFN and ACFN citizens because exercising treaty rights was considered a means for achieving wellness within a multi-cultural society. Thus, to Community Participants, the ANF were a means to secure the continuity of their people for many generations. The ANF's significance drove the First Nations' desire to understand the factors that influenced state government adoption of the ANF as described in the next chapter.

CHAPTER 6 – RESULTS FOR RESEARCH QUESTIONS 2A AND 2B: NARRATING THE ETHICAL SPACE OF ADOPTION OF ABORIGINAL NAVIGATION FLOWS

6.0   Introduction

Chapter Six presents the findings of Research Questions 2a and 2b on the barriers and drivers to the GoA's adoption of ANF from the perspectives of Community Participants and Government Participants. Community and Government Participants' perspectives were explored and presented separately because the third ESF dimension encourages peoples who are engaging with each other to deeply explore and understand their own perspectives (Ermine, 2007). To facilitate the explorations of the different perspectives on the barriers and drivers to ANF adoption, the IIF was overlaid on the analysis of interviews and documents using constructivist grounded theory methods to "show how the factors were or were not accounted for in the [adoption] of the innovation" (Steelman, 2010, p. 156). Intersecting the third ESF dimension and IIF in this way to explore Research Questions 2a and 2b resulted in the identification of keystone, or most influential, factors and the population of the IIF four times: Community Participant narrative on drivers, Community Participant narrative on barriers, Government Participant narrative on drivers, and Government Participant narrative on barriers.

Before sharing the Community and Government Participant narratives, commentary to facilitate reading and understanding the findings is needed. First, the findings on the barriers and drivers are presented as summary tables at the start of sections 6.1 and 6.2 followed by detailed descriptions of each of the IIF factors that were barriers and drivers to ANF adoption. The summary tables are provided before the detailed descriptions to help orient the reader within this terminology heavy chapter. The detailed descriptions explain how IIF factors were (not) accounted for in ANF adoption and provide quotes and participant attributions to ground the findings in the data. Second, the detailed descriptions of each of the IIF factors that were barriers and drivers to ANF adoption are presented using the format of the IIF to facilitate the narrative comparison under Research Question 2c in Chapter Seven. Third, some citations are included in the detailed descriptions of the IIF factors but these refer to documents that were analyzed for this research or references that provided the formal name of legislation or

documents. The citations do not refer to literature woven into the findings. Fourth, the detailed descriptions, and the quotes they contain, sometimes refer to concepts (e.g., AXF), groups (e.g., P2FC), or other entities that were explained in the narrative account of policy-making provided in Chapter Four. To ease reading of Chapter Six, the acronyms and entities are described in Table 6.1.

Applying the IIF to the adoption of ANF needed three adjustments in the IIF factors, including norms and harmony, congruence, and rules and communication, to fit the findings that emerged from the initial constructivist grounded theory analysis. The adjustments in norms and harmony and congruence reflect the application of a framework devised for innovation implementation to understand innovation adoption. The adjustment in rules and communications is a formatting adjustment. Specially, the three adjustments to the factors are as follows:

1. Norms & Harmony represent people's desire to preserve social norms and relationships in the workplace, making them predisposed to implementing innovations that preserve those relationships (Steelman, 2010). This research expanded this conceptualization to include disharmony; advocacy that creates disharmony within a workplace may foster different ways of thinking about an innovation to preserve newly acceptable norms.

2. Congruence is the degree to which values held by individuals align with the values of the organization within which they work (Steelman, 2010). This research expanded this conceptualization to include intra-constellational congruence and inter-constellational congruence. Intra-constellational congruence is the alignment in the values or perspectives held by members of any one group of participants. The values considered relevant to intra-constellational congruence were the values or perspectives that influenced innovation adoption from the perspectives of the organizations that introduced or are considering the adoption of an innovation. Innovation adoption is likelier when there is intra-constellational congruence. Inter-constellational congruence refers to the degree of alignment in the values or perspectives represented by an innovation and the values of an organization that is considering innovation adoption. Innovations are likelier to be adopted when there is inter-constellational congruence.

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3. Rules and Communications are combined into one category in the IIF but are presented separately here to ease readability given the length of factor descriptions presented below.

Table 6.1: Descriptions of the entities, processes, and concepts referred to in the IIF factor descriptions

Entity, Process, or Concept	Description of Entity, Process, or Concept
AXF	Aboriginal Extreme Flow, the threshold that Mikisew Cree and Athabasca Chipewyan First Nations proposed be applied as a surface mineable oil sands industry-wide water withdrawal cut-off threshold in the *Surface Water Quantity Management Framework for the Lower Athabasca River*. The Aboriginal Extreme Flow was a component of the Aboriginal Navigation Flows.
CEMA	Cumulative Environmental Management Association, the consensus-seeking, collaborative entity convened by the Government of Alberta and federal Fisheries and Oceans Canada to determine the instream flow needs of the Lower Athabasca River.
Instream flow needs	Flow regime needed for full, long-term protection of the Lower Athabasca River aquatic ecosystem. The process for determining instream flow needs is a type of environmental flow assessment. The work to determine the instream flow needs provided the foundation for the setting of water withdrawal rules in the *Surface Water Quantity Management Framework for the Lower Athabasca River* for the surface mineable oil sands industry.
P2FC	Phase 2 Framework Committee, a consensus-seeking, collaborative committee comprised of Indigenous peoples, industry representatives, federal and provincial government representatives, and environmental advocacy groups. Mikisew Cree and Athabasca Chipewyan First Nations withdrew their committee membership but remained observers. The Phase 2 Framework Committee was convened to recommend a set of water withdrawal rules to manage the long term, cumulative oil sands mining industry water withdrawals from the Athabasca River by a hard deadline of December 2009. To complete its work, the P2FC engaged in a professionally facilitated structured decision-making process.
Phase 1 of policy-making	The first phase in policy-making that ultimately led to the release of the *Surface Water Quantity Management Framework for the Lower Athabasca River*. Phase 1 was undertaken through the consensus-oriented and collaborative Cumulative Environmental Management Association.
Phase 2 of policy-making	The second phase in policy-making that ultimately led to the release of the *Surface Water Quantity Management Framework for the Lower Athabasca River*. Phase 2 was undertaken by the consensus-oriented and collaborative Phase 2 Framework Committee that used a professionally facilitated, structured decision-making process to recommend to Government of Alberta and the federal Fisheries and Oceans Canada water withdrawal rules for inclusion in the *Surface Water Quantity Management Framework for the Lower Athabasca River*.
Phase 3 of policy-making	The third and final phase in policy-making that ultimately led to the release of the *Surface Water Quantity Management Framework for the Lower Athabasca River*. Phase 3 was led by the Government of Alberta and the federal Fisheries and Oceans Canada and consisted of their preparation of draft policy documents based on the Phase 2 Framework Committee's recommendations. As part of Phase 3, the provincial and federal governments sought feedback on draft policy documents from First Nations as part of a larger public review, and it was during this period that Mikisew Cree and Athabasca Chipewyan First Nations introduced the Aboriginal Navigation Flows.
SWQMFLAR	*Surface Water Quantity Management Framework for the Lower Athabasca River,* the policy released by the Government of Alberta to regulate water withdrawals from the Lower Athabasca River by the surface mineable oil sands industry. The Mikisew Cree and Athabasca Chipewyan First Nations introduced the Aboriginal Navigation Flows while the Government of Alberta was preparing the *Surface Water Quantity Management Framework for the Lower Athabasca River* during Phase 3 of policy-making. River navigability monitoring provisions were included in the *Surface Water Quantity Management Framework for the Lower Athabasca River,* but not water-withdrawal cut off limits based on the Aboriginal Extreme Flow.

6.1   Influences of ANF Adoption from the Community Participants' Perspectives

Section 6.1 presents the Community Participants' perspectives on the drivers and barriers to the GoA's adoption of ANF in two formats. The Community Participants' perspectives are first presented in summary tables to help orient the reader within this terminology heavy chapter. Table 6.2 summarizes the drivers and Table 6.3 summarizes the barriers to ANF adoption from the Community Participants' perspectives. Next, the Community Participants' perspectives are presented using the IIF format to explain in detail how IIF factors were (not) accounted for in ANF adoption. The detailed descriptions for each factor provide quotes and participant attributions to ground the findings in the data.

Table 6.2: Community Participants' perspectives on the drivers of the GoA's adoption of ANF

For brevity, attributions to Community Participants and quotes have been removed from the synthesis provided in the table, but all information in Table 6.2 constitutes Community Participant perspectives.

Individual Level	Structural Level	Cultural Level
Motivation Keystone influence. See section 7.1. **Norms & Harmony** Community Participants described two drivers related to norms and harmony: 1. Community Participants explained that MCFN and ACFN fostered disharmony amongst CEMA members to show that changes in analytical norms were harmonious with one of CEMA's broader objectives to listen to Indigenous peoples as part of cross-cultural collaboration. One of CEMA's objectives was to bring together Traditional Knowledge and Western Science for the management of the Lower Athabasca River, but non-Indigenous CEMA members in the early years were establishing criteria for the instream flow needs work based on only their perspectives about waterscape health and river uses. By reminding non-Indigenous CEMA members that they committed to listening to Indigenous peoples, MCFN and ACFN were able to convince CEMA members to use different times of year in the analysis of impacts of oil sands water withdrawals to sensitize analyses to Indigenous river uses. 2. Community Participants explained that using creativity to overcome long, seemingly insurmountable troubles has become a norm for MCFN and ACFN. Creativity,	**Rules** To Community Participants, evolving rules, including constitutional rights protections, common law clarifications of consultation requirements, and policy commitments to engage Indigenous peoples because of their connections to the land, created space for MCFN and ACFN to participate in freshwater policy-making. Closely observing the policy-making process leading to the development of the SWQMFLAR, MCFN and ACFN worked hard to align their ANF submissions with the approach used to establish surface water quantity management rules so that their information was more easily understood and acted upon by government representatives. Collectively, evolving rules and the First Nations' efforts to align with policy processes facilitated the GoA's serious consideration of the ANF. **Communications** Community Participants explained that MCFN and ACFN combined internal and external communications' strategies to increase their influence in regional natural resource management planning generally and freshwater policy-making specifically: 1. The external strategies included letter writing campaigns, celebrity endorsement, press releases, treating all conversations as opportunities to educate government representatives, bilateral relationship building outside of government led policy processes,	**Shocks** Community Participants explained that upstream development on the Peace and Athabasca Rivers and MCFN's and ACFN's lack of influence in CEMA created a sense of urgency amongst MCFN and ACFN citizenries to have federal and provincial government representatives recognize poor river navigability as a real problem their citizens experience. However, that sense of urgency "came to a head" (Community Participant 14) after a series of boating accidents on the Lower Athabasca River involving MCFN and ACFN citizens that Community Participants attributed to low river flows in the Lower Athabasca River. The boating accidents acted as shocks, renewing MCFN's and ACFN's determination to have river navigability protected through the SWQMFLAR. **Framing** Community Participants explained that MCFN and ACFN were successful in shifting how CEMA framed the relationship between social, cultural, environmental, and economic goals. Initially, CEMA prioritized economic and environmental goals over social and cultural goals because social and cultural goals were thought to be achieved through a robust economy and functioning aquatic ecosystems. MCFN and ACFN partially disagreed with this characterization and asserted that their social and cultural goals needed to be understood as

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Individual Level	Structural Level	Cultural Level
demonstrated through the establishment of internal governance structures, community-based monitoring programs, and practices for using Western Science and Traditional Knowledge together, increased MCFN's and ACFN's influence on SWQMFLAR development. **Congruence** Intra-constellational congruence: Not applicable. Inter-constellational congruence: Most Community Participants agreed with what they perceived as GoA's characterization of policy-making as a values-laden process inclusive of a broad range of social, economic, and environmental goals. Community Participants wanted the GoA to be aware of this congruence so that the GoA would understand that the First Nations' objective was not to stop the oil sands; hence, be more willing to collaboratively modify ANF.	and using allied scientific experts to work with government representatives. These external communications' strategies strived to raise public and government awareness of Aboriginal and treaty rights, build relationships with regional actors, and convey their values and needs in terms familiar to government representatives. 2. Internal communications strategies, including the First Nations' decisions to cooperate and present a unified front to government and to advocate for their interests using their own knowledge, strengthened MCFN's and ACFN's external communications strategies. The external communications strategies created more equitable consultation processes while the internal communications processes strengthened community voices around river navigability. Community Participants mostly attributed the inclusion of river navigability provisions in the SWQMFLAR to the First Nations' communications strategies. **Incentives** Community Participants explained that funding from the GoA incentivized MCFN's and ACFN's participation in freshwater policy-making by supporting the development of the ANF but this was not considered a key facilitator by the First Nations. **Opening** The GoA's shared stewardship approach to water policy-making opened the political structure to MCFN and ACFN so that they had an opportunity to affect change by sharing their interests and	related to but separate from regional economic and environmental goals. The implications of defining cultural and social goals as distinct from but related to economic and environmental goals was that surface water quantity policy had to explicitly consider a broader range of interests, including river navigability. **Legitimacy** To Community Participants, the GoA gave the ANF and river navigability monitoring provisions prominent positions in the SWQMFLAR because it wanted to appear socially responsive to downstream Indigenous peoples' interests in the Lower Athabasca River. Appearing socially responsive was critical to the GoA's efforts to overcome the oil sands mining's negative reputation so that investment in oil sands developments would continue. However, the Community Participants felt that the GoA's attempts to legitimize provincial regulation of the surface mineable oil sands industry were insincere because the projected outcomes of the river navigability monitoring provisions in the SWQMFLAR did not meet MCFN's and ACFN's interests.

Individual Level	Structural Level	Cultural Level
	perspectives with other CEMA members. However, that opening was constrained by the GoA's reluctance to impose industry-wide water withdrawal cut-off thresholds. **Resistance** Not applicable.	

Table 6.3: Community Participants' perspectives on the barriers to the GoA's adoption of ANF

For brevity, attributions to Community Participants and quotes have been removed from the synthesis provided in the table, but all information in Table 6.3 constitutes Community Participant perspectives.

Individual Level	Structural Level	Cultural Level
Motivation Keystone influence. See section 7.1. **Norms & Harmony** To Community Participants, the GoA`s culture of risk aversion, lack of accountability, and complexity avoidance limited their ability to exercise creativity in problem solving around water withdrawal rules and finding new ways to engage each other in cooperative, symbiotic partnerships. Consequently, the GoA could not appreciate how urgent of a problem river navigability was to MCFN and ACFN and their ability to collaborate on refining ANF eroded. **Congruence** Intra-constellational congruence: Not applicable Inter-constellational congruence: Community Participants identified five areas of inter-constellational incongruence that shaped the GoA's use of ANF and how MCFN, ACFN, and GoA interacted over ANF: 1. To Community Participants, the GoA perceived Indigenous uses of the waterscape as homogenized, preventing them from understanding MCFN's and ACFN's family-based waterscape usage patterns. 2. To Community Participants, the GoA's unilateral derivation of river navigability provisions based on the ANF was considered	**Rules** Community Participants raised three barriers associated with rules that showed how legislative gaps and uncertainty constrained the options for water withdrawal rules that were considered by the GoA: 1. To Community Participants, the narrow scope of the federal *Navigable Waters Protection Act* that was in force in 2010 applied only to physical structures and fill placement, leaving the impacts of water withdrawals on river navigability without a regulatory "home" at the federal level. 2. To Community Participants, disputed legal and policy mechanisms for imposing more restrictive water withdrawal cut-off limits on senior licensees meant that the GoA could apply their interpretation of the rules to their benefit. 3. To Community Participants, unresolved Aboriginal and treaty rights questions contributed to differing expectations amongst the First Nations and the GoA about appropriate means for addressing rights-based assertions in the SWQMFLAR. **Communications** To Community Participants, MCFN and ACFN had to constantly establish new and reinforce existing communication channels due to high staff turnover within the GoA, and the GoA's	**Shocks** Not applicable. **Framing** Community Participants described how three frames shaped the GoA's use of ANF as explained below. 1. To Community Participants, the GoA's use of the word "changing" rather than "changed" suggested to Community Participants that the GoA perceived declines in ecosystem health as minor or acceptable, and that time was available to stop or reverse these declines if they continue. Consequently, to Community Participants, the GoA decided that the imposition of the AXF as a water withdrawal cut-off threshold unnecessary and that changing river navigability could be monitored and addressed if it became a problem. 2. To Community Participants, the GoA's freshwater management approach was cause oriented rather than problem oriented, which constrained the types of policy solutions the GoA would consider. Community Participants 3, 17, 22, and 23 described cause-oriented freshwater management as an approach that set out to apportion blame to the potential causes of declining river flows and then regulate human uses of water according to how

Individual Level	Structural Level	Cultural Level
an unethical use of Traditional Knowledge by MCFN and ACFN. 3. Community Participants explained that, due to differences in the nature of Traditional Knowledge and Western Science, GoA and MCFN and ACFN mistrusted each other's knowledge, contributing to GoA's reluctance to use ANF to develop water withdrawal rules. 4. Community Participants described how the GoA's worldview, which contrasted with their own, fostered disconnectivity in five dimensions: waterscape fragmentation; jurisdictional fragmentation, especially around human wellness and water management; people-land disconnection; intergenerational fragmentation; and community-government divides. This worldview grounded in disconnectivity hid the full effects of oil sands water withdrawals from government representatives, downplaying the urgency underpinning the ANF. 5. To Community Participants, the GoA considered Indigenous peoples just one of many stakeholders instead of as rights holders that should have their priorities elevated over other regional interests. Since MCFN and ACFN found their status as stakeholders disrespectful, they engaged bilaterally with the GoA on the ANF. The bilateral interactions, perceived as appropriate by the MCFN and ACFN, were considered inappropriate by government representatives.	disrespectful engagement practices (carried out by third parties such as paid consultants or by staff without decision-making authority). Additionally, the use of allied western scientists sometimes resulted in mixed messages being delivered to federal and provincial governments by different MCFN and ACFN representatives and could reinforce federal and provincial government governments' perspective that Traditional Knowledge cannot be used unless mediated by Western Science. Due to these communications challenges, the GoA never fully understood the river navigability challenges faced by MCFN and ACFN and cooperative relationships needed to refine ANF could not be established. **Incentives** Not applicable. **Opening** To Community Participants, long-term polarized relationships and the GoA's refusal to discuss rights-related questions outside of formal court processes closed the political structure to comprehensive discussions on the full implications of reduced river navigability as perceived by MCFN and ACFN. **Resistance** To Community Participants, the GoA was resistant to policy changes that potentially could interfere with the wealth generated by sustained oil sands growth.	much they are to blame for the decline. The imposition of water withdrawal cut-off thresholds such as ANF was considered inappropriate under the GoA's cause-oriented freshwater management approach because the GoA could not confirm whether oil sands water withdrawals were impacting river navigability. 3. Some Community Participants explained that the geographic scope of the instream flow needs work changed over time, creating uncertainty in whether river navigability in the Athabasca River delta would be protected. **Legitimacy** Community Participants described feeling delegitimized by geography (beneficiaries of oil sands development live upstream while those most impacted live downstream), demography (Fort Chipewyan's small population), and the undervaluation of Traditional Knowledge by federal and provincial government representatives. The delegitimizing effects of demography, geography, and undervaluation of Traditional Knowledge manifested in the GoA placing little priority on meeting MCFN's and ACFN's needs.

Individual Level	Structural Level	Cultural Level
These five areas of inter-constellational incongruence caused the GoA to see river navigability as a nonurgent issue that could not be used to set water withdrawal rules until evidence derived from quantitative Western Scientific data demonstrates that surface mineable oil sands water withdrawals are causing river navigability to decline.		

6.1.1 Keystone Factors – Motivations at the Individual Level of the Implementing Innovation Framework

Motivation is the "stimulus that drives individuals to alter the status quo situation" (Steelman, 2010, p. 16). Individuals discontented with the status quo that are free to devise alternative solutions foster innovation. To Community Participants, two interacting motivations, one barrier and one facilitator, were the keystone factors explaining the incorporation of river navigability monitoring provisions in the SWQMFLAR. Specifically, Community Participants identified (1) *GoA's fear-based motivation as the keystone barrier* and (2) *MCFN's and ACFN's optimism-based motivation as the keystone driver*. The keystone barrier and driver are explained further below.

1. GoA's fear-based motivation as the keystone barrier: To Community Participants, GoA representatives' opposition to the use of ANF as proposed by MCFN and ACFN was motivated by fear: "all this is about fear" (Community Participant 23). According to Community Participants, GoA representatives feared MCFN and ACFN as threats to the wealth generated by oil sands mining because they mistakenly believed that the First Nations wanted to "shut down the oil sands" (Community Participants 4, 15, and 23). Community Participants attributed the GoA representatives' fear to the physical, emotional, and intellectual distance that GoA representatives kept between themselves and the citizenries of MCFN and ACFN.[44] The GoA's fear-driven distance from MCFN and ACFN was, as explained by Community Participants, exacerbated by the GoA's "[fear] of legal challenge by industry if they [GoA] don't do what they tell them" (Community Participant 23). The implication of the GoA's two-pronged fear is

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[44] GoA representatives maintained physical distance between themselves and MCFN and ACFN by "never com[ing] to Fort Chip[ewyan], spend[ing] time with the people or on the land" (Community Participant 17). GoA representatives maintained emotional and intellectual distance from MCFN and ACFN by remaining deeply unfamiliar with Indigenous peoples. Community Participants described how they have spent their lives learning the ways of government and Western Science, but representatives from all levels of government do not invest the same time and resources in learning the First Nations' ways except for superficial notions about Indigenous peoples having a special relationship with the environment (Community Participants 4, 11, 14, 22, and 26). Examples of how governments remained emotionally and intellectually distant from the First Nations included the contracting of third parties to engage with Indigenous peoples or seeking advice from internal non-Indigenous employees with "Indigenous expertise" rather than speaking directly with the Indigenous peoples (Community Participants 3, 4, 14, and 23).

that it prevented GoA representatives from working collaboratively with MCFN and ACFN: "they are afraid of so much that they can't open up and work with us" (Community Participant 22). By not working collaboratively, GoA representatives were, according to Community Participants 4, 22, 23, and 29, unable to understand MCFN's and ACFN's motivations, goals, and knowledge underpinning ANF, which in turn constrained how the GoA used the ANF in SWQMFLAR development.

2. MCFN's and ACFN's optimism-based motivation as a keystone driver: Community Participants 15, 17, 18, and 23 described how MCFN and ACFN Elders and leaders were motivated by optimism that in turn motivated GoA representatives, encouraging the GoA's use of ANF in SWQMFLAR development. To Community Participants, MCFN and ACFN Elders and leaders wanted to effect change for MCFN and ACFN citizens for two reasons: (i) their first-hand observations of extensive changes in the waterscape that contributed to the degraded wellness experienced by their citizens (see section 5.1); and (ii) their feelings of being patronized by federal and provincial government representatives who felt they knew what was best for the people of Fort Chipewyan (Community Participants 4, 10, 14, 16, 18, 30). To effect change, Community Participants explained that MCFN and ACFN Elders and leaders became skilled advocates, and that although at times "it was like beating [their] heads against the wall", MCFN and ACFN continue to have "just a little bit of hope" that drives them to continue "[being] loud" to have their voiced heard (Community Participant 18). Their optimism that changes will be effected, to Community Participants, has "rubbed off" on federal and provincial government representatives (Community Participant 22), helping GoA to partially overcome their fear-based motivation. Consequently, MCFN and ACFN "had a place at the table now to talk" (Community Participant 23) at which they were able to raise their river navigability concerns and introduce and promote ANF,

6.1.2 Individual Level Drivers

6.1.2.1 Motivation

Motivation facilitated the GoA's use of ANF in the SWQMFLAR as a keystone factor. See section 6.1.1 for further details.

6.1.2.2 Norms and Harmony

Innovations that preserve social norms and harmony in workplaces are more likely to be adopted (Steelman, 2010). In this case, Community Participants described two drivers related to norms and harmony: (1) *creating disharmony to effect change* and (2) *exercising creativity to advance interests*.

1. Creating disharmony to effect change: Community Participants described how MCFN and ACFN fostered disharmony amongst CEMA members to show that changes in the instream flow needs work were harmonious with one of CEMA's broader objectives. One of CEMA's objectives was to bring together Traditional Knowledge and Western Science for the management of the Lower Athabasca River, but to Community Participants 3, 4, 14, 17, 18, 22, and 23, non-Indigenous CEMA members in the early years were establishing criteria for the instream flow needs work based on only their perspectives about waterscape health and river uses. Non-Indigenous CEMA members "didn't ask the native people in that room when they used the river…or why they thought the river was dying" (Community Participant 22). By reminding non-Indigenous CEMA members that they "promised to listen to Aboriginal peoples" (Community Participant 18) and consistently correcting their assumptions, Community Participants were able to convince CEMA members to use different times of year in the analysis of impacts of oil sands water withdrawals to sensitize analyses to Indigenous river uses:

> So the critical time that Mikisew was raising…the most important time for navigation, for hunting…we got the issue known. It was huge…I think the Alberta Government took notice, I think oil sands operators took notice (Community Participant 23)

In short, Community Participants were able to alter analytical norms by showing non-Indigenous CEMA members that listening to Indigenous peoples fit within the cross-cultural collaborative culture that CEMA was intended to foster.

2. Capitalizing on creativity norms to advance interests: Community Participants described how employing creativity was an established norm for MCFN and ACFN to overcome obstacles that they experience in natural resource regulatory processes. The "amazing, creative innovative things [MCFN and ACFN have] and are doing" (Community Participant 3) included:

- Forming internal governance structures consisting of dedicated agencies responsible for gathering and sharing Traditional Knowledge and implementing directions from First Nations leadership in state government-led policy-making processes in Canada (Community Participants 3, 4, 14, and 15).

- Establishing a community-based monitoring program, including the use of creative communication and data collection tools accessible to river users, that complements, expands, and verifies government monitoring programs from an Indigenous standpoint (Community Participants 3, 15, 17, 21, and 24).

- Finding ways to bring together Traditional Knowledge and Western Science to communicate the two First Nations' conception of and mechanisms for achieving wellness through ANF in terms familiar to federal and provincial government representatives (Community Participants 3, 4, 15, 17, 23, and 24).

The three adaptations listed above were not established to only support the First Nations' participation in surface water quantity policy development. Rather, Community Participants contended that the three adaptations established over time the structural and processual supports needed by MCFN and ACFN to debate the place of river navigability in surface water quantity policy with federal and provincial government representatives and to develop and defend ANF (Community Participants 3, 14, 23). Thus, creative adaptation as a social norm on the part of MCFN and ACFN helped to increase the influence that the First Nations had during SWQMFLAR development so that their river navigability concerns were heard by federal and provincial governments.

6.1.2.3 Intra-constellational Congruence

Not applicable.

6.1.2.4 Inter-constellational Congruence

Inter-constellational congruence is achieved when the values represented by an innovation align with the values of the organization considering the innovation for adoption. Most Community Participants agreed with what they perceived as GoA's characterization of policy-making as a values-laden process inclusive of a broad range of social, economic, and

environmental goals. Community Participant 23 articulated this inter-constellational congruence on what was an appropriate approach to policy-making:

> water management framework also in [Alberta's and Canada's] view, and I support this, it has to incorporate social values, economic. They have to understand how much water does industry need. They need to understand what society needs in terms of the water and river…So they have to make a policy decision not just based on pure science but based on all these different pillars of sustainable development.

Community Participants wanted the GoA to be aware of this congruence so that the GoA would understand that the First Nations' objective was "not to stop the oil sands" (Community Participants 17 and 23). Community Participants believed that if the GoA understood that MCFN and ACFN supported the inclusion of economic goals in policy-making alongside environmental and social goals, then the GoA would no longer fear the First Nations' intentions and accept their invitation to collaboratively modify ANF. Underpinning the First Nations' invitation was willingness to compromise, which Community Participants perceived as vital to values-laden policy-making.

6.1.3 Structural Level Drivers

6.1.3.1 Rules

Rules facilitate adoption if they clearly support the innovation and the actions or expectations associated with the innovation (Steelman, 2010). In this case, Community Participants described two categories related to rules: (1) *taking advantage of formal state government engagement obligations* and (2) *being consistent with informal rules*.

1. Taking advantage of formal state government engagement obligations: Community Participants partially attributed the GoA's inclusion of river navigability in the SWQMFLAR to evolving rules that require federal and provincial governments to engage with Indigenous peoples. Examples of rules affecting how federal and provincial governments engage with MCFN and ACFN that the Community Participants identified are the following:[45]

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[45] Community Participants referred to the laws and policies identified in the three bullets using colloquialisms that were not clear in quotes. For example, *Mikisew Cree First Nation v. Canada* was referred to by some Community Participants as "our court case". To more clearly convey the examples raised by Community Participants, I included

- Subsection 35(1) of the *Constitution Act, 1982* recognizes and affirms existing Aboriginal and treaty rights, a consequence of which is that treaty rights can no longer be unilaterally altered by either provincial or federal governments (Community Participants 3, 23; Isaac & Annis, 2010).
- Common law clarified the existence of procedural rights associated with Treaty No. 8 such as consultation in *Mikisew Cree First Nation v. Canada (Minister of Canadian Heritage), 2005* (Community Participants 14, 23, and 29; Isaac & Annis, 2010).
- The GoA made policy commitments to consult with Indigenous peoples on land and water use (e.g., Lower Athabasca Regional Plan, Water for Life Strategy) (Community Participants 14 and 22).

To Community Participants, the above listed legal rules and policy commitments created an opportunity for the First Nations to introduce their river navigability interests into the policy-making process and to have the GoA take those interests seriously.

2. Being consistent with informal rules: Community Participants explained that MCFN and ACFN paid close attention to informal rules when developing ANF. Informal rules consisted of the approaches, practices, and timeline commitments to establishing the instream flow needs and water withdrawal rules that emerged as CEMA members interacted during Phases 1 and 2 of the policy-making process. The term "informal" is to distinguish them from laws and policies issued by state governments. Specifically, Community Participants described how MCFN and ACFN aligned ANF development with the (i) approach to setting water withdrawal rules established in Phases 1 and 2 of the policy process (see section 4.2.5.2; Community Participants 3, 18, 21, 23); and (ii) the timelines established by the GoA (Community Participants 3, 18, 21, 23). According to Community Participants, MCFN and ACFN were careful to follow these informal rules when they were preparing the ANF so that their information could be more easily understood and readily acted upon by federal and provincial governments.

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formal references to the laws and policies in the rules section using Isaac and Annis (2013) where needed. The Indigenous research partners confirmed that these were the laws and policies referred to colloquially by Community Participants. Also, a comprehensive list of all rules affecting consultation obligations under Treaty No. 8 is not provided because that outside the scope of this research.

6.1.3.2 *Communications*

Communications refer, in part, to information exchange, interactions, and relationship building between people to enable a clear understanding of the nature and operationalization of an innovation (Steelman, 2010). When communications are clear or interactions cooperative, innovations are more likely to be adopted (Steelman, 2010). In this case, Community Participants described how MCFN and ACFN combined externally and internally directed communications strategies to increase their influence in regional natural resource management generally and freshwater policy-making specifically. According to Community Participants, the external communications strategies, which are presented below, strived to raise public and government awareness of the rights and challenges faced by MCFN and ACFN, build relationships with regional actors, and convey their interests in terms familiar to government representatives:

- letter writing campaigns (Community Participants 3, 18, and 23), press releases from Chief and Council (Community Participant 23), and endorsement by actors and musicians (Community Participants 3, 13, 14, 16, 17, 18, 23, and 29) to sharpen the media's attention on the impacts of the oil sands being experienced by downstream Indigenous peoples. Media attention raised public awareness which in turn increased the "pressure on both the provincial, federal government" (Community Participant 23). Expanding the issue in this way was to counteract what Community Participants described as industry's unfair access to governments: "we knew that industry was heavily lobbying them and we wanted the same possibility" (Community Participant 23).

- treating conversations with federal and provincial government representatives as educational opportunities so that federal and provincial government would better understand the First Nations' values, interests, interpretations of Aboriginal and treaty rights, and preferences for community engagement (Community Participants 3, 14, and 18).

- bi-lateral relationship building outside of government surface water quantity policy-making to find common ground amongst other agencies with interests in the region (Community Participants 18 and 23).

- engaging independent scientific experts to facilitate conversations with federal and provincial government scientists because their similar training "allowed them to speak the same language" (Community Participants 3, 14, 15, 23, and 24).

According to Community Participants, the above listed external communications strategies were bolstered by internal communications efforts between MCFN and ACFN. Community Participants reported that MCFN and ACFN internally:

- cooperated, found common ground in their concerns about and preferred solution for river navigability, and made the deliberate decision to present a unified front to government around river navigability (Community Participants 3, 18, and 23; Candler et al., 2010).

- trusted the knowledge held by their citizens (Community Participants 3, 4, 14, 15, 17, 18, 22, 23, 24, and 29).

To the Community Participants, the external communications strategies created more equitable consultation processes with federal and provincial governments while the internal communications processes provided a sense of pride and strengthened community voices around river navigability. Community Participants attributed their multipronged communications efforts as the most significant factor in having river navigability addressed in the SWQMFLAR (Community Participants 3, 4, 14, 15, 17, 18, 22, 23, 24, and 29).

6.1.3.3   Incentives

Incentives can alter the cost-benefit calculus in favour of innovation adoption (Steelman, 2010). MCFN and ACFN were provided funding through a consultation agreement with GoA and the federal government to support development of ANF, but Community Participants 18 and 23 reported that this funding was not considered a vital factor in advancing river navigability protections.

6.1.3.4   Opening

An open political structure allows marginalized groups to foster change (Steelman, 2010). Community Participants acknowledged that in the 1990s, the GoA adopted a shared stewardship model for freshwater resources in the Lower Athabasca River region, which "made a seat at the

[CEMA] table for [MCFN and ACFN]" (Community Participant 18). However, Community Participants 18 and 22 argued that their "seats" were tokenistic, and that the little influence that MCFN and ACFN did have within CEMA was due to the First Nations "fighting hard for it" (Community Participant 22). According to Community Participants, MCFN and ACFN used their influence to raise river navigability as an issue alongside other Indigenous members of CEMA, but they could not convince the GoA that monitoring impacts of water withdrawals on river navigability did not address the urgency of the river navigability problem (Community Participants 3, 14, 18, 23). To Community Participants 3, 14, 18, and 23, oil sands water withdrawals needed to cease when river flows were low. In sum, the political structure was partially open to provide MCFN and ACFN with an opportunity to have river navigability formally monitored through the SWQMFLAR, but MCFN and ACFN experienced challenges with having water withdrawal cut-off thresholds based on ANF imposed oil sands industry-wide.

6.1.3.5   Resistance

Not applicable.

6.1.4 Cultural Level Drivers

6.1.4.1   Shocks

Shocks are described by Steelman (2010) as catalytic events that create opportunities for innovation to occur. Community Participants 4, 14, 15, 17, 18, 22, 23, and 29 explained that upstream development on the Peace and Athabasca Rivers and MCFN's and ACFN's experiences with CEMA created a sense of urgency amongst MCFN and ACFN citizenries[46] to have federal and provincial government representatives recognize poor river navigability as a

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[46] The shocks that created a sense of urgency amongst MCFN and ACFN citizens were identified by Community Participants as consisting of (i) construction of the W.A.C Bennett Dam on the Peace River in the late 1960s that "made the [Peace-Athabasca] delta dry out" (Community Participants 2, 4, 14, 17, and 22); (ii) development of the oil sands on the Athabasca River that was described as "poisoning the fish, air, the animals, water" (Community Participant 4) (Community Participants 2, 4, 6, 11, 14, 16, and 22); (iii) lack of consideration of Indigenous river uses in CEMA's early work to determine the instream flow needs of the Lower Athabasca River, which Community Participant 18 expressed as "[GoA] didn't even think about the people living on the river, they only thought about fish"; and (iv) the categorization river navigability as a knowledge gap at the end of the second phase of the policy process leading to the SWQMFLAR (Community Participants 3, 18, and 23).   and (iii) human injuries and equipment damage sustained in boating accidents involving MCFN and ACFN citizens.

real problem their citizens experience. However, that sense of urgency "came to a head" (Community Participant 14) after a series of boating accidents on the Lower Athabasca River involving MCFN and ACFN citizens that Community Participants attributed to low river flows in the Lower Athabasca River (Community Participants 4, 14, 15, 17, 18, 22, 23, and 29). To Community Participants, the boating accidents were catalytic events that should foster change in the rules for industrial water withdrawals from the Lower Athabasca River. For example, Community Participant 18 described how MCFN and ACFN showed pictures of the injuries that people sustained in the boating accidents to federal and provincial government representatives, "[thinking] how could anyone see that and not want to do something about it" (Community Participant 18). In short, boating accidents acted as shocks, renewing MCFN's and ACFN's determination to have river navigability protected through the SWQMFLAR.

6.1.4.2   Framing

Framing refers to how situations are understood, which can condition people's responses to a situation (Steelman, 2010). Community Participants described how MCFN and ACFN were successful in shifting how CEMA framed the relationship between social, cultural, environmental, and economic goals. Initially, CEMA was described by Community Participants 18 and 22 as prioritizing economic and environmental goals over social and cultural goals because social and cultural goals were thought to be achieved through a robust economy and functioning aquatic ecosystems. Community Participants described how MCFN and ACFN partially disagreed with this characterization and asserted that their social and cultural goals needed to be understood as related to but separate from regional economic and environmental goals (Community Participants 3, 4, 14, 16, 17, 18, 22, and 23). The implications of defining cultural and social goals as distinct from but related to economic and environmental goals was that surface water quantity policy had to explicitly consider a broader range of interests that "were not very comfortable to the scientists in the room" (Community Participant 4).[47] Despite their initial discomfort, Community Participants observed that CEMA members over time redefined the relationship between social, cultural, economic, and environmental goals,

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[47] Community Participants described how MCFN's and ACFN's goals addressed their physical, intellectual, financial, environmental, emotional and spiritual needs that contributed to the wellness of their citizens individually and collectively (see Figures 5.1 and 5.2; Community Participants 3, 4, 14, 16, 17, 18, and 23).

broadening policy-making to include river navigability objectives (Community Participants 18 and 23).

6.1.4.3 *Legitimacy*

Legitimacy refers to the status of an organization, and innovations that are perceived as enhancing an organization's legitimacy are more likely to be adopted (Steelman, 2010). Community Participants asserted that Indigenous river navigability and ANF were "prominently displayed" (Community Participant 3) in the SWQMFLAR because the GoA wanted to appear responsive to Indigenous peoples' interests to legitimize it's regulation of oil sands mining. The GoA was described by Community Participants as being preoccupied with legitimacy to secure continued investments in oil sands developments:

> "[O]il sands are getting a bad rep[utation] and the government needs to look like it is doing something about it [to secure] investment from foreigners on trust that the environment's protected" (Community Participant 18)

Community Participants did not express any concerns regarding the GoA's desire for enhanced legitimacy. Indeed, Community Participants 3, 14, 18, 23, and 29 described how they deliberately designed communication strategies to place public pressure on the GoA to use ANF in surface water quantity policy. The problem, to Community Participants 3, 14, 18, 21, and 23, was that the GoA was able to *appear* responsive without changing oil sands water withdrawal rules in ways that would meet MCFN's and ACFN's interests:

> "there were substantive changes [made to the SWQMFLAR by the GoA] but they were designed such that the outcome for water withdrawals was unchanged" (Community Participant 21).

Stated differently, to Community Participants, the GoA's insincere enhancement of its legitimacy created opportunities for MCFN and ACFN to share their interests, but not to effect policy change in ways that were meaningful to them.

6.1.5 Individual Level Barriers

6.1.5.1 Motivation

Motivation was a keystone barrier that limited the use of ANF in the SWQMFLAR. See section 6.1.1 for further details.

6.1.5.2 Norms and Harmony

Norms and harmony refer to the social norms and desire to preserve harmony in workplaces (Steelman, 2010). Innovations that maintaining norms and harmony are likelier to be adopted (Steelman, 2010). To Community Participants, the lack of creativity, expressed as "can't think out of the box" (Community Participant 3), as a social norm within the GoA constrained the GoA's ability to evaluate ANF as a viable policy solution.[48] Exercising creativity was understood by Community Participants to be difficult for government representatives because of their culture of:

- risk aversion expressed by Community Participant 3 as "unwilling to take a chance".
- lack of accountability expressed by Community Participant 23 as "they have the understanding that they can get away with doing nothing".
- complexity avoidance expressed by Community Participant 10 as "they can't deal with complicated things".

The implications of a lack of creativity within the GoA identified by Community Participants 3, 14, 18, and 23 were two-fold: (i) constrained problem solving out of which could emerge mutually acceptable ideas for meeting industry freshwater needs and protecting river navigability during periods of low river flow; and (ii) reliance on standard engagement techniques (e.g., written exchanges and business meetings) by federal and provincial government representatives instead of building cooperative, symbiotic partnerships that engage the wider Fort Chipewyan

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[48] Community Participants expressed the need to show gratitude to "some shining examples" (Community Participant 3) of federal and provincial government representatives who sincerely attempted to understand and assist MCFN and ACFN in finding mutually acceptable solutions for river navigability. However, Community Participants 3, 18, 22, and 23 were concerned that the efforts by the "shining examples" to find mutually acceptable solutions "were muzzled or prevented from doing further action from other people higher up in the chain" (Community Participant 18), especially if the solutions would interfere with existing allocations in water licenses held by oil sands companies.

community. Community Participants were concerned that, by relying on standard engagement techniques, the GoA could not appreciate how urgent of a problem river navigability was to MCFN and ACFN citizens. Due to these implications of a lack of creativity, collaboration between MCFN and ACFN and the GoA "got worse in never ending loop" (Community Participant 18) until "relationships were quite dead in the water" (Community Participant 3). In short, to Community Participants, the GoA's inability to be creative eroded relationships with MCFN and ACFN such they could not collaborate to find mutually acceptable ways of using ANF.

6.1.5.3   *Intra-constellational Congruence*

Not applicable.

6.1.5.4   *Inter-constellational Congruence*

Inter-constellational congruence refers to the degree of alignment in the values represented by an innovation and the values of an organization that is considering innovation adoption. Innovations are likelier to be adopted when there is inter-constellational congruence. Community Participants identified five types of incongruence that to them affected the GoA's use of ANF and how GoA and MCFN and ACFN interacted over ANF, including (1) *incongruent ideas about Indigenous resource use patterns,* (2) *incongruent views on ethical use of Traditional Knowledge,* (3) *incongruent perspectives on the comparative value of Traditional Knowledge and Western Science,* (4) *incongruent views on (dis)connectivity,* and (5) *incongruent views on the participation status of Indigenous peoples.* These five areas of inter-constellational incongruence are explained further below.

1. Incongruent ideas about Indigenous resource use patterns: The first incongruence identified by Community Participants was differences in how Indigenous and Western Science-based water managers organize and use with the waterscape, which contributed to the GoA's misunderstanding of why the adoption of ANF was urgent. To Community Participants 2, 14, 22, 23, and 29, the GoA appeared to assume that MCFN and ACFN "had nothing to complain about" (Community Participant 23) because there was still freshwater in parts of their waterscape that supported hunting, trapping, and fishing. Using hand drawn sketches, Community

Participant 23 explained that the GoA's assumption was false because families had their own territories within the broader waterscape that were breaking down as families with "dried-out" territories moved into territories with freshwater, increasing competition for country foods and eroding social customs such as food sharing (also see section 5.1.1.2). Community Participant 23 also explained that there are areas where families would come together to fish, hunt, or celebrate that they cannot access any longer. Community Participant 23 wanted the GoA to understand that MCFN and ACFN citizens do not use all parts of the waterscape in the same way and that the presence of river flows in one part of the waterscape does not provide sufficient access to hunting, trapping, and fishing grounds to meet the needs of river users from Fort Chipewyan. Community Participants 2, 14, 22, 23, and 29 contended that until the GoA understands how MCFN and ACFN organize and use their waterscape, the GoA will not be able to understand the urgency underpinning ANF.

2. Incongruent views on ethical use of Traditional Knowledge: The second incongruence identified by Community Participants were differences in perspectives on the ethical use of Traditional Knowledge held by MCFN and ACFN and GoA, which, to Community Participants 3, 14, 18, 21, and 23, resulted in ineffective river navigability protections being incorporated into the SWQMFLAR. Most contentious to Community Participants was the flow rate at which river navigability was considered impossible (the zero point) in the SWQMFLAR. In the *As Long as the Rivers Flow Report*, MCFN and ACFN identified the zero point as 400 m^3/s measured at *Hydrometric Station 07DA001-Athabasca River Below Fort McMurray*, but the GoA appeared to arbitrarily use a zero point of 300 m^3/s instead when deriving the Aboriginal Navigation Index:[49]

> everybody knew the number was 400, no one was ever talking 300, the day that the Surface Water Quantity Management Framework went in, all of a sudden there's this 300 number in there. And it's like, how the hell did you get that number, like everyone's been talking 400. We suggested it's higher now and they got it set in policies as 300. So, it's just, these are things that infuriate (Community Participant 3)

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[49] When the SWQMFLAR was released, the implications of changing the zero point to 300 m3/s were not known in terms of changes in river depths at critical pinch points in the Lower Athabasca River.

Reducing the zero point[50] without the involvement of MCFN and ACFN was considered by Community Participants to be an unethical use of Traditional Knowledge: "it was them telling us they know the water levels we need better than we do" (Community Participant 14). To Community Participants 3, 14, 18, and 23, the change in zero point was a way to "mathematically explain away the navigation problems caused by the oil sands" (Community Participant 3) so that the GoA could justify meeting their economic goals for oil sands mining.

3. Incongruent perspectives on the comparative value of Traditional Knowledge and Western Science: The third incongruence identified by Community Participants was differences in how MCFN and ACFN and federal and provincial governments perceived their respective knowledge systems, causing federal and provincial governments to be skeptical about the reliability of ANF. Community Participants differentiated Traditional Knowledge data and Western Science data on how directly the data were collected by the person sharing the information. Traditional Knowledge holders were those individuals that gained their knowledge through direct and ongoing interactions with the world around them in accordance with the "unspoken laws" governing interactions between all that makes up Creation (Community Participants 14, 22, and 26). Conversely, federal and provincial government representatives were perceived by Community Participants as valuing remotely collected and modelled data, described "cold data", to understand the conditions of the world around them (Community Participants 17 and 24). Community Participants explained how GoA's cold data contradicted Indigenous river users' assertions that mineable oil sands water withdrawals caused river navigability to decline, which fostered mutual mistrust in each other's knowledge (Community Participants 14, 17, 24, and 29). To Community Participants, the GoA's mistrust in Traditional Knowledge contributed to their refusal to impose industry-wide water withdrawal cut-off thresholds.

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[50] Some community Participants explained that the arbitrary reduction in the zero point was hurtful to MCFN and ACFN because of the meaning that some Community Participants attached to the numeral zero. Determining the instream flow needs and establishing water withdrawal rules were grounded in the notion that there exists a river flow above which the aquatic ecosystem will remain healthy and below which the aquatic ecosystem is impaired. The purpose of determining this threshold flow was to determine how much freshwater could be withdrawn from the Lower Athabasca River to support mineable oil sands development. This same approach was applied to river navigability, and so the GoA needed to know when river navigability was impossible or at zero to establish river navigability provisions in the SWQMFLAR. Some Community Participants viewed this approach as inappropriate because "why would you measure from zero, zero means death, you don't wait until death to stop doing anything" (Community Participant 4). As part of their efforts to ensure their submissions to the GoA were immediately useable, some MCFN and ACFN citizens set aside their understanding of zero and incorporated the Western Science notion of zero as a baseline point into the AXF. The GoA's adoption of a different zero point suggested to some Community Participants that the GoA did not recognize the concessions that some Community Participants made so that ANF could be prepared in a format useable by the GoA.

4. Incongruent views on (dis)connectivity: The fourth incongruence identified by Community Participants related to five types of disconnectivity that, to Community Participants, prevented the GoA from understanding the full impact of oil sands mining on the environment and downstream communities. Since the GoA did not perceive river navigability as an urgent issue, river navigability monitoring provisions were included in the SWQMFLAR rather than water withdrawal limits based on ANF. The five types of disconnectivity, including *waterscape fragmentation*; *jurisdictional fragmentation*; *people-land disconnection*; *intergenerational fragmentation*; and *community-government divide*, are described below:

- *Waterscape fragmentation* encompassed the different ways that the waterscape is broken up for science-based management purposes, including compartmentalization of different parts of the hydrosphere (e.g., separating groundwater from surface water), separating water quality from water quantity, and separating river mainstems, tributaries, distributaries and lakes (Community Participants 14, 17, 18, 22, and 24). Fragmenting the waterscape prevents "all of us from understanding how healthy the water is because all water is connected" (Community Participant 22).

- *Jurisdictional fragmentation* was, to Community Participants, federal and provincial governments' separation of human wellness, including spirituality, from river navigability, which is diametrically opposed to MCFN's and ACFN's view that human wellness is explicitly and intimately linked to surface water quantity management:

  > because of those jurisdictional divisions, we're talking about navigation, we're not talking about health. And environmental assessments do that too. It's like well we're talking about contaminants of fish, we're not talking about people's spiritual connection, but it's all linked for them. You're trying to show that there needs to be a different kind of place for consideration of significance of impacts (Community Participant 3)

  Jurisdictional fragmentation constrains the ability of collaborative groups like CEMA from understanding how people are affected by freshwater management: "we don't talk about how people are in the meetings, we talk about fish and the little bugs…they forget that people's health is important too" (Community Participant 17).

- *People-land disconnection* refers to federal and provincial government representatives' conceptions of water as a non-living entity separate from humans. Community Participant 4 described his intimate connection with the land as an Indigenous person:

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"Everything is living, the animals, the water, the rocks and it's inside me too. That is what [Indigenous] people see". He then goes on to describe the connection that people living in cities have with the land "them in their concrete buildings they just see they can take from here, I guess it doesn't bother them inside because they forget, they are part of nature". When "people don't respect the land as part of them, they get greedy" (Community Participant 17), causing them to harm the waterscape without realizing that is what is happening (Community Participants 2, 4, 14, 17, and 24).

- *Intergenerational fragmentation* was caused by short freshwater management planning horizons that do not account for the needs of far off future generations (Community Participants 2, 11, 22, and 26). Some Community Participants recommended that all decisions should have a planning horizon equivalent to seven generations such as Community Participant 17 who stated that "we need to think about seven generations, keep seven generations in mind in everything that we do because I want my great grandchildren to see what I see and be on the river just like I am today". Long planning horizons would ensure that the waterscape was used respectfully (Community Participants 2, 4, 14, 17, 24, and 29).

- *Community-government divide* referred to the lack of familiarity and understanding that existed between the people of Fort Chipewyan and government representatives that prevents them from working together to protect the waterscape (Community Participants 2, 4, 11, 14, 15, 17, and 24).

5. Incongruent views on the participation status of Indigenous peoples: The fifth incongruence identified by Community Participants were MCFN's and ACFN's and GoA's different standpoints on the status of Indigenous peoples in collaborative groups. Community Participants 3, 14, 18, 22, 23, and 29 reported that Indigenous peoples were engaged by federal and provincial governments as stakeholders rather than as rights-holders during the development of the SWQMFLAR. Community Participants described how treating all participants as equals may seem fair, but that this type of participation status failed, in their opinion, to recognize that Indigenous rights-holders hold senior priority because they existed long before Suncor and Syncrude (Community Participants 3, 4, 14, 17, 22, 23, and 29), and that treaty First Nations hold special status as sovereign nations that entered into a relationship with Canada as equals

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(Community Participants 22, 23, 26, and 29). In response to being treated as stakeholders, according to Community Participants, MCFN and ACFN initiated bilateral interactions with the GoA about their freshwater interests instead of participating in CEMA. To Community Participants, the bilateral interactions were appropriate given the treaty relationship, but they believed that the GoA preferred that MCFN and ACFN participate in CEMA. Due to their different perspectives on the appropriateness of bilateral interactions, Community Participants explained that their interactions with the GoA were strained, and thus, remained more about information exchange than collaboration: "they didn't like that we left CEMA and getting past just talking about the bare minimum was hard but we felt we had no choice but to leave" (Community Participant 18).

6.1.6 Structural Level Barriers

6.1.6.1   Rules

Rules provide top-down support for and expectations around innovations (Steelman, 2010). Unclear, absent, or differently interpreted rules can impede the adoption of innovations (Steelman, 2010). Community Participants raised three barriers related to rules, including (1) *narrow scope of the federal Navigable Waters Protection Act in force during SWQMFLAR development,* (2) *uncertain rules about the imposition of water withdrawal cut-off limits on senior licensees*, and (3) *unresolved questions on Aboriginal and treaty rights-based* that shaped how ANF were used in SWQMFLAR development as described below.

1. Narrow scope of the federal Navigable Waters Protection Act in force during SWQMFLAR development: Community Participants described how the narrow scope of the federal *Navigable Waters Protection Act,* as it was titled during SWQMFLAR development, constrained the avenues they had for having their river navigability concerns addressed. Community Participants explained that MCFN and ACFN met with the federal agency, Transport Canada, to discuss their river navigability concerns because navigation was federal jurisdiction under section 91(10) of the *Constitution Act*, and Transport Canada was the agency responsible for administering the then titled *Navigable Waters Protection Act.* According to Community Participants, Transport Canada agreed to undertake studies of the navigability of the Lower

Athabasca River, but the agency also indicated that their authority to address MCFN's and ACFN's concerns were limited by section 5(1) of the *Navigable Waters Protection Act:*

> 5(1) No work shall be built or placed in, on, over, under, through or across any navigable water without the Minister's prior approval of the work, its site and the plans for it.

According to Community Participants, Transport Canada explained to MCFN and ACFN that under section 5(1) they could not address impacts on river navigability caused by water withdrawals from a navigable water; Transport Canada could only address impacts on river navigability caused by the building of works and fill placement. Since ANF were proposed as rules for water withdrawals and not building works or fill placement, Transport Canada, according to Community Participants, did not become involved in SWQMFLAR development. Consequently, as explained by Community Participants, MCFN and ACFN had to rely on provincial authorities to address their river navigability concerns even though navigation was the responsibility of the federal government.

2. Uncertain rules about the imposition of water withdrawal cut-off limits on senior licensees: Community Participants described how the applicability of legal and policy mechanisms for imposing water withdrawal cut-off limits on senior licensees was controversial throughout policy-making, constraining the type of oil sands water withdrawal rules that would be considered. Community Participants 3 and 23 pointed to clause 5 in Syncrude's License No. 07921 and clause 10 in Suncor's License 10400 which to them indicated that water withdrawal cut-off limits could be imposed on senior licensees:

> The Controller of Water Resources may designate a minimum residual flow rate immediately downstream of the point of diversion and the licensee shall be required to cease or reduce any further diversion during periods when the residual flow falls below the rate designated.

I sought clarification on the interpretation and application of these clauses from Alberta Environment and Parks on June 19, 2017, but to date no response has been received. In the SWQMFLAR, the GoA referred to the statutory priority given to senior licensees and addressed the possibility of amending water withdrawal rates by stating that "there are provisions in the *Water Act* that would allow the Minister of Environment and Sustainable Resource Development to address issues in an emergency" (GoA, 2015, p. 62). Conditions or situations that constitute an emergency were not identified in the SWQMFLAR. Providing an analysis of whether water

withdrawal cut-off limits may be imposed on senior licensees in emergency or non-emergency situations is outside the scope of this thesis, but, to Community Participants, the GoA interpreted the *Water Act* to mean that they could not require senior licensees to cease all water withdrawals at a particular threshold because an emergency was not being experienced:

> they [the GoA] have the power to do what they like, they ignored our legal arguments and didn't put [water withdrawal] limits on the senior companies even during low flows because they don't see the low water (Community Participant 22).

In keeping with its interpretation of the *Water Act*, the GoA, according to Community Participants, did not include MCFN's and ACFN's AXF as an industry-wide water withdrawal cut-off threshold in the SWQMFLAR.

3. Unresolved questions on Aboriginal and treaty rights-based: Community Participants explained that ANF were rights-based river flows, but that questions about the nature and extent of Aboriginal and treaty rights (e.g., Aboriginal rights to water; ancillary rights associated with Aboriginal ways of life) strained relationships between MCFN and ACFN and federal and provincial governments (Community Participants 2, 3, 4, 11, 14, 15, 17, 18, 22, 23, 24, 26, 29). An examination of Aboriginal and treaty rights as they relate to river navigability and freshwater is outside the scope of this thesis, but as Community Participants explained, different interpretations of Aboriginal and treaty rights amongst MCFN and ACFN and federal and provincial governments manifested in different ideas about appropriate water withdrawal rules. For example, Community Participants 2, 3, 4, 11, 14, 15, 17, 18, 22, 23, 24, 26, 29 asserted that the imposition of industry-wide water withdrawal cut-off thresholds were appropriate because MCFN and ACFN "were here first", and therefore, senior to the water rights held by oil sands companies. However, according to Community Participants, federal and provincial governments disagreed with MCFN and ACFN and refused to impose industry-wide water withdrawal cut-off thresholds because "they think that we [MCFN] and [ACFN] gave up the land and the water" (Community Participant 22). These tensions caused by different understandings of Aboriginal and treaty rights eroded relationships between MCFN and ACFN and federal and provincial governments, constraining their ability to work collaboratively to modify ANF in mutually acceptable ways.

6.1.6.2   *Communications*

Communications refer to information exchange, interactions, and relationship building between people to enable a clear understanding of the nature and operationalization of an innovation (Steelman, 2010). When communications are unclear or interactions are difficult, innovations are less likely to be adopted (Steelman, 2010). Community Participants described three communications challenges that disrupted information exchanges needed for MCFN and ACFN to fully convey and for the GoA to understand MCFN's and ACFN's river navigability interests, including (1) *constrained engagement pathways*, (2) *misaligned internal and external engagement pathways*, and (3) *use of western scientists to mediate Traditional Knowledge.*

1. Fractured engagement pathways: Community Participants indicated their appreciation for the willingness of some government representatives to cooperatively communicate with MCFN and ACFN about river navigability, but they also indicated that staffing patterns within federal and provincial governments hindered them from developing trust-based relationships needed to refine ANF to their mutual benefit. First, high staff turnover within federal and provincial governments means that MCFN and ACFN often have to repeat their information and federal and provincial government representatives are not able to deepen their knowledge of MCFN's and ACFN's interests: "there's so much turnover in staff…You have to retell the story over again. It's just not helping us" (Community Participant 18). Second, federal and provincial government representatives with little decision-making authority engage with MCFN and ACFN, which slowed policy-making: "junior people talk to us…but when we ask questions like what will change…they say they can't make that decision and will talk it with their boss but then we never see them again and nothing changes…people who make decisions need to come talk to us so that things get done faster" (Community Participant 4). Community Participants 14, 15, 18, and 23 explained that slow policy-making burdens MCFN's and ACFN's limited resources, constraining how much they can work directly with federal and provincial governments to find mutually acceptable solutions. In short, according to Community Participants, MCFN and ACFN were fatigued by high federal and provincial government staff turnover and the lack of decision-making authority held by federal and provincial governments representatives, which was not conducive to the long-term cooperation needed to refine the ANF in mutually acceptable ways.

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2. Disrespectful engagement: Community Participants 3, 4, 14, 17, 18, 23, 24, 26, and 29 explained that their relationships with federal and provincial government representatives remained superficial because federal and provincial government engagement practices were considered disrespectful. Community Participants 3, 4, 14, 17, 18, 23, 24, 26, and 29 described how federal and provincial government representatives rarely spent time in Fort Chipewyan or on the water with Traditional Knowledge holders[51], often used consultants to engage with MCFN and ACFN, and often used unfamiliar language during discussions. Together, these federal and provincial government engagement practices, according to Community Participants, prevented the GoA from understanding why river navigability was a priority for MCFN and ACFN.

3. Using western scientists to mediate Traditional Knowledge: Some Community Participants expressed concerns that using allied western scientists to communicate MCFN's and ACFN's interests distorted perspectives and meanings of Traditional Knowledge. To some Community Participants, using allied western scientist to prepare and promote ANF reinforced federal and provincial government perspectives that Traditional Knowledge can only be used in freshwater governance arenas if mediated through Western Science: "scientists are brought in by Chief and Council to help us, but Elders speak for us…so government people might think our Elders' knowledge is not good enough by itself" (Community Participant 14). Other Community Participants indicated that allied western scientists sometimes misunderstood "what the people were saying" (Community Participant 29). For example, Community Participant 17 explained that arguing for the use of the AXF as a minimum flow went against some Elders' perspectives that "people should be asking how much [water] do we really need instead of how much can the water be destroyed before a problem happens?" (Community Participant 17). The Community Participants who raised concerns about using allied western scientists did not want the practice to stop because they perceived allied western scientists as more helpful than harmful. However, the Community Participants believed that the problems with using allied western scientists weakened MCFN's and ACFN's position on river navigability in some meetings with state governments when the Elders and scientists communicated different messages.

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[51] Many Community Participants mentioned that Parks Canada is an exception as there are Parks Canada staff living in Fort Chipewyan.

6.1.6.3   Incentives

Not applicable.

6.1.6.4   Opening

Opening refers to the ability of marginalized groups to foster change within the existing political structure (Steelman, 2010). When political structures are closed, change is less likely (Steelman, 2010). Characterized as "silly game[s]" and "picking at each other" (Community Participant 18), interactions between GoA and MCFN and ACFN, according to Community Participants, had long been adversarial, limiting the influence that MCFN and ACFN had on SWQMFLAR development. To Community Participants, their adversarial relationships were caused by but also led to the GoA's insincere attempts to seek out and understand Traditional Knowledge: "so it's more like a checkmark on a page versus really listening to it [Traditional Knowledge]" (Community Participant 22). Some Community Participants perceived insincere engagement as a deliberate tactic by the GoA to close SWQMFLAR development to Traditional Knowledge while still appearing to meet its legal obligations to consult with the First Nations.

Community Participants also explained that SWQMFLAR development was closed to explicit discussions about the nature and extent of Aboriginal and treaty rights. Community Participants explained that ANF attempted to foreground treaty rights and the responsibilities of MCFN and ACFN and federal and provincial governments towards each other as treaty partners in SWQMFLAR development. However, according to Community Participants, GoA representatives refused to discuss rights with MCFN and ACFN and directed them to take court action to resolve disagreements about the nature and extent of their rights. Community Participants perceived the separation of rights-based discussions from the setting water withdrawal rules as flawed because how freshwater is managed affects how treaty rights can be exercised and in turn the wellness of MCFN and ACFN citizens (see section 5.1.2). Further, Community Participants saw the GoA's reliance on the courts as a harsh shut down that eroded already strained relationships between the First Nations and the GoA:

> so everything Alberta seems to do has been as a result because we have to force them to legally. So yeah, how can you develop a relationship with somebody when - any relationship with someone when you're just forcing them to?

In short, to Community Participants, discussions closed to the intersection of rights and freshwater management damaged their relationships with the GoA and prevented the GoA from understanding the urgency underpinning ANF.

6.1.6.5   Resistance

Resistance refers to inertia created by vested interests that seeks to preserve the status quo (Steelman, 2010). The greater the resistance, the less likely an innovation will be adopted (Steelman, 2010). Community Participants perceived the GoA as resistant to policy solutions that interfered with the economic security provided by the oil sands:

> We ask these questions, explain to us why are you are you ignoring us? Why are you not incorporating this [ANF]? So they can't answer that…a lot of it is because their whole motive all along is to support oil sands development, that's their priority. So anything that interferes with that or anything that will allow that to not progress forward is doesn't matter to them (Community Participant 23)

> It's all about money, making them afraid to admit how bad it is for us guys down river from the mines (Community Participant 22)

Community Participants contended that since ANF included an industry-wide water withdrawal cut-off threshold, the GoA was unwilling to adopt ANF as proposed by MCFN and ACFN.

6.1.7 Cultural Level Barriers

6.1.7.1   Shocks

Not applicable.

6.1.7.2   Framing

Framing refers to the ways in which problems are defined or situations explained, prompting action to be taken (Steelman, 2010). Community Participants described how three frames, including (1) *changed versus changing waterscape*, (2) *cause versus problem oriented water management*, and (3) *narrowed geographic scope of policy-making,* shaped the GoA's use of ANF as explained below.

1. Changed versus changing waterscape: To Community Participants, the GoA's terminology choices when describing the status of the waterscape suggested they have a different understanding of the nature and urgency of the water policy problem underpinning SWQMFLAR development. Community Participants described how GoA representatives used the word "changing" to describe the status of the waterscape in the Lower Athabasca River region:

> I heard them talk about the land changing, the water changing, the animals changing I heard them talk like that but that is not right, not good because everything has changed, the change happened and delta is changed and the changes they can't come back so the land is not changing, it is changed and I don't think it can be fixed but they don't understand that so they don't see a big problem so they don't think they have to fix it now (Community Participant 22)

Referring to the waterscape as changing rather than changed suggested to Community Participants that the GoA perceived declines in ecosystem health as minor or acceptable, and that time was available to stop or reverse these declines if they continue. Consequently, to Community Participants, the GoA decided that the imposition of the AXF as a water withdrawal cut-off threshold unnecessary and that changing river navigability could be monitored and addressed if it became a problem.

2. Cause versus problem oriented water management: To Community Participants, the GoA's freshwater management approach was cause oriented rather than problem oriented, which constrained the types of policy solutions the GoA would consider. Community Participants 3, 17, 22, and 23 described cause-oriented freshwater management as an approach that set out to apportion blame to the potential causes of declining river flows and then regulate human uses of freshwater according to how much they are to blame for the decline. Community Participants contended that under the cause-oriented freshwater management approach, the GoA felt justified in rejecting industry-wide water withdrawal cut-off thresholds such as that proposed within ANF because the GoA perceived oil sands mining as being only a small contributor to the decline in river flows:

> this year they're saying we acknowledge that there's a serious navigational problem for the First Nation, but it's not our fault. It's not the oil sands' fault, so it's just a funny way of saying they know there's a problem, but they were really only considering it through the lens of not slowing down oil sands…so they don't have to restrict withdrawals from the river very much (Community Participant 3)

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Community Participants argued that cause-oriented freshwater management should be replaced by a more communal freshwater management approach that required all regional players reduce their freshwater use to address declining flows regardless of who or what is to blame:

> everyone tries to break it into, it's not the Bennett Dam's fault, isn't it climate change's fault, I'm saying you can't pull them apart. I mean, if there's a problem, there's a problem and if you're taking more water from the problem, you're exacerbating the problem, it doesn't matter who started it, you're all involved in the process. Maybe your role is smaller than the other people's, but it doesn't matter - the people can't navigate and you're taking water, you're exacerbating the problem, you're not helping it (Community Participant 22)

In short, the different framings for freshwater management created different perspectives about what constitutes appropriate or necessary water withdrawal rules. The imposition of water withdrawal cut-off thresholds such as ANF was considered inappropriate under the GoA's cause-oriented freshwater management approach but appropriate under MCFN's and ACFN's communal freshwater management approach.

3. Narrowed geographic scope of policy-making: Some Community Participants explained that the geographic scope of the instream flow needs work changed over time, creating uncertainty in whether river navigability in the Athabasca River delta would be protected. Community Participants 2, 14, 17, 22, and 24 explained that, to them, the geographic scope of policy-making should have encompassed the Lower Athabasca River and Peace River watersheds for two reasons. First, the two rivers are hydraulically connected within the Peace-Athabasca Delta: "the two rivers work together, pushing the water to flow in both directions in Quatre Fourche" (Community Participant 22). Second, MCFN's and ACFN's traditional territories overlap both watersheds, which Community Participants 14, 15, 17, 22, 24, and 29 explained by pointing out their territories on a map. However, the GoA "doesn't like to hear about the Peace because the dam is in B[ritish] C[olumbia]…they want to talk about the Athabasca" (Community Participant 22). Over time, the delta reaches of the Lower Athabasca River were excluded from the geographic scope due to the eco-hydrological complexity of the Athabasca River delta, which Community Participants 3 and 21 agreed with because additional time was needed for MCFN and ACFN to complete studies on the navigability of the Athabasca River delta so that the ANF could be refined. Some Community Participants, while acknowledging that additional studies were needed, were concerned that the GoA would not revise the SWQMFLAR once it was

released even if they were given new information by MCFN and ACFN: "once those numbers get locked in there, [GoA] won't want to change them" (Community Participant 17). If the SWQMFLAR was not revised, "the delta may never be protected from oil sands pumping water out of the river" (Community Participant 18). In short, Community Participants explained that excluding the delta from the geographic scope from the SWQMFLAR created an opportunity to refine ANF through additional studies, but that the opportunity to introduce refined ANF could be lost once the SWQMFLAR was finalized by the GoA.

6.1.7.3 *Legitimacy*

Legitimacy refers to the status of an organization, and innovations that are perceived as reducing an organization's legitimacy are less likely to be adopted (Steelman, 2010). Community Participants described how, to them, the demography and geography of Fort Chipewyan and MCFN's and ACFN's reliance on Traditional Knowledge likely delegitimized ANF to the GoA. Community Participants 4, 14, 15, 17, 18, 22, and 23 explained that because Fort Chipewyan is a small community of about 1000 people, it is politically inconsequential: "easy for the people from down south to forget about us" (Community Participant 17). Further, Community Participants contended that since most GoA representatives live upstream from the oil sands, changes in river flows do not acutely affect them, making it easier for them to dismiss MCFN's and ACFN's concerns: "easy for the people from down south…to be ignorant of the problems we see. What would happen if the river flowed south instead of north? Things would be different then" (Community Participant 17). The delegitimizing effects of demography and geography, contended Community Participants, were exacerbated by what they perceived as GoA's undervaluation of the contributions that Traditional Knowledge can make to understanding and managing the Lower Athabasca River:

> The government never listens to us...we talk about where we'll have the Traditional Knowledge and all that stuff, but they don't take it seriously and they don't use it anyway. They'd rather use scientific knowledge more so than traditional….I always ask [why they don't listen] more than once and I've never ever had a straight answer. You know, it seems like the scientists are their gods (Community Participant 22)

While come Community Participants indicated that they "hope it's not true that they [GoA representatives] see them as nothing", they maintained that because of Fort Chipewyan's

location, small population, and the GoA's (perceived) mistrust in Traditional Knowledge, the GoA placed little priority on meeting MCFN's and ACFN's needs: "they don't need to worry about it [river navigability] because it won't get them elected" (Community Participant 17).

6.2   Influences on ANF Adoption from the Government Participants' Perspectives

Section 6.2 presents the Government Participants' perspectives on the drivers and barriers to the GoA's adoption of ANF in two formats. The Government Participants' perspectives are first presented in summary tables to help orient the reader within this terminology heavy chapter. Table 6.4 summarizes the drivers and Table 6.5 summarizes the barriers to ANF adoption from the Government Participants' perspectives. Next, the Government Participants' perspectives are presented using the IIF format to explain in detail how IIF factors were (not) accounted for in ANF adoption. The detailed descriptions for each factor provide quotes and participant attributions to ground the findings in the data.

Table 6.4: Government Participants' perspectives on the drivers of the GoA's adoption of ANF

For brevity, attributions to Government Participants and quotes have been removed from the synthesis provided in the table, but all information in Table 6.4 constitutes Government Participant perspectives.

Individual Level	Structural Level	Cultural Level
Motivation Government Participants explained that the GoA's and DFO's shared concerns about the health of the aquatic ecosystem in the face of expanding oil sands developments brought these two agencies together to initiate a planning process to proactively achieve long term economic and ecological regional goals. The two government agencies also shared a desire for information that could inform regional freshwater policy-making, and this desire motivated the two governments to involve Indigenous peoples so that Traditional Knowledge could inform the planning process. **Norms & Harmony** Government Participants explained that, to help preserve ongoing government-community cooperation and uphold the GoA's commitments to water policy-making, existing GoA staff worked to prevent incoming staff from starting policy-making anew by educating them about the history and context of the policy development process leading to the SWQMFLAR. **Congruence** Intra-constellational congruence: Government Participants explained that, early in Phase 1, they collectively embraced objectives that address social and economic interests and policy-making as including subjective choices, making them more receptive to ANF and undertaking the work	**Rules** 1. Government Participants explained that the provisions related to water conservation objectives in Alberta`s *Water Act* provided the legislative support for the introduction of base flows into CEMA`s work. 2. Government Participants explained that navigation is typically considered a federal responsibility, but the GoA used its authorities related to recreation and transportation to address ANF. For example, water conservation objectives under Alberta's *Water Act* allows recreation and transportation objectives to inform water policy-making and the definition of instream flow needs in the 2003 Water for Life Strategy specifically references navigation. **Communications** To Government Participants, strong inter-organizational communication channels between the GoA and the First Nations fostered deeper mutual understandings of their respective needs and facilitated the GoA's reconsideration of the use of the ANF in policy-making. Especially critical to strengthening the inter-organizational communication channels were the joint, persistent, and clear messaging from MCFN and ACFN and their use of western scientists to improve the commensurability of the ANF with the statistical modelling approach underpinning the SWQMFLAR. The GoA in turn engaged with the	**Shocks** No single event catalyzed surface water quantity policy-making. Rather, three intersecting circumstances, including public pressure in response to water shortages in other watersheds such as the Bow River, forecasted rapid oil sands growth, and record low river flows in the Lower Athabasca River, converged in the late 1990s, catalyzing surface water quantity policy-making. **Framing** Government Participants described how over time the relationship between social, economic, and environmental objectives of the instream flow needs work was reframed, making them more receptive to including river navigability in SWQMFLAR development. The GoA initially perceived the achievement of social objectives as dependent on sustaining ecosystem function, but the GoA learned that social objectives needed to be understood as related to but separate from environmental objectives. **Legitimacy** Government Participants explained that using Traditional Knowledge to develop the environmental protections in the SWQMFLAR was perceived by the GoA as a way to legitimize its regulation of the oil sands industry, bolstering the marketability of oil sands products.

Individual Level	Structural Level	Cultural Level
necessary to incorporate ANF into the SWQMFLAR. Inter-constellational congruence: Government Participants described how MCFN and ACFN and GoA shared similar desires for people living in the Lower Athabasca River region to have a "high quality of life". To Government Participants, this congruency in social values supported the use of ANF as the ANF was perceived as helping "the people in Fort Chipewyan live healthy lives".	First Nations bilaterally and iteratively, "on location" in the community with senior government representatives, and with the support of their own western scientists to further build a more comfortable and informed engagement space. **Incentives** 1. Government Participants explained that funding and data sharing incentivized ongoing participation by MCFN and ACFN in policy development but was not the most critical factor. 2. Government Participants explained that the sense of satisfaction and accomplishment that federal and provincial government representatives received individually and organizationally by leveraging their own creativity, expertise, open-mindedness, and relationships with MCFN and ACFN generated the momentum needed to persevere in finding ways to use the ANF in the SWQMFLAR. **Opening** Government Participants explained that the GoA's shared stewardship model for freshwater resources management opened the policy-making structure to Indigenous perspectives, and when MCFN and ACFN withdrew their membership from CEMA, government staff continued to share information in a parallel bilateral process with the First Nations. This information sharing contributed to the development of the ANF, which was submitted outside of the P2FC collaborative. Initially, due to the timing of its submission, the GoA was	

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Individual Level	Structural Level	Cultural Level
	reluctant to consider the ANF, but the decision to include the SWQMFLAR under the Lower Athabasca Regional Plan created time and space for river navigability monitoring provisions to be developed. **Resistance** Government Participants explained that the GoA began to overcome internal resistance to the use of Traditional Knowledge in freshwater policy-making as the policy process progressed, which in turn supported the use of ANF in SWQMFLAR development.	

Table 6.5: Government Participants' perspectives on the barriers to the GoA's adoption of ANF

For brevity, attributions to Government Participants and quotes have been removed from the synthesis provided in the table, but all information in Table 6.5 constitutes Government Participant perspectives.

Individual Level	Structural Level	Cultural Level
Motivation Not applicable. **Norms & Harmony** Not applicable. **Congruence** Intra-constellational congruence: To Government Participants, achieving collective wellness underpinned the ANF, directly connecting surface water quantity management, river navigability, and wellness, but Government Participants expressed varied perspectives on that tripartite relationship. On the relationship between river navigability and wellness, Government Participants' perspectives ranged from no relationship between them to linking Indigenous peoples' wellness to river navigability. Government Participants' perspectives on the relationship between surface water quantity management and wellness ranged from no relationship between them to linking Indigenous and non-Indigenous peoples' wellness to surface water quantity management. In cases where Government Participants linked wellness to river navigability and surface water quantity management, the premise was that surface water quantity had to be managed to support outdoor recreational opportunities such as boating because outdoor recreation contributes to "healthy lifestyles". The lack of a collective understanding of the relationship between wellness, river	**Rules** Government Participants explained under the *Water Act*, water allocations could not be reduced unless the senior licenses were shown to be causing harm. Since the oil sands industry was negligibly impacting river flows, the SWQMFLAR did not address emergency water management, and paying compensation to senior water license holders was not feasible, industry-wide water withdrawal cut-off thresholds such as the AXF could not be imposed. **Communications** According to Government Participants, differing levels of specialist scientific training constrained information sharing, causing the First Nations to hold misperceptions about how the ANF were used and their collective ability to find mutually acceptable solutions. **Incentives** Not applicable. **Opening** To Government Participants, the GoA recognized that the ANF were grounded in Aboriginal and treaty rights but refused to discuss rights-related questions during informal discussions. Rather, they preferred court settlement of rights assertions and questions to prevent overburdening and stalling of policy-making. MCFN and ACFN were perceived as being dissatisfied by the GoA's	**Shocks** Not applicable. **Framing** Government Participants described two barriers associated with framing: 1. GoA's redefinition of the geographic scope of policy-making to address the technical complexity of determining instream flow needs prevented river navigability from being protected in ways meaningful to MCFN and ACFN. 2. The GoA framed the impacts of water withdrawals on river navigability for Indigenous uses as a non-urgent issue, resulting in river navigability being monitored rather than used as a criterion for establishing water withdrawal rules in the SWQMFLAR. **Legitimacy** According to Government Participants, the care with which the First Nations developed the ANF was recognized and appreciated by GoA, but MCFN and ACFN delegitimized their position when they withdrew from CEMA and submitted the *As Long as the Rivers Flow Report* outside of the collaborative. The submission of the report for unilateral consideration by the GoA was considered unfair to P2FC members for two reasons. First, there were no opportunities for

Individual Level	Structural Level	Cultural Level
navigability, and surface water quantity management made it difficult for Government Participants to regard ANF with the same sense of urgency that MCFN and ACFN did, resulting in river navigability being monitored through the SWQMFLAR. Inter-constellational congruence: Government Participants expressed concern about the commensurability of ANF with the modelling approach used to develop the SWQMFLAR, demonstrating inter-constellational incongruence. Government Participants found that the Traditional Knowledge within the *As Long as the Rivers Flow Report* "in the form of numbers" was "extremely valuable" (Government Participant 6), but Government Participants were unclear on how to quantitatively measure the incremental impacts of water withdrawals on river navigability using the ABF and AXF because of the lack of a zero point. The GoA also had concerns that the AXF did not fit with the empirical data on natural spring and fall flows. To improve the commensurability of ANF with the SWQMFLAR modelling approach, ANF were modified.	refusal to discuss rights, weakening their cooperation as it continued throughout SWQMFLAR development. **Resistance** The GoA resisted imposing water withdrawal limits on existing licensees to prevent (potential) unnecessary disruption of oil sands production and the wealth generated by that industry. Justifications for this decision included (i) the existing licensees' voluntary reductions in their licensed peak instantaneous rates by 50%; (ii) new mines ceasing water withdrawals at the prescribed low flows; and (iii) contentions that river flows were not severely impacted by oil sands water withdrawals. The GoA felt that a reasonable compromise had been reached such that freshwater policy supported economic development within acceptable levels of risk to the river flows.	collaborative scrutiny of the potential impacts of the ANF to other regional interests or collaborative investigation to reduce uncertainty in the ANF calculations. Second, the GoA wanted to respect the efforts made by Indigenous P2FC members who were more acutely impacted by oil sands development. These fairness problems caused by MCFN's and ACFN's self-marginalization could have been at least partially overcome if the *As Long as a Rivers Flow Report* represented the needs of many downstream Indigenous peoples.

6.2.1 Keystone Factors – Framing at the Cultural Level of the Implementing Innovation Framework

Government Participants identified framing, which is how situations or problems are defined to incite action, as the keystone factor influencing ANF adoption (Steelman, 2010). Specifically, to Government Participants, the GoA framed policy-making leading to the SWQMFLAR as the need to reasonably integrate diverse interests without losing sight of the GoA's desired outcomes for the oil sands industry. The RSDS committed to a shared-stewardship model through which individuals and organizations could become involved in policy-making, but to some Government Participants, the key interests needing integration were those of the surface mineable oil sands operators and the downstream Indigenous peoples immediately affected by the SWQMFLAR (Government Participants 5 and 6). Although their intent was to integrate different interests, the GoA's economic interests in the oil sands industry were paramount which prevented the GoA from supporting proposed water withdrawal rules that interfered with those economic interests: "[ANF] didn't fit with the Athabasca River flow regime and our ability to effectively manage oil sands water withdrawals without significantly, negatively impacting the functionality of the industry" (Government Participant 6). In short, Government Participants perceived policy-making as a values-based endeavor through which provincial economic interests were prioritized, constraining the policy prescriptions that could be applied to meet diverse interests.

6.2.2 Individual Level Drivers

6.2.2.1 Motivation

Motivation is "the stimulus that drives individuals to alter the status quo situation" (Steelman, 2010, p. 16). In this case, in the early 1990s, aquatic scientists from GoA and DFO were motivated to initiate water policy-making using diverse information sources for the Lower Athabasca River region. Sharing similar concerns about the potential impacts of rapid expansion of oil sands mining on the health of the aquatic ecosystem (Government Participant 7; Alberta Environment, 1999), GoA and DFO aquatic scientists combined their expertise and resources to proactively achieve ecological and economic regional goals acceptable to both levels of

government (Government Participants 7 and 15). The intergovernmental collaboration was expanded to include Indigenous peoples because "[they] were scientists trying to get as much information as [they] could and so [they] included Elders" (Government Participant 7). Traditional Knowledge held by Elders was perceived as a helpful source of high-level commentary on the state of the local environment:

> the first place to start when you're wanting to understand an ecosystem is ask people, Aboriginal or otherwise, you know, uh, ranchers, farmers, whatever, you know, what the land and what they've – what are the general, what are the general observations that you could maybe deduce something from, uh, that are occurring in the system. So call it TEK, call it, you know, anecdotal, call it whatever, there's a knowledge base there that can be tapped into. (Government Participant 7)

The desire held by GoA and DFO aquatic scientists for diverse information about the aquatic ecosystem of the Lower Athabasca River region created an opportunity to effect proactive change in how freshwater resources were managed using, in part, Traditional Knowledge.

6.2.2.2 Norms and Harmony

Norms and harmony refer to the social norms and desire to preserve harmony that characterize workplaces (Steelman, 2010). Innovations that maintain social norms and harmony are likelier to be adopted (Steelman, 2010). Freshwater policy-making for the Lower Athabasca River took about 15 years to complete, and during that time, according to Government Participants, CEMA members developed expectations about their ongoing involvement in the policy process, process timeliness, and water management approaches. When new GoA representatives entered the planning process due to organizational restructuring or staff turnover "there was almost a desire then to start again from scratch rather than using the material that was previously worked" (Government Participant 3). To Government Participants, starting freshwater policy-making over again would have undermined the collaborative work already completed; may have damaged relationships built over the years between governments, communities, and industry; and would have wasted the resources invested over that period. To help preserve ongoing cooperation amongst CEMA members and uphold the GoA's commitments to freshwater policy-making, existing federal and state government representatives took the time necessary to inform new government representatives of the history of and background on Lower Athabasca River freshwater policy-making:

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[staff turnover] then [led] to a renewed need to re-explain to new managers so they underst[ood] the issues and where it came from [because] all that history…is long and it's important in terms of where the file came from and where it's going and why it's needed (Government Participant 3).

Stated differently, existing government representatives were able to preserve harmony amongst CEMA members by convincing new GoA representatives to maintain the norms and expectations that had built up over the 15-year policy-making process within CEMA.

6.2.2.3 *Intra-constellational Congruence*

Intra-constellational congruence refers to the degree of alignment of values and perspectives amongst individuals working within an organization considering innovation adoption. The greater the intra-constellational congruence in values and perspectives within an organization, the likelier that an innovation will be adopted. Although the instream flow needs work initially focused on fisheries protections,[52] Government Participants consistently described embracing the need to address diverse social, economic, and ecological objectives early in the policy-making process as CEMA members shared their diverse perspectives. For example, Government Participant 2 explained that "it became quickly apparent that we needed to broaden that process, our thinking around goals because the people at the table, First Nations and industry, were raising good points". Additionally, through the P2FC process, Government Participants described becoming more comfortable with "working with values and science"

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[52] Government Participants explained that, in their opinion, ANF were developed in response to the initial narrow focus on fisheries in the instream flow needs work because MCFN and ACFN wanted their river uses protected in surface water quantity management policy:

> [ANF were] introduced as a complement to the ecological instream flow needs…which was primarily focused on the fish habitat needs and other environmental factors for the downstream (Government Participant 3)

> the First Nations communities didn't feel that the Western Science-based numbers that were used to develop initial drafts of the surface quantity management framework sufficiently represented their interests on the Athabasca River specifically in terms of their ability to pursue traditional activities… There was a sense that those numbers didn't adequately - leave adequate volumes of water in the river for the - to enable the pursuit of traditional activities. So, the work of the First Nations communities largely Mikisew First Nation and the ACFN, the Athabasca Chipewyan First Nation was a means of trying to identify what volumes would be required in the river what flow of volumes to enable them to effectively pursue those activities that they normally would (Government Participant 6)

(Government Participant 2), signaling that policy-making was perceived as including subjective choices that factored in factual information (Government Participants 2, 6, and 15). Accepting policy-making as including subjective choices enabled Government Participants to "see there wasn't one true answer, we just needed to be able to defend our choices transparently" (Government Participant 2). As a result of their collective acceptance of objectives that address social and economic interests and policy-making as including subjective choices, Government Participants were more receptive to ANF and undertaking the work necessary to incorporate ANF into the SWQMFLAR.

6.2.2.4 Inter-constellational Congruence

Inter-constellational congruence refers to the degree of alignment of values represented by an innovation and the organization that is considering adoption of an innovation. The greater the congruence in the two sets of values, the more likely that an innovation will be adopted. Government Participants 3, 6, and 15 described how the First Nations and GoA shared similar desires for people living in the Lower Athabasca River region to have a "high quality of life". To Government Participants, this congruency in social values supported the use of ANF as the ANF perceived as helping "the people in Fort Chipewyan live healthy lives" (Government Participant 2).

6.2.3 Structural Level Drivers

6.2.3.1 Rules

Rules provide top-down support for innovation adoption (Steelman, 2010). In this case, rules (1) *supported initiation of the instream flow needs work* and (2) *inclusion of river navigability provisions in the SWQMFLAR*, which together enabled the GoA's use of ANF in SWQMFLAR development and are described below.

1. Rules supporting the instream flow needs work: The authority to determine the instream flow needs of the Lower Athabasca River was provided to by Alberta's *Water Act* to undertake water management planning and set water conservation objectives by Alberta's *Water Act* (see Hardy & Richards, 2005; Government Participant 2). Government Participants 3 and 6 explained that the instream flow work was initially scoped to determine the amount or quantity of freshwater

needed to protect the aquatic ecosystem so that a water conservation objective could be set for the Lower Athabasca River. According to Government Participant 6, in the end, the GoA chose not to establish formal water conservation objectives in the SWQMFLAR, instead using the ecologically important thresholds derived from the instream flow needs work to set water withdrawal rules in the SWQMFLAR.

2. Rules supporting the inclusion of river navigability provisions in the SWQMFLAR: Government Participants 6 and 15 described how the GoA used is authorities pertaining to recreation to address Indigenous river navigability because of the federal government's limited authority under the federal legislation titled, at that time, the *Navigation Protection Act.*[53] Authorities under the *Navigation Protection Act* in force in 2010 were understood by Government Participants to pertain only to the construction or placement of works and fill in navigable waters, but ANF were developed in response to concerns over the impacts of water withdrawals on river navigability. Consequently, the federal government did not participate in SWQMFLAR development. Despite the gap at the federal level, Government Participants 6 and 15 described how provincial legislation and policy supported the inclusion of river navigability monitoring provisions in the SWQMFLAR. A full examination of the intersection of freshwater management and river navigability at the provincial level is outside the scope of this thesis, but two examples of legal and policy supports for inclusion of river navigability provisions in provincial policy are provided below:

- Under section 1(hhh) of Alberta's *Water Act*, water conservation objectives may include amounts of water needed to protect recreation and transportation. In the *As Long as the Rivers Flow Report*, MCFN and ACFN identified transportation as one of the reasons why river navigability needed to be sustained.
- The 2003 *Water for Life Strategy* (GoA, 2003) defines instream needs as "the scientifically determined amount of water, flow rate or water level that is required in a river or other body of water to sustain a healthy aquatic environment or to meet human

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[53] Navigation is a federal responsibility under subsection 91(10) of the *Constitution Act, 1867*, The federal government declared the entire length of the Lower Athabasca River a navigable water under Schedule 2 of the then titled *Navigation Protection Act*, legislation that authorized and regulated interferences with the public right of navigation (La Forest, 1973).

needs such as recreation, **navigation**, waste assimilation, or aesthetics. An instream

need is not necessarily the same as the natural flow" (p. 29) (author's emphasis added).

Recognizing how central boating for recreation, transportation, and traditional uses was to

MCFN's and ACFN's way of life, "the GoA wanted to find a way to use the Aboriginal

[Navigation] Flows since the feds couldn't" to protect river navigability against impacts from oil

sands water withdrawals (Government Participant 2).

6.2.3.2 Communications

Communications refer to how people in engage with each other to develop a clear

understanding of an innovation (Steelman, 2010). Government Participants agreed that strong

interorganizational communication between MCFN, ACFN, and GoA staff were most critical to

the GoA's use of ANF in SWQMFLAR development. When ANF were first introduced in 2010,

the GoA was reluctant to use them because they did not align with the modelling approach used

to develop the water withdrawal rules (see section 6.2.5.4) and information on the effects of oil

sands water withdrawals on river navigability was incomplete (see section 6.2.7.2): "the initial

response was to, was to maintain or retain that information [ANF] for future consideration within

revisions of the framework" (Government Participant 6). According to Government Participants,

MCFN and ACFN mobilized the GoA to advance ANF in the policy-making process despite

their initial reluctance because of MCFN's and ACFN's powerful communications efforts:

> the level of effort and time that went into development of the document was a strong
> motivating factor…[MCFN and ACFN] remained quite determined to have that
> information captured within the framework and they were very successful at that and it was
> very useful to us in terms of actually driving us that extra step towards finding a way of
> making those two numbers a meaningful contribution to the framework. (Government
> Participant 6)

Certain aspects of the First Nations' communications particularly captured and held the attention

of the GoA during Phase 3 of policy-making. MCFN and ACFN:

- strengthened their voices by jointly developing and communicating about ANF so that

  the set of concepts represented multiple rather than a single interest (Government

  Participants 6 and 15).

- shared their key messages clearly, consistently, and persistently (Government

  Participants 3 and 6).

- used western scientists to improve the commensurability of ANF with the statistical modelling-based approach for establishing water withdrawal rules initiated by the P2FC (see section 4.2.5.2) (Government Participants 3, 6, and 15).

The GoA spoke about the broader impact of MCFN's and ACFN's powerful communications: "ACFN, MCFN have done yeoman's work in terms of moving the conversation forward and…benefiting their peers within the other First Nations in the basin". MCFN and ACFN, by clearly and persistently promoting ANF, were able to elevate the priority placed on river navigability for the benefit of all downstream Indigenous peoples during SWQMFLAR development.

Government Participants also explained how they engaged thoughtfully with MCFN and ACFN through "several rounds of engagement…and one-on-one discussions" (Government Participant 3) during Phase 3 of policy-making. Although the P2FC's recommendations were heavily weighted during SWQMFLAR development because they were developed through a neutrally facilitated, collaborative process that intensely evaluated the potential consequences of a range of water withdrawal rules (see section 4.2.4) (Government Participants 3, 6, and 15), the GoA also sought out feedback on draft policy documents. To facilitate the gathering of feedback, Government Participants described how the GoA built rapport with regional stakeholders, including MCFN and ACFN, using the following communications practices:

- Bilateral and iterative discussions with Indigenous peoples and their leaders (Government Participants 3 and 6).
- Direct interactions between senior government managers and MCFN and ACFN (Government Participant 6).
- "On location" engagement with MCFN and ACFN in Fort McMurray rather than solely in Edmonton (Government Participants 3 and 6).
- Collaborative and bilateral discussions between western scientists assisting the First Nations and GoA representatives (Government Participants 3, 6, and 15).

Collectively, these thoughtful communications practices, along with longer-term staff, created a "more comfortable environment" that "enabled a more intimate conversation, a more intimate understanding of where the various sectors [including MCFN and ACFN] were coming from" (Government Participant 6). In short, as the GoA began to more deeply understood the ANF, the GoA became more willing to expend the effort to use ANF despite uncertainty about the impacts

of water withdrawals on river navigability, creating the means for "future success" in the continued incorporation of Traditional Knowledge into Lower Athabasca River surface water quantity policy (Government Participant 3 and 6).

6.2.3.3   Incentives

Incentives refer to the benefits or resources that encourage behavioral change towards an innovation (Steelman, 2010). In this case, incentives facilitated MCFN's and ACFN's introduction of ANF and the GoA's inclusion of river navigability protections in the SWQMFLAR. To Government Participants 3 and 15, the GoA's sharing of resources, including funding and information, with MCFN and ACFN incentivized ANF development. Information sharing kept MCFN and ACFN abreast of the P2FC's work so that they could proactively respond to P2FC recommendations, while funding enabled MCFN and ACFN to contract assistance to help with the preparation and promotion of their submissions (Government Participants 3 and 15). However, funding was not considered a critical incentive to ANF development (Government Participants 3 and 15).

Following the introduction of ANF to federal and provincial governments, Government Participants 3 and 6 described how provincial government representatives gained personal satisfaction as they leveraged their own creativity, expertise, open-mindedness, and relationships with MCFN and ACFN to develop workable river navigability protections. As explained by Government Participants, as more provincial government representatives grew proud of how Traditional Knowledge was being used to develop the SWQMFLAR, organizational level satisfaction grew: "I think we, as an organization, and as individuals working for government, we did garner a lot of value from that process" (Government Participant 6). Individual and organizational level satisfaction made the GoA excited about future opportunities for collaboration: "it is simply an index [Aboriginal Navigation Index] but it's already opened up the door to additional communication, to additional collaboration and to cross pollination" (Government Participant 6). Together, incentives that enabled the introduction of ANF by MCFN and ACFN and the GoA's use of ANF contributed to what Government Participant 6 described as progressive freshwater policy-making based partly on Traditional Knowledge and cooperation with MCFN and ACFN.

6.2.3.4 Opening

Opening refers to the ability of marginalized groups to foster change within an existing political structure (Steelman, 2010). The more open the political structure is, the likelier that change will be effected. In this case, the political structure throughout all three phases leading to the SWQMFLAR were open to MCFN and ACFN, although initially phase 3 was closed to ANF. The first policy-making phase was designed from the outset to be open to MCFN and ACFN, among other regional interest holders, because a regional participatory body (CEMA) had been convened to make recommendations to the GoA on the instream flow needs of the Lower Athabasca River (Government Participants 7 and 15). MCFN and ACFN, among other Indigenous CEMA members, advocated to have Indigenous river uses included as interests in the instream flows needs work to which CEMA agreed (Government Participants 7 and 15). Although MCFN and ACFN withdrew from CEMA near the end of Phase 1, the political structure of Phase 2 remained open to MCFN and ACFN because the GoA continued to keep the First Nations abreast of the P2FC's work during Phase 2: "best efforts were undertaken [by the GoA and DFO] with the best intentions to keep MCFN and ACFN in the loop after they left CEMA" (Government Participant 15). Phase three of policy-making was open to MCFN and ACFN because the GoA sought input directly from them on drafts of the SWQMFLAR which did not include river navigability provisions at first. When MCFN and ACFN introduced ANF as part of its submissions during SWQMFLAR preparation, the GoA was initially reluctant to use ANF:

> [S]ome independent work was done by ACFN and MCFN in terms of the Candler report but that came to government after the end of the P2FC process so then it was harder to incorporate that, that feedback, because of the timing of receiving it…it was difficult for people to know how… many more updates to make, how many more changes to make, or just focus on what had been worked on during the committee, the P2FC process, and include that (Government Participant 3)

The GoA's reluctance was in part out of concern that incorporating ANF into the SWQMFLAR would take time, preventing the GoA from meeting its commitment to implement the SWQMFLAR by January 2011 (Government Participant 3). However, the GoA's timeline was extended because it decided to incorporate the SWQMFLAR as a framework under the Lower Athabasca Regional Plan (Government Participant 4), creating an opening for ANF to be

considered by the GoA: "it took so long for us to get a framework out but then there was an opportunity for [ANF] to be considered and included" (Government Participant 3). The additional time reopened the political structure so that the GoA could work with MCFN and ACFN on how to include river navigability provisions in the SWQMFLAR. In short, the open political structure created an opportunity for MCFN and ACFN to explain their river uses to the GoA and persuade the GoA to address river navigability in the SWQMFLAR.

6.2.3.5   *Resistance*

Resistance refers to opposition to new practices, but when there is little resistance or that resistance can be overcome, an innovation is more likely to be adopted (Steelman, 2010). In this case, within the GoA there was initial resistance to the use of Traditional Knowledge in policy-making because GoA representatives were unsure how to use it, but the introduction of ANF challenged the GoA to overcome that resistance:

> everybody knew and has known for some time was necessary but nobody really knew how best to go about more broadly incorporating traditional knowledge, incorporating First Nations experience into modern policy development and modern management decision making. So, it was, like I said it was a significant departure from where we'd been operating in that place until that time I think and really challenged us to rethink how to go about how to incorporate that knowledge within our system or processes. (Government Participant 6)

As GoA representatives analyzed ANF and worked with MCFN and ACFN, they became increasingly comfortable working with Traditional Knowledge, perceiving it as a reliable source of information. For example, the river flow thresholds within the ANF were found to "correspond reasonably well with river bathymetry and hydraulic modelling studies carried out to support the P2FC recommendation process" (GoA, 2015, p. 38; also Government Participant 2). Decreasing resistance to the use of Traditional Knowledge over time supported the GoA's use of ANF to develop river navigability monitoring provisions in the SWQMFLAR.

6.2.4 Cultural Level Drivers

6.2.4.1 *Shocks*

Shocks are catalytic events that create opportunities for new practices to be adopted (Steelman, 2010). In this case, no single event catalyzed the GoA to initiate freshwater policy-making for the Lower Athabasca River for the first time. Rather, in the 1990s, the combination of growing public interest in freshwater protections across the province in response to overallocated freshwater resources in southern Alberta and forecasted rapid oil sands mining expansion catalyzed the GoA to start the instream flow needs work:

> Oil sands mining was expanding…people were asking questions well, how much water can you take from the Athabasca River? Is this gonna end up like the Bow [River]?... the instream flow needs became an issue and we jumped on it right away. We recognized it as a very valid and important question, what kind of withdrawals can be sustained from the Athabasca River, and we started looking into it. (Government Participant 7)

Further impetus for the instream flow needs work was provided by the record low Athabasca River flows in the early 2000s (Golder Associates, 2004; Government Participant 7). The GoA's initiation of the instream flow needs work for the Lower Athabasca River in turn created an opportunity for MCFN and ACFN, among other Indigenous peoples, to have their river uses accommodated in surface water quantity management planning. Hence, public pressure for freshwater protection, fast economic growth, and declining freshwater availability intersected to create the conditions that allowed river navigability to be included as a policy-making objective.

6.2.4.2 *Framing*

Framing refers to the ways in which problems or situations are explained, prompting action to be taken. In this case, Government Participants described how over time the relationship between social, economic, and environmental objectives of the instream flow needs work was reframed, making them more receptive to including river navigability in SWQMFLAR development. The GoA initially perceived the achievement of social objectives as dependent on sustaining ecosystem function, but the GoA learned that social objectives needed to be understood as related to but separate from environmental objectives:

People's quality of life depends on healthy ecosystems so we focused on environmental protections in CEMA… environmental considerations were already being discussed, but then navigation and some of the other social considerations were introduced by the people at the table, so the conversation grew from environmental factors to recognizing that many different factors had to be considered together for people to have quality of life. (Government Participant 2)

Shifting perceptions of social objectives contributed to the GoA's commitment during Phase 1 of policy-making to address river navigability in the instream flow needs work: "we realized how important it [river navigability] was to the Aboriginal communities and included it in policy with fisheries measures" (Government Participant 2).

6.2.4.3   *Legitimacy*

Legitimacy refers to the concern that organizations have about their status within the broader contexts within which they operate (Steelman, 2010). Innovations that enhance an organization's legitimacy are more likely to be adopted. Government Participants described how, in this case, the GoA's environmental regulation of the oil sands industry needed to be perceived as legitimate for the industry to "receive the social license" (Government Participant 6). Seeking a social license for, or in other words, public acceptance of the oil sands industry underpinned SWQMFLAR development because the GoA wanted to improve the marketability of oil sands products, as highlighted by the following quote from Kyle Fawcett, then Minister of Environment and Sustainable Resource Development speaking at the news conference for the release of the SWQMFLAR on March 13, 2015:

> Albertans have made it very clear that they want our energy and our natural resources developed in a responsible manner and we believe that [the release of the SWQMFLAR and Tailings Management Framework] pushes and raises the bar higher when it comes to environmental standards and we think that this will have a positive impact on the environment but it will also develop a better story for us to be able to market our products around the world as being developed responsibly (Fawcett, 2015, timestamp 17:17-17:46).

As demonstrated by the above quote, the GoA sought to increase public acceptance of oil sands mining by establishing environmental protections for the Lower Athabasca River region through the SWQMFLAR. Government Participants also explained that the SWQMFLAR was legitimized by using Traditional Knowledge, including ANF to develop its contents: "incorporating First Nation's knowledge within it enhance[d] the credibility of the framework

[SWQMFLAR] as a meaningful management tool for water withdrawals from the Athabasca River" (Government Participant 6). In short, the GoA's use of ANF was facilitated by the GoA's desire for legitimacy in how it regulated the oil sands industry through environmental protections derived in part using Traditional Knowledge.[54]

6.2.5 Individual Level Barriers

6.2.5.1 Motivation

Not applicable.

6.2.5.2 Norms and Harmony

Not applicable.

6.2.5.3 Intra-constellational Congruence

Intra-constellational congruence refers to the degree of alignment of values and perspectives amongst the individuals working within the organization considering the adoption of an innovation (Steelman, 2010). The greater the incongruence in values and perspectives within an organization, the less likely that an innovation will be adopted. In this case, achieving collective wellness underpinned the ANF, directly connecting surface water quantity management, river navigability, and wellness (see section 5.1), but Government Participants expressed varied perspectives on that tripartite relationship. Government Participants' perspectives on the relationship between surface water quantity management and wellness ranged from no relationship between them to linking Indigenous and non-Indigenous peoples' wellness to surface water quantity management. In cases where Government Participants linked wellness to river navigability and surface water quantity management, the premise was that surface water quantity had to be managed to support outdoor recreational opportunities such as boating because outdoor recreation contributes to "healthy lifestyles". The lack of a collective

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[54] The statements made about legitimacy should not be interpreted as commentary on the efficacy of the SWQMFLAR in protecting the aquatic ecosystem of the Lower Athabasca River or the appropriateness of how GoA used Traditional Knowledge in the development of the SWQMFLAR. The statements about legitimacy describe Government Participants' perspectives on how legitimacy shaped the GoA's actions with respect to ANF.

understanding of the relationship between wellness, river navigability, and surface water quantity management made it difficult for Government Participants to regard ANF with the same sense of urgency that MCFN and ACFN did, resulting in river navigability being monitored through the SWQMFLAR. Table 6.6 provides examples of quotes reflective of the range of perspectives heard from Government Participants on the relationships between wellness and river navigability and surface water quantity management.

Table 6.6: Quotes from Government Participants on the relationships between human wellness and river navigability and surface water quantity management

Relationship	Nature of the Relationship	Quote
Relationship between river navigability and human wellness	No relationship	I don't know of a direct connection to human health (Government Participant 4)
	Indigenous peoples' wellness is connected to river navigability	[navigation is] linked to the impact on people's health of not being able to access areas where they can go to collect berries, or fish, or hunt, or be out on the land where they used to be, the connection to their traditional way of life. That can impact people's health too, right (Government Participant 19)
	Recreational opportunities contribute to human health	go further to ensure the quality of life in the region meets the expectations of its residents (Lower Athabasca Regional Plan; GoA, 2012, p. 23)

enjoyable outdoor recreation opportunities…contribute to healthy lifestyles (Lower Athabasca Regional Plan; GoA, 2012, p. 23) |
Relationship between surface water quantity management and human wellness	No relationship	Government Participant 17 said that surface water quantity management and wellness were "probably not related",
	Human wellness linked to water contamination but not water quantity	deposition of contaminants from all the stacks…into the landscape where it accumulates in plants…lower animals in the food chain and then of course those up through the food chain…those were seen more as the real issues from the human health perspective for the instream flow needs (Government Participant 7)
	Indigenous peoples' and non-Indigenous peoples' wellness are connected to surface water quantity management through recreational opportunities	many department representatives for multiple agencies recognize the connection between social health and individual well-being to outdoor activities including the traditional activities of Indigenous people (Government Participant 15)

6.2.5.4 Inter-constellational congruence

Inter-constellational congruence refers to the degree of alignment of values represented by an innovation and the organization that is considering adoption of an innovation. The greater the

incongruence in the two sets of values, the more likely that an innovation will be adopted. In this case, Government Participants expressed concern about the commensurability of ANF with the modelling approach used to develop the SWQMFLAR, demonstrating inter-constellational incongruence. The set of water withdrawal rules in the SWQMFLAR were derived primarily from the P2FC recommendations made after the evaluation of modelled consequences of different water withdrawals on environmental, social, and economic indicators:

> I'm not sure if it is precedent in terms of, um, that level of modeling exercise, which is essentially what the framework, that particular framework is about. Like I said it's about climate change, models, it's about flow or hydrologic models for the Athabasca River. It's all based on very hard, uh, information. It's based on upstream water withdrawals, it's based on known expansions over time, predicted increases in water withdrawals, all these very, um, um, either science based information or information based on regulatory data. (Government Participant 6)

Government Participants valued the P2FC's systematic evaluations of different rule sets because water withdrawal consequences were quantified using scientific information and they perceived the discussions held by the P2FC as collaborative and transparent. Government Participants also found that the Traditional Knowledge within the *As Long as the Rivers Flow Report* "in the form of numbers" was "extremely valuable" (Government Participant 6), but Government Participants were unclear on how to quantitatively measure the incremental impacts of water withdrawals on river navigability using the ABF and AXF:

> numbers are based on Traditional Knowledge, on the ground experience. It's difficult to incorporate them into a framework that's based largely on statistical evaluations, on modeling exercises. We had considerable difficulty translating that into something that would effectively align with the other information, again the Western Science based information that was already developed through the CEMA process and through the initial development stages of the framework. So, we again we took a long hard look at the report, we acknowledged the two numbers that refer to the ABF and the AXF, and we looked at ways of, of translating that into something that could effectively be applied within the framework (Government Participant 3).

The most challenging aspect of trying to use ANF to measure the impacts of water withdrawals on river navigability was the lack of a zero point corresponding to when river navigability was impossible, but there were also some concerns that the ABF and AXF did not fit with the empirical data on natural spring and fall flows:

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the issue in large part was that the base flow itself is actually higher than some of the natural low flows in the river. And conversely the extreme flow is actually considerably higher than the maximum flows that generally tend to be in the Athabasca River. So, there's a discrepancy there in terms of what naturally occurs in the river and the expectations of the First Nations in terms of what they would like to see or the flows that would best enable them to pursue their traditional activities (Government Participant 6)

To improve the commensurability of ANF with the SWQMFLAR modelling approach, ANF were modified, leaving the GoA "in a more solid position in terms of both [SWQMFLAR] revisions and…[their] ability to effectively evaluate the influence of both climate change and anthropogenic activity on water levels and…traditional activities" (Government Participant 6). Analyzing ANF concepts to confirm whether they empirically fit with hydrometric data is outside the scope of this thesis, but perceptions that the experiential based data were unreliable and that defensible decision making requires hard, quantitative data constrained the use of ANF in the SWQMFLAR.

6.2.6 Structural Level Barriers

6.2.6.1 Rules

Rules provide top-down support for and expectations around innovations (Steelman, 2010). Unclear or differently interpreted rules can impede the adoption of innovations (Steelman, 2010). In this case, to Government Participants, under Alberta's *Water Act*, they needed to show that an emergency was being experienced in order to impose water withdrawal cut off thresholds on senior oil sands licensees: "it's just much more difficult with those grandfathered [senior] licenses…the director has to show harm before he can take the water or to pay, provide compensation for the taking of that water, for the reneging on the license if you will" (Government Participant 7). Since "paying compensation is difficult" (Government Participant 2), the SWQMFLAR does not address emergency water management, and Government Participants asserted that surface mineable oil water withdrawals negligibly impact river flows, the GoA decided against imposing water withdrawal limits on senior and existing licenses that were lower than the reduced limits that the licensees agreed to during Phase 2 (see section 4.2.4). Instead, the GoA, decided to address the uncertainty around the impacts of water withdrawals on river navigability by committing to a monitoring program and revising the SWQMFLAR as necessary.

6.2.6.2 Communications

Communications refer to information exchange, interactions, and relationship building between people to enable a clear understanding of the nature and operationalization of an innovation (Steelman, 2010). When communications are unclear or interactions are difficult, innovations are less likely to be adopted (Steelman, 2010). In this case, Government Participants contended that the lack of technical training amongst representatives for MCFN and ACFN hindered their bilateral information exchange, although, as Government Participant 19 observed, this challenge was not limited to Traditional Knowledge holders, as both he and other non-Indigenous P2FC members "had trouble following the discussions sometimes". Specifically, some Government Participants described how it was difficult to explain the technical conversations that the P2FC engaged in, pointing out that "MCFN and ACFN would have been better off participating in the group" (Government Participant 2). After ANF were introduced, Government Participants described how it was challenging from their perspective to explain the rationale for and calculations used to derive the Aboriginal Navigation Index to MCFN and ACFN representatives who lacked training in hydrology. To Government Participants, different specialist backgrounds (scientific versus land-based) constrained the ability to find mutually acceptable solutions that were well understood broadly amongst the First Nations and federal and provincial government representatives.

6.2.6.3 Incentives

Not applicable.

6.2.6.4 Opening

Opening refers to the ability of marginalized groups to foster change within the existing political structure (Steelman, 2010). When political structures are closed, change is less likely (Steelman, 2010). Government Participants recognized that ANF were grounded in Aboriginal and treaty rights, but they blocked attempts made by MCFN and ACFN to discuss the nature and extent of and potential impacts on rights because they felt that freshwater policy-making was an inappropriate vehicle for rights-based debates:

the department position was we could either continue to collaborate on the issue, or if there was a concern that the communities felt was not addressed then we would stop the conversation, and they could make a constitutional challenge (Government Participant 3)

To Government Participants, resolving long-standing rights-related questions would overburden freshwater policy-making and stall implementation of freshwater protections for the Lower Athabasca River. Government Participants preferred court settlement of rights-related questions and wanted to instead focus on understanding Indigenous river navigability needs to inform freshwater policy-making because, to Government Participants, "the process would not alter existing legal and constitutional rights and responsibilities" (GoA, 2012, p. 2). Government Participants 3 and 15 perceived that MCFN and ACFN were dissatisfied by the GoA's refusal to discuss rights, weakening their cooperation as it continued throughout SWQMFLAR development.

6.2.6.5   Resistance

Resistance refers to inertia created by vested interests that seeks to preserve the status quo (Steelman, 2010). Greater the resistance, the less likely an innovation will be adopted (Steelman, 2010). Government Participants described how a "reasonable" compromise had to be reached within the SWQMFLAR to "support economic growth within acceptable levels of risk to river flows" (Government Participant 6). To Government Participants, growth of oil sands development needed to be supported because of the wealth that it generated for Alberta, and that support in part came from providing certainty in freshwater access to existing oil sands companies that held senior licenses. In the SWQMFLAR, the GoA established water withdrawal limits that allowed only the existing licensees to continue withdrawing freshwater regardless of river flows at any point in time (GoA, 2015). According to Government Participants, there were three justifications for the lack of an industry-wide water withdrawal cut-off threshold in the SWQMFLAR: (1) Suncor and Syncrude, the senior licensees, voluntarily reduced their licensed peak instantaneous rates by 50%, and these reduced rates were incorporated into the SWQMFLAR as mandatory limits (Government Participant 3); (2) all new oil sands developments must cease water withdrawals at the prescribed low flows (Government Participant 6); and (3) river flows were not severely impacted by oil sand water withdrawals: "the actual influence of the water withdrawals on the Athabasca River is relatively limited"

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because "the cumulative withdrawals of the…mineable oil sands sector is less than 1% [of] the flow" (Government Participant 6). Based on these three preceding justifications, some Government Participants perceived the GoA's decision to not include the AXF as an industry-wide water withdrawal cut-off threshold as part of the reasonable compromise it was seeking in the SWQMFLAR in terms of maintaining the region's status quo economic growth while protecting non-economic interests.

6.2.7 Cultural Level Barriers

6.2.7.1 *Shocks*

Not applicable.

6.2.7.2 *Framing*

Framing refers to the ways in which problems are explained, prompting action to be taken (Steelman, 2010). Government Participants described two barriers associated with framing that are presented in more detail below under the headings of (1) *redefining the problem to address complexity* and (2) *uncertain impacts of oil sands water withdrawals on river navigability.*

1. Redefining the geographic scope of policy-making to address complexity: Government Participants' redefinition of the geographic scope of policy-making to address the technical complexity of determining instream flow needs prevented river navigability from being protected in ways meaningful to MCFN and ACFN. Government Participants described how over time they grew increasingly aware of the technical complexity of determining the instream flow needs of the Lower Athabasca River.[55] To deal with the complexity, the geographic scope of the work

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[55] Determining an instream flow needs proved to be more technically difficult than envisioned in the early years of CEMA because (i) similar instream flow needs work on large cold region rivers had not been completed at that time (Government Participants 4, 7, and 15); (ii) little hydrological, biological, and water usage data available were available for the Lower Athabasca River in the early 2000s and several years would be required to collect it (Golder Associates, 2004); and specific to river navigability, (iii) the Phase 2 studies on impacts of water withdrawals on Indigenous river navigability were flawed (Government Participant 3; Ohlson et al., 2010). These three technical challenges were compounded by the uncertainty of climate change (Government Participants 3 and 6) and the ecological complexity of the hydraulically connected Athabasca River and Peace River deltas (Government Participants 4, 6, 15, and 19).

was narrowed from the full length of the Lower Athabasca River, including its tributaries and delta distributaries, to just the Lower Athabasca River mainstem before the start of the delta (Franzin & IFNTTG, 2009). The narrowed geographic scope represented the area for which information was able to be collected within the time and resource constraints under which CEMA operated. Narrowing the geographic scope facilitated timelier completion of policy-making so that surface water quantity protections were in place before additional development of the oil sands occurred (Government Participants 3, 6, and 15). However, the Lower Athabasca River tributaries and delta excluded from the geographic scope were vital boating areas to MCFN and ACFN (Candler et al., 2010; GoA, 2015). When asked about how the excluded areas would be addressed, Government Participants indicated that "it may not be reopened" (Government Participant 2) to "there could be opportunities to work together [with MCFN and ACFN] to refine the Aboriginal Navigation Index" (Government Participant 3). The exclusion of areas important to MCFN and ACFN from the geographic scope of the SWQMFLAR combined with Government Participants' ambiguous commitments about how the excluded areas would be addressed in the future indicated uncertainty in whether the navigability for MCFN's and ACFN's waterscape would ever be factored into policy-making.

2. Uncertain impacts of oil sands water withdrawals on river navigability: The GoA framed the impacts of water withdrawals on river navigability for Indigenous uses as a non-urgent issue, resulting in river navigability being monitored rather than used as a criterion for establishing water withdrawal rules in the SWQMFLAR. Government Participants questioned whether oil sands water withdrawals impacted river navigability because "the impacts of the current withdrawal rates [on river levels] are relatively small" (GoA, 2015, p. 39; also Government Participants 6 and 15).[56] Further, some Government Participants surmised that the decline of

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[56] Indigenous river uses were incorporated as objectives into CEMA's work on the instream flow needs of the Lower Athabasca River during Phase 1, but to Government Participants, the extent to which surface mineable oil sands water withdrawals impacted Indigenous river navigability remained uncertain throughout policy-making. Studies on Indigenous river navigability were carried out during Phase 2 that concluded that the water withdrawal scenarios considered by the P2FC would not impact river navigability, but the study conclusions were disputed by Indigenous P2FC members. Indigenous P2FC members contended that the study sites inadequately represented navigability pinch points[56] known by Indigenous river users:

> it was deemed to be not very meaningful because the, the sites were picked somewhat at random and they were deemed to be not areas of concern. So, so that, you know, there was some preliminary work but the findings were not really accepted by the [Indigenous] communities. (Government Participant 3)

river navigability experienced by Indigenous peoples was being disproportionally attributed to oil sands water withdrawals because oil sands water mining activities ramped up at about the same time that dredging of the Athabasca River ceased:

> Regular dredging occurred on the Athabasca River in the late eighties to the mid-nineties. Oil sands developments started to expand five, ten years after the dredging stopped. The dredging ensured that navigability was easy for First Nations over many, many years. Once the dredging stopped, the perception of how much water was being used was driven by the ability to navigate. But the ability to navigate was at least as much impacted by the discontinuance of dredging activity as it was by water withdrawal. Without the dredging it would have appeared that navigability was going down. If people didn't understand how much dredging was contributing to navigability, then water withdrawals are easy to blame. (Government Participant 15)

Despite the uncertainty in the impacts of oil sands water withdrawals on river navigability, the GoA recognized that if the oil sands water withdrawals reached full build out levels, river navigability could be potentially impacted (GoA, 2015). Given that full build out would not be reached for many years, (Ohlson et al., 2010), the GoA decided to monitor the impacts of water withdrawals on river navigability to reduce uncertainty instead of imposing the AXF as a water withdrawal cut-off threshold (Government Participants 6 and 15). Reduced uncertainty was considered necessary before oil sands water withdrawal rules are changed because the GoA can only regulate activities that it can control:

> we look at the difference between the, the environmental conditions and what the flows are, and then...So with and without withdrawals, and look at the difference between those. Not the… flows without withdrawals, and whether or not that is – whether or not people can navigate at that stage but whether there is a change in navigability due to withdrawals. (Government Participant 3)

If, after monitoring, oil sands water withdrawals were observed to impact river navigability for Indigenous uses, then the water withdrawal rules in the SWQMFLAR could be revised. In short, oil sands water withdrawals at the time the SWQMFLAR was developed were not considered problematic for Indigenous river navigability; hence, the GoA would not impose water withdrawal cut-off thresholds based on river navigability until such time that an impact was observed.

The P2FC was unable to undertake additional studies using Traditional Knowledge held by the Indigenous river users due to their mandated timeline, and so categorized river navigability as a knowledge gap that required further monitoring (Government Participants 3 and 6; Ohlson et al., 2010).

6.2.7.3 Legitimacy

Legitimacy refers to the concern that organizations have about how they will be perceived if they adopt an innovation (Steelman, 2010). Government Participants described being concerned about how the GoA would be perceived if the ANF were adopted given the collaborative effort that went into the P2FC's recommendations. The GoA committed to using the P2FC recommendations at the start of Phase 2 as the foundation for SWQMFLAR development, and that commitment grew stronger because of the respect that Government Participants had for the outcomes of the P2FC structured decision-making process:

> I think that the process is a big part of arriving at a good conclusion. I can't emphasize enough that the process that was undertaken at the P2FC was unlike any other I had ever been through before or since…We agreed at the beginning to use the best available information and that positions had to be defended. **We didn't want people to take a line in the sand approach without being able to explain why**. Positions wouldn't be ignored or dismissed, and the group would support people as they defended their positions. We wanted solid questions to be asked because the group had funding to fill knowledge [gaps]. A lot of money was spent answering questions (Government Participant 15) (author's emphasis added).

Underpinning the Government Participants' respect for the P2FC recommendations was the P2FC's refusal to accept a "line in the sand approach" highlighted in the above quote that consisted of the promotion of single interest, entrenched positions closed to collaborative interrogation. To some Government Participants, the introduction of the ANF by MCFN and ACFN to federal and provincial governments outside of the P2FC was a "line in the sand approach" because there were no opportunities for collaborative interrogation of the ANF calculations or potential impacts of the ANF on other regional interests (Government Participant 15). Consequently, ANF were partially delegitimized by MCFN's and ACFN's self-marginalization:

> there were people who'd been involved with that over a period of time, and had built awareness and understanding, and came to collaborative agreement around that. And so there were concerns around having one particular interest lead to revising the weekly rules. And then not giving the opportunity for other kinds of factors to be considered as well. So there was a responsibility to the original [P2FC] process and the people who were part of that on the part of the organization. (Government Participant 3)

Additionally, the P2FC represented a partnership that included Indigenous peoples directly affected by oil sands development, and Government Participants did not want to be perceived as

favouring the submission of MCFN and ACFN over Indigenous peoples who had participated in the P2FC:

> Métis and Fort McKay First Nations were at that table. Fort McKay is right in the middle of the oil sands development. ACFN, MCFN are quite a bit further north of the oil sands development…When information is brought in from a parallel process late in the discussions, it makes it difficult to decide where it fits and how to incorporate that new information. Especially when that information hasn't been discussed at a table that included a very broad group of people, including other Métis and First Nations people (Government Participant 15).

In short, Government Participants were concerned that using the ANF instead of the P2FC recommendations to develop water withdrawal rules in the SWQMFLAR would be considered unfair to Indigenous P2FC members and non-transparent to P2FC members who engaged in collaborative interrogation and negotiation of interests. Some Government Participants indicated that adoption of ANF would have more legitimate if it had reflected the interests of all Indigenous peoples of the Lower Athabasca River region rather than just two Indigenous perspectives.

6.3 Summary

The third ESF dimension and the IIF were brought together in Chapter Six to understand Government and Community Participants' perspectives on the influences on GoA's adoption of ANF. Government and Community Participants identified keystone factors, the most influential factor on ANF adoption, and a range of individual, structural, and cultural institutional drivers and barriers that shaped the keystone factors. Understanding the two sets of perspectives is fundamental to establishing ethical space because it provides a foundation for finding commonalities amongst the perspectives (Ermine, 2007), which is the subject of the next chapter. To facilitate finding commonalties, the Community and Government Participants' perspectives were presented in identical formats based on the IIF in this chapter so that they could be directly compared. In short, the findings in Chapter Six serve as the data set for the comparison that happens in the next chapter.

CHAPTER 7 – RESULTS FOR RESEARCH QUESTIONS 2C AND 2D: COMPARING NARRATIVES TO FIND PATTERNS IN THEIR COMMONALITIES

Introduction

Chapter 7 presents the results for Research Questions 2c and 2d. Research Question 2c satisfies the fourth ESF dimension by asking what are the commonalities between the Government and Community Participants narratives (Chapter 6). The Government and Community Participant narratives described the IIF factors (e.g., motivation, incentives, legitimacy) that each group of participants considered to be influential on the GoA's adoption of the ANF. Using Charmaz's (2014) constant comparison methods, the keystone factors, barriers, and drivers constituting the two narratives were compared. Comparing the keystone factors, which were the most influential factors on the GoA's adoption of ANF from the perspectives of Government and Community Participants, provided insight into how the keystone factors from the two narratives were related to each other. Comparing the barriers and drivers that interacted to shape the keystone factors within the two narratives allowed for the identification of partial or full convergences within the Government and Community Participants narratives. Barriers and drivers that partially or fully converged are termed commonalities and indicate where areas of mutual cross-cultural understanding were starting to be achieved amongst Government and Community Participants on the influences on GoA's adoption of the ANF.

Research Question 2d aligns with the application of the IIF (section 3.3.4) by asking what are the patterns in the commonalities among Government and Community Participants' narratives at the IIF factor (e.g., motivation, resistance, legitimacy) and category (individual, structural, cultural) levels. The IIF factor level pattern consists of the relative degree of influence of each of the common barriers and drivers. To identify the relative degree of influence of the commonalities, Charmaz's (2014) constant comparison methods were combined with verbal cues (e.g., direct statements about factor influence such as "the hardest problem"), oral cues (e.g., how the participants' voices sounded), and the number of research participants that raised the factor. The IIF category level pattern consists of the relative influence of and alignment amongst the individual, structural, cultural categories of the IIF determined through

the use of Charmaz's (2014) constant comparison methods. Steelman (2010) observed that greater alignment amongst the IIF categories in their support of an innovation is likelier to result in an innovation that endures. Identifying patterns at the IIF factor and category levels provides insight into whether Government and Community Participants achieved a mutual understanding of the influences on the GoA's adoption of the ANF, and actions that they may take to foster dialogue leading to the advancement of the ANF in surface water policy in mutually acceptable ways.

Chapter 7 is laid out in three sections. In section 7.1, the keystone factors from the Community and Government Participants narratives are compared to understand how they are related. Section 7.2 identifies the commonalities between the Community and Government Participants narratives and the relative influence of each commonality to the adoption of the ANF. Section 7.3, the last section, describes the patterns in which the IIF factors and categories of factors occurred.

7.1   Comparison of the Keystone Factors

Government and Community Participants identified different but related keystone factors considered to be the most critical influences on the GoA's adoption of the ANF. Government Participants identified one keystone factor: framing at the cultural level of the IIF. Framing referred to the GoA's understanding of SWQMFLAR development as the need to reasonably integrate diverse interests in the flows of the Lower Athabasca River without losing sight of the GoA's desired outcomes for the oil sands industry. Community Participants identified two interacting motivations at the individual level of the IIF as the keystone factors. First, Community Participants perceived GoA representatives as fearing MCFN and ACFN as threats to the economic wealth generated by the surface mineable oil sands industry. The GoA's fear, Community Participants contended, caused GoA representatives to remain emotionally, intellectually, and physically distant from MCFN and ACFN citizens, which in turn, constrained the GoA's willingness to alter their economic priorities underpinning SWQMFLAR development. Second, Community Participants asserted that MCFN and ACFN were motivated by optimism, making them resolute in overcoming the GoA representatives' fear of the First Nations' intentions through advocacy for environmental protections and respectful consultation. Community Participants asserted that MCFN's and ACFN's advocacy was partially successful,

motivating the GoA to start considering Indigenous river uses in their development of the SWQMFLAR. Putting together the keystone factors identified by Government and Community Participants, the interaction between the motivations of GoA, MCFN, and ACFN at the individual level of the IIF shaped the GoA's framing of SWQMFLAR development at the cultural level of the IIF. Important to note is that Government Participants did not confirm whether they felt fearful towards MCFN and ACFN as described by Community Participants GoA, but Government Participants did confirm that their priority was to protect the economic wealth generated by the surface mineable oil sands industry.

7.2 Commonalities Between Government and Community Narratives

Ten common barriers and nine common drivers that interacted to shape the keystone factors were identified through the narrative comparison. Tables 7.5 (barriers) and 7.6 (drivers) present the commonalities among the Government and Community Participants' narratives in descending order of their relative influence on the adoption of the ANF. The most influential barrier and driver are located at the top of each table.

Table 7.1: Common barriers amongst the Government and Community Narratives

Commonality Label - Barriers	Implementing Innovation Framework Classification	Commonality Description
Protecting provincial wealth	structural level – resistance	The GoA resisted the imposition of water withdrawal cut-off limits on existing licensees due to their protectionist stance towards the energy and economic security provided by surface mineable oil sands development
Maneuvering rules for legacy projects	structural level – rules	Disagreement about the legal and policy options for establishing water industry-wide withdrawal cut-off thresholds persisted throughout policy-making. The GoA did not perceive the flows in the Lower Athabasca River to be an emergency issue and were concerned about the implications of reducing the senior licensees' water use rights. Conversely, MCFN and ACFN perceived their experiences with river flows as an emergency and argued that the GoA had the legal and policy authority to establish industry-wide water withdrawal cut-off thresholds. Due to the power imbalance between the First Nations and the GoA, the GoA could exercise its discretionary legislated authorities in ways that it chose.
Halting rights-based discussions	structural level – opening	The political structure was closed to rights-based discussions because the GoA preferred that ongoing questions about the extent and nature of and responsibilities toward Indigenous rights be resolved in the courts. Bounded discussions prevented MCFN and ACFN from fully conveying the implications of reduced river navigability on their citizens and the GoA from attributing the same meaning to the ANF as did the First Nations. Diverged meanings of the ANF caused the GoA to act in ways that did not align with MCFN's and ACFN's recommendations.
Incongruently relating river navigability, wellness, and surface water quantity management	individual level – intra- and inter-constellational congruence	Relationships among river navigability, human wellness, and surface water quantity management were defined differently amongst Government Participants and between Government and Community Participants. These incongruent definitions led to the GoA's underappreciation of the sense of urgency with which MCFN and ACFN introduced the ANF, justifying to the GoA the inclusion of monitoring provisions rather than water withdrawal rules for river navigability in the SWQMFLAR.
Building different paths to legitimacy	individual level – inter-constellational congruence in the Community Participant narrative / cultural level - legitimacy in the Government Participant narrative	Differing views on the participation status of MCFN and ACFN translated into different opinions on the legitimacy of the First Nations introducing the ANF outside of the collaborative. While MCFN and ACFN regarded the bilateral interactions with the GoA as appropriate given their status as rights-holders, the bilateral interactions partially delegitimized the ANF to some Government Participants because the ideas were not subjected to the same collaborative scrutiny as the P2FC recommendations.
Incongruently addressing incommensurable policy options	individual level - inter-constellational congruence	Due to their concerns about the commensurability of the ANF with the modelling approach used in the SWQMFLAR, the GoA unilaterally modified the ANF (e.g., the GoA modified the river flow corresponding to the zero point for river navigability). The GoA's unilateral modifications of the ANF were considered unethical by the First Nations because people outside their communities translated their

Commonality Label - Barriers	Implementing Innovation Framework Classification	Commonality Description
		ideas in ways that to MCFN and ACFN rendered the policy ineffectual at meeting their interests. Conversely, the GoA perceived the modifications as necessary to align with their modelling approach to policy development and committed to revising the SWQMFLAR if monitoring data supported a change in the water withdrawal rules.
Incongruently prioritizing different knowledges	individual level - inter-constellational congruence	The GoA trusted the quantitative scientific conclusions that oil sands water withdrawals were insignificantly impacting river flows while MCFN and ACFN trusted their experiential-based Traditional Knowledge that stated river flows were being impacted. The different valuations of the knowledge systems resulted in the GoA perceiving river navigability as a less urgent issue than did MCFN and ACFN. Consequently, the GoA addressed river navigability within the monitoring provisions rather than in the water withdrawal rules contained with the SWQMFLAR.
Narrowing the geographic problem scope	cultural level - framing	Over time, the geographic scope of the surface water quantity problem addressed by the different phases of water policy development was narrowed to only the Lower Athabasca River mainstem, excluding the tributaries and the Peace Athabasca Delta. The narrowed geographic scope reduced the biophysical complexity of the policy problem, enabling timelier completion of the SWQMFLAR but also masking the full range of the socio-cultural impacts of oil sands water withdrawals on MCFN and ACFN. The hidden impacts prevented the GoA from understanding the urgency underpinning the First Nations' promotion of the ANF, which contributed to the GoA's translation rather than direct use of the ANF.
Regulating by blame apportionment	cultural level - framing	The GoA was mandated to develop policy that regulated consumptive freshwater uses to help prevent degradation of the aquatic ecosystems of the Lower Athabasca River. Community Participants described this regulatory approach as "blame" focussed that is prohibitive to achieving the First Nations' interests because it prevented the GoA from imposing water withdrawal cut-off limits on senior and existing licensees until there was proof that industrial water withdrawals, rather than climate change or another factor, were the cause of changing river flows. Community Participants asserted that the GoA should regulate industrial water withdrawals to restore flows in the Lower Athabasca River regardless of the cause of the problem. The GoA recognized MCFN's and ACFN's perspectives but asserted that they were limited in what could be done under Alberta's *Water Act*. Hence, monitoring for the impact of climate change on river flows were incorporated into the SWQMFLAR's adaptive management program.
Being hindered by a narrow regulatory framework for navigation	structural level - rules	The legal framework within which federal and provincial governments could act upon ANF was limited at the federal level because the impacts of industrial water withdrawals on river navigability were outside the scope of the *Navigation Protection Act* in force in 2010. Consequently, MCFN and ACFN were constrained in the avenues they could use to address their river navigability concerns.

Table 7.2: Common drivers amongst the Government and Community Narratives

Commonality Label - Drivers	Implementing Innovation Framework Classification	Commonality Description
Collective communicating to be heard	structural level - communications	Persistent, consistent, and joint communications by MCFN and ACFN, with assistance from allied western scientists*, kept the First Nations' river navigability interests at the forefront of discussions during the final phase of policy development so that government representatives had to act on the ANF.
Strengthening legal protections for rights	structural level - rules	Evolving rules, including constitutional law, common law, and policy requirements, created space for MCFN and ACFN to share their perspectives on surface water quantity policy-making for the Lower Athabasca River. These rules created that space because they required the GoA to (i) recognize MCFN's and ACFN's rights as treaty signatories; and (ii) meet consultation obligations.
Leveraging extant openings	structural level - opening	The shared stewardship model adopted by the GoA for freshwater resources opened surface water quantity policy-making to diverse interest holders. MCFN and ACFN took advantage of the participation opportunities by becoming involved in CEMA and developing and promoting the ANF so that their river uses could be accommodated in the policy.
Seeking a progressive reputation	cultural level - legitimacy	To help secure the marketability of oil sands products, the GoA sought to legitimize its regulation of oil sands mining partly by promoting the SWQMFLAR as an inclusively developed surface water quantity policy that facilitated ongoing performance of Indigenous river uses. The GoA did invest time and staffing resources to evaluate the ANF, creating an opportunity for the First Nations to share and clarify their interests. However, Community Participants asserted that the GoA's efforts were insincere, and therefore not legitimate, because MCFN's and ACFN's interests were only superficially met.
Resituating socio-cultural goals	cultural level - framing	Space for Indigenous river uses in policy development was created when the relationship between social, cultural, environmental, and economic goals was reframed by the GoA in response to the First Nations' advocacy efforts. The GoA's reframing caused the scope of policy-making to expand because social and cultural goals were recognized as being related to but separate from economic and environmental goals.
Accepting policy-making as an inclusive, values laden endeavour based on knowledge	Individual level - intra- and inter-constellational congruence	Community and Government Participants agreed that policy-making is a subjective endeavour supported by information to integrate the social, cultural, environmental, and economic interests held by diverse peoples. Perceiving policy-making as subjective and inclusive created the openness necessary to address the GoA's, MCFN's, and ACFN's socio-cultural goals related to community wellness.
Building momentum through creativity	individual level - norms & harmony in the Community Participant narrative / structural level - incentives in the Government Participant narrative	Creativity was considered essential for capturing Indigenous interests in policy-making by the Government and Community Participants, although Community Participants disagreed that the GoA demonstrated this characteristic. First Nations used their creativity to find ways to increase the effectiveness of their participation in natural resource management, including the mobilization of their Traditional Knowledge to develop the ANF. GoA representatives employed creativity to find ways to use the ANF in policy-making and this provided them with a sense of satisfaction and accomplishment that fueled further creativity in a positive feedback loop.

Commonality Label - Drivers	Implementing Innovation Framework Classification	Commonality Description
Incentivising participation through resource sharing	structural level - incentives	Resource sharing (information and funding) facilitated Indigenous participation in surface water quantity policy-making, although Community and Government Participants agreed that this was not a key facilitator.
Acting on common water worries	cultural level - shocks	Low water levels in the Lower Athabasca River raised concerns amongst Indigenous peoples, government, and industry, prompting them to initiate surface water quantity policy-making to prevent degradation of the aquatic ecosystem.

* First Nations' use of allied western scientists is categorized as a driver in the commonality tables because of their useful roles described by both Community and Government Participants, but some Community Participants also described how they can create challenges with communication pathways internal to the First Nations. Allied western scientists were vital in facilitating the development of knowledge products (e.g., *As Long as the Rivers Flow Report*; reviews of draft policy documents) and knowledge exchange between the First Nations and government representatives to foster mutual learning. These are recognized functions of "knowledge brokers", defined in the policy studies as individuals acting at the knowledge-policy interface to produce and translate knowledge, build capacity, and establish communications channels (Maag et al., 2018; Rantala et al., 2017). Knowledge brokers are generally perceived as helpful and academics are turning their attention towards understanding how that role can be improved. In the Indigenous governance literature, people who are taking on somewhat similar roles are called allies of Indigenous peoples (Garbutt, 2019; Osborne et al., 2019). The literature on allies, which is beginning to grow, identifies the characteristics that successful allies require, emphasizing that allies must be good and humble listeners who create opportunities for Indigenous peoples to speak for themselves. Allies must also not speak over Indigenous peoples (Garbutt, 2019; Osborne, Chaze & Williams, 2019), but to some citizens of MCFN and ACFN this sometimes happened, causing instances where the allies did not fully understand or convey the citizens' perspectives. Despite these challenges, there was no indication from Community Participants that allied western scientists should not assist the First Nations in their endeavors related to surface water quantity policy-making. Rather, there was a desire to raise awareness of the challenges within MCFN's and ACFN's own governance structures so that interactions between the allies and First Nations citizens can be improved. Hence, the use of allied western scientists was considered a beneficial approach in this research. However, the challenges with using allied western scientists suggests that the literatures on knowledge brokers and allies could be joined to better understand when and how knowledge brokering may be (unintentionally) harmful.

7.3 Patterns in the Factors

Application of the IIF included identifying two types of patterns, including the overall (mis)alignment amongst IIF categories (individual, structural, cultural) and the patterns in which the commonalities between the Government and Community Participant narratives occurred.

Overall (mis)alignment amongst IIF categories: Similar to Steelman's (2010) approach for presenting (mis)alignment amongst factors, the factors (keystone factors and commonalities from Tables 7.1 and 7.2) that influenced ANF adoption were assigned a "+" if they were a driver of ANF adoption and a "-" if they were a barrier to ANF adoption (Table 7.3). IIF factors that acted as barriers and drivers to ANF adoption are indicated by "+/-". This approach to presenting the (mis)alignment amongst the factors used in Table 7.3 is like that used by Steelman (2010). Table 7.3 indicates that the three IIF categories of factors were partially aligned in their support of ANF adoption, with factors in each category acting as barriers and drivers to ANF adoption.

Table 7.3: Partial alignment in the IIF factors influencing ANF adoption

Individual Factors		Structural Factors		Cultural Factors	
motivation	+	rules	+/-	shocks	+
norms & harmony	+	communications	+	framing	+/-
intra-constellational congruence	+/-	incentives	+	legitimacy	+/-
inter-constellational congruence	+/-	opening	+/-		
		resistance	-		

Patterns in which the commonalities occurred: To assist with identifying the patterns in the commonalities between the Government and Community Participant narratives at the IIF category and factor levels, the column titled "Implementing Innovation Framework Classification" from Tables 7.1 and 7.2 have been condensed into Table 7.4 below. The factors are presented in descending order of their relative influence on the adoption of the ANF. The most influential barrier and driver are located at the top of the table.

Table 7.4: Relative influence of the common barriers and drivers to the adoption of ANF

Relative Influence on ANF Adoption	Barriers to ANF Adoption		Drivers to ANF Adoption	
	IIF Category	IIF Factor	IIF Category	IIF Factor
Increasing influence on ANF adoption ↑	Structural	Resistance	Structural	Communications
	Structural	Rules	Structural	Rules
	Structural	Opening	Structural	Opening
	Individual	Intra and inter-constellational congruence	Cultural	Legitimacy
	Individual / Cultural	Inter-constellational congruence / Legitimacy	Cultural	Framing
	Individual	Inter-constellational congruence	Individual	Intra and inter-constellational congruence
	Individual	Inter-constellational congruence	Individual / Structural	Norms & Harmony / Incentives
	Cultural	Framing	Structural	Incentives
	Cultural	Framing	Cultural	Shocks
	Structural	Rules		

Based on Table 7.4, three patterns in the commonalities between the Government and Community Participant narratives were identified, with each pattern consisting of IIF category (individual, structural, and cultural) and factor (e.g., congruence, rules, framing) level components. Specifically, the patterns observed were the following:

1. The structural category was the most influential category of barriers and drivers in both narratives. At the factor level, the patterns in the structural level commonalities were the following:
    i. Resistance was the most influential barrier to the use of the AXF as a water withdrawal cut-off limit in the SWQMFLAR.
    ii. Communications was the most influential driver to the inclusion of river navigability monitoring provisions in the SWQMFLAR.
    iii. Rules and opening were the second most influential structural level factors for both the barriers and drivers.

2. Intra- and inter-constellational (in)congruences at the individual level were more influential barriers than framing at the cultural level. No other factors at the individual or cultural levels were common barriers.

3. Cultural level factors were more influential drivers than individual level factors. Legitimacy and framing followed by shocks were influential cultural drivers. Intra- and inter-constellational congruence and norms and harmony were influential individual level drivers.

7.4 Summary

The results show that, to Government Participants, the GoA's framing of policy-making was the keystone barrier influencing ANF adoption but that, to Community Participants, MCFN and ACFN were motivated to shift the GoA's economic priorities for the Lower Athabasca River region so that river navigability protections would be included in the SWQMFLAR. A comparison of the Government and Community Participants narratives revealed 19 commonalities between the Government Participant narrative and the Community Participant narrative that shaped the keystone factor. Together, the keystone factors and 19 commonalities occurred across all three IIF categories (individual, structural, cultural) which were partially aligned in their support of the ANF. The pattern in the commonalties, which are the IIF factors that shaped the keystone factors, revealed that structural factors were the most influential barriers and drivers and were reinforced primarily by cultural drivers and individual barriers.

CHAPTER 8 – DISCUSSION AND CONCLUSION

8.0 Introduction

Chapter Eight discusses the findings of this study by weaving together a synthesis of the findings from Chapters Four to Six, commentary on relevant literature, and my own interpretive perspectives to answer both sets of research questions. In providing this discussion, the fourth ESF dimension under which perspectives are interrogated is advanced to help achieve mutual cross-cultural understanding (Ermine, 2007) of the significance and adoption of ANF.

In section 8.1, Research Question 1 findings are discussed: *Why are ANF significant to the Indigenous communities that helped develop them?* To understand the significance of ANF, the importance of river navigability to the Indigenous peoples of the Peace-Athabasca Delta and the purpose of ANF were explored. The findings for Research Question 1 are evaluated and interpreted using literature on the emergence and benefits of cultural flows and their relationship to environmental flows in combination with insights into collaboration between Indigenous peoples and federal and provincial governments from Canadian freshwater governance literature. Combining the cultural and environmental flows literatures is appropriate because ANF represent a cultural flows example that informed an environmental flows assessment (described as determining the instream flows needs by the GoA) for the Lower Athabasca River. MCFN and ACFN were unaware of cultural flows as a defined policy concept when ANF were introduced but cross-cultural environmental flow assessments involving Indigenous peoples are becoming more commonplace in Canadian freshwater governance arenas. Thus, insights into the challenges of and appropriate practices for bringing Indigenous peoples and their knowledge systems into federal and provincial government led freshwater governance arenas helps convey the significance of ANF.

In section 8.2, Research Question 2 findings are discussed: *How can adoption of ANF in surface water quantity policy be advanced in ways mutually acceptable to state governments and Indigenous peoples?* Through the discussion on Research Question 2, findings on the influences on the adoption of ANF by the GoA are evaluated and explained using literature on the emergence, adoption, and implementation of environmental flows and Indigenous peoples' experiences within freshwater governance. Specifically, explanations are provided for the

keystone factors, commonalities between the Government and Community Participants' narratives, and the patterns in which commonalities between the Government and Community Participant narratives occurred.

In section 8.3, measures are recommended based on the discussion in section 8.2 to help facilitate the advancement of the ANF in surface water quantity policy in ways mutually acceptable to federal and provincial governments and MCFN and ACFN.

In section 8.4, suggestions for future research stemming from the discussion of the findings provided for both research questions.

In section 8.5, the research is evaluated using Charmaz's (2014) four interdependent criteria, including credibility, originality, resonance, and usefulness, because constructivist grounded theory methods guided explorations into both sets of research questions.

In section 8.6, the last section, concluding thoughts are provided, including a synthesis of sections 8.1 to 8.5 so that the research questions are succinctly answered, key findings and practical recommendations are provided, and the significance of the research is highlighted.

8.1   Significance of Aboriginal Navigation Flows

Why the ANF are significant to the Indigenous peoples living in the Peace-Athabasca Delta is clear; the findings as analyzed by the author show that ANF were intended as a translative bridge between the surface water quantity policy needs of MCFN and ACFN and the GoA in ways that honoured their treaty relationship so that MCFN's and ACFN's collective wellness could be sustained. For Community Participants, "wellness" is the agency to deal with change in their preferred ways that depends on sustaining their collective identity grounded in kinship within and amongst the citizenries of MCFN, ACFN, and FCM as well as symbiotic caring between the waterscape and people. Kinship and symbiotic caring were in turn dependent on the Community Participants' boating capabilities for interrelated social, spiritual, and economic purposes that in part were dependent on river navigability. Therefore, river navigability was found to be an agent of wellness through the relationship linking boating, kinship, symbiotic caring, identity, and ability to continue through change. Community Participants explained that to them the complex relationship between river navigability and wellness would be secured if federal and provincial governments honoured treaty rights by maintaining the health of the waterways, recognizing that treaty rights have priority over rights

issued under colonial legal systems, and that treaty rights are altered in practice. Community Participants also perceived MCFN and ACFN as having treaty responsibilities to explain their interests in freshwater perspectives on treaty rights (e.g., how treaty rights may be impacted by federal and provincial government activities) in ways understandable by federal and provincial governments. Therefore, ANF functioned as a translative tool that conveyed MCFN's and ACFN's interests and positions to federal and provincial governments in ways that, to Community Participants, respected the Treaty No. 8 relationship and the strength of their own knowledge to find solutions.

Collectively, the findings show that cultural flows can contribute to making environmental flows assessments for free-flowing rivers meaningful to some Indigenous peoples in five ways:

1. Encouraging ontological multiplicity in environmental flow assessments through the translational function of cultural flows.

2. Achieving Indigenous wellness through cultural flows by accounting for vital capabilities.

3. Recognizing that the exercise of treaty rights as expressed through cultural flows can be a means through which some Indigenous peoples secure their ability to adapt to environmental and social change.

4. Recognizing cultural flows as an opportunity for Indigenous peoples to fulfill their responsibilities to other Indigenous or settler peoples.

5. Capitalizing on the benefits that Indigenous peoples may experience from participating in cultural flow assessments by incorporating opportunities for Indigenous peoples to carry out cultural flow assessments as part of the design of environmental flow assessments.

The five above-listed actions are discussed in sections 8.1.1 to 8.1.5 and informed the explorations for Research Question 2 that are discussed in section 8.2.

8.1.1 Encouraging Ontological Multiplicity in Environmental Flow Assessments through the Translational Function of Cultural Flows

This study found that ANF are a translative tool that conveys MCFN's and ACFN's freshwater interests in hydrological terms that to Community Participants should be understandable and useable by federal and provincial governments, a finding that aligns with

how cultural flows are defined in other jurisdictions such as Australia (Weir, 2009) and New Zealand (Tipa & Associates, 2018). Although not a new finding, the translative function of cultural flows within environmental flow assessments is informative for addressing freshwater conflicts in Canada. Starting with the contention of some Canadian researchers that cross-cultural freshwater conflicts are rooted primarily in differences in Indigenous and federal and provincial government freshwater ontologies (Baker & Westman, 2018; Wilson & Inkster, 2018; Yates et al., 2017), Canadian freshwater governance needs to move away from ontological hegemony and towards ontological multiplicity. Embracing multiple ontologies within freshwater governance rests first on accepting divergent ontologies as different but literal truths (Wilson & Inkster, 2018; Yates et al., 2017) followed by accepting that divergent freshwater ontologies may be brought together (Anderson et al., 2019). Community Participants described how MCFN and ACFN were able to bring together their symbiotic freshwater-as-living being ontology with the differing freshwater-as-sustainable resource ontology of federal and provincial governments as part of their adaptation to establishing the instream flow needs and water withdrawal rules for the Lower Athabasca River.

A risk of ontological multiplicity within cross-cultural environmental flow assessments is "homogenizing translation" that renders some ontologies dominant and visible, and others marginalized and hidden (Lavau, 2013, p. 429). A parallel to homogenising translation is found in Canadian freshwater governance in which Traditional Knowledge is often disassembled and distilled (Castleden et al., 2017; Curran, 2019) such that its meanings change and existing power structures are reinforced (Abu, 2017). Since Traditional Knowledge should not be disassembled and distilled to preserve the integrity of its meaning (Castleden et al., 2017; Curran, 2019), cultural flows should be treated as indivisible translations from which components cannot be extracted for use in environmental flow assessments unless considered appropriate by the Indigenous peoples who undertook the cultural flow assessment. Keeping quantified cultural flows whole or only changing with in collaboration with their Indigenous creators will help foster ontological multiplicity.

8.1.2 Achieving Indigenous Wellness through Cultural Flows by Accounting for Vital Capabilities

MCFN's and ACFN's aspiration for the adoption of ANF is achieving collective wellness of their citizenries, which is unsurprising because wellness is a commonly identified outcome of cultural flows for Indigenous peoples (MLDRIN, 2007; National Cultural Flows Research Project, 2020). However, the findings specific to ANF extend existing knowledge by specifying a pathway through which Indigenous wellness is dependent on river flows, a gap that remains in the literature. To Community Participants, the dependency pathway connecting river flows and wellness conveyed through ANF included boating as a vital skill reliant on contextualized knowledge gained through knowledge sharing enabled in part by superior river navigability. Boating, then, can be considered to be much more than a recreational pursuit despite often being categorized as such in typologies of the goods and services provided to people by ecosystems (e.g., Sun et al., 2019). Changing perceptions of boating so that it is recognized as a vital, contextualized skill fostering wellness rather than simply recreation has implications for freshwater governance. Contextualized skills understood to be distinct and vital capabilities are more likely to be valued by state governments in trade-off evaluations (Kaltenborn et al., 2017). Broader society benefits from elevating vital capabilities in trade-off evaluations because the capabilities are often borne from the specific natural characteristics of an area (Kaltenborn et al., 2017). If those vital capabilities are preserved, the integrity of a socio-ecological system will be maintained, and the full suite of benefits of the functioning socio-ecological system will continue to be enjoyed across geographic scales (Sangha et al., 2018). In that way, the wellness of all peoples, not just Indigenous peoples, who depend on river flows can be sustained through cultural flows that account for vital capabilities such as boating.

8.1.3 Enhancing Indigenous Peoples' Adaptive Capacity through Cultural Flow Assessments

How MCFN and ACFN framed and introduced ANF correspond to broader patterns in the emergence of cultural flows in other jurisdictions such as Australia and Indigenous peoples' response to their inability to meaningfully participate in state government led natural resource governance. When Indigenous peoples are unable to participate in natural resource governance

in ways meaningful to them, Indigenous peoples often choose to disengage from collaborative processes and take positions grounded in their Indigenous rights (Bullock et al., 2020). Many Indigenous peoples such as MLDRIN are asserting their inherent rights as first peoples of a nation to counteract their ongoing neglect in state government led freshwater governance (Jackson, 2017; MLDRIN, 2007). Despite being unaware of cultural flows as a defined concept, MCFN and ACFN continued the response pattern, framing ANF as Aboriginal and treaty rights protections and introducing them directly to federal and provincial governments after refusing to participate in CEMA in protest of what Community Participants perceived as a governance structure that afforded them little influence.

Grounding cultural flows in treaty rights recognition and protection seeks to provide Indigenous peoples with some control over how freshwater is used within their territories (Weir, 2009; Jackson & Langton, 2011), but this study also shows a different reason for seeking treaty rights recognition through cultural flows that is not explicitly discussed in the environmental or cultural flows literatures. This study found that MCFN's and ACFN's self-determined ability to adapt to social and environmental changes is partly secured by exercise of their treaty rights in ways meaningful to them. Self-determined change adaptation is not explicitly identified as a value, dependency, or component of cultural flows except for Mackenzie et al.'s (2017a) encouragement to consider trends and drivers of current environmental and social change in cultural flow assessments as part of establishing Indigenous peoples' aspirations for a place (e.g., commercial development; designation as a wetland of international importance under the Ramsar Convention). Given that "climate change and social effects of this global phenomenon are one of the main problems of the 21st century" (Filippova, 2020, n.p.), understanding how cultural flow assessments can explicitly address and inform self-determined change adaptation will be helpful.

8.1.4 Recognizing Cultural Flows as an Opportunity for Indigenous peoples to Fulfill their Responsibilities to other Indigenous or Settler Peoples

Community Participants expressed a need to tend to their treaty partner responsibilities, an unsurprising finding due to the nature of Crown-Indigenous treaties but one that is little explored

in the cultural and environmental flows literatures. Indigenous treaty partners[57] are responsible for identifying how federal and provincial government activities may impact their Aboriginal and treaty rights and related interests, sharing information to support their impact claims and related concerns, and work with federal and provincial governments to resolve concerns in ways mutually satisfactory ways (Ministry of Aboriginal Relations, 2013; Department of Aboriginal Affairs and Northern Development Canada, 2011). To Community Participants, they were able to fulfill their treaty partner responsibilities by providing the *As Long as the Rivers Flow Report* (described impacts with supporting information) and introducing ANF (suggesting solutions to resolve concerns) to federal and provincial governments along with an invitation to federal and provincial governments to work with MCFN and ACFN on refining the ANF (cooperation with federal and provincial governments to find mutual solutions). Additional explorations into how cultural flow assessments and the introduction of quantified cultural flows can contribute to fulfilling Indigenous peoples' responsibilities towards state governments or peoples of other cultures are warranted because treaties continue to be negotiated in Canada, treaty relationships continue to be defined through common law (Poelzer & Coates, 2015), and because Indigenous wellness depends on all of humankind living in balance with each other (FNIGC, 2012).

8.1.5 Recognizing the Benefits that Indigenous Peoples can Experience by Participating in Cultural Flow Assessments

Findings show that Community Participants benefitted from the act of participating in the cultural flow assessment leading to ANF because they reaffirmed their own knowledge as the foundation for conveying their interests. The Community Participants' affirmation of knowledge is like the rejuvenated knowledge exchange pathways and increased confidence that Indigenous peoples in Australia (Mackenzie et al., 2017b) and New Zealand (Tipa & Associates, 2018) experienced by engaging in cultural flow assessments. Indigenous peoples, even when they play an influential role, often do not experience similar affirmation of their knowledge when they participate in environmental flow assessments focussed on ecological criteria derived from

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[57] All Aboriginal peoples in Canada have a "have a reciprocal duty to participate in reasonable [consultation] processes and Crown efforts to consult and accommodate them" (Department of Aboriginal Affairs and Northern Development Canada, 2011, p. 18), but the focus is on treaty partners in this research because MCFN and ACFN are signatories to Treaty No. 8.

Western Science (Mackenzie et al., 2017b). Emphasizing only ecological criteria misses interests that are important to Indigenous peoples (Finn & Jackson, 2011). The varied interests derived by Indigenous peoples and how they experience cultural flow assessments and environmental flow assessments creates opportunity to effect change for Indigenous peoples through the design of environmental flow assessments on two levels. First, objectives of environmental flow assessments can be opened to accommodate Indigenous peoples' interests beyond ecological health (Finn & Jackson, 2011). Second, the social process of environmental flow assessments can be designed to enable Indigenous peoples to complete their own cultural flow assessments and use that knowledge to inform environmental flow assessments. Deliberately designing environmental flows assessments to benefit Indigenous peoples by accommodating their diverse interests, needs and values and creating space for them to lead their own cultural flow assessments demonstrates respect for Indigenous peoples as self-determining nations. Positioning Indigenous peoples as self-determining nations increases the likelihood that they will remain willing to participate in Canadian cross-cultural governance arenas (Bullock et al., 2020; von der Porten & de Loë, 2013).

8.2 Advancing Cultural Flows in Surface Water Quantity Policy for Free-flowing Rivers

Given that the three categories of IIF factors, including the individual, structural, and cultural categories, were found in this study to be partially misaligned in their support of the ANF, the GoA's partial rather than full adoption of the ANF is unsurprising. Innovations are more likely to be adopted and endure when the IIF factors are aligned in their mutual support of the innovation (Cook, 2014; Steelman, 2010). Consequently, to advance the adoption of ANF in surface water quantity policy in ways that are mutually acceptable to federal and provincial governments and MCFN and ACFN, the misalignment in the three IIF categories needs to be corrected. Actions that can be undertaken to align the categories of IIF factors in their support of full ANF adoption are revealed through the IIF factors and the patterns in which the IIF factors occur.

8.2.1 Discussing the Keystone Barrier: Bounded Inclusivity to Preserve Economic Priorities

To Government Participants, the GoA's frame for policy-making, which was the reasonable integration of diverse interests in the flows of the Lower Athabasca River without losing sight of the GoA's desired outcomes for the oil sands industry, was shown in this study to be the keystone barrier to the adoption of the ANF. Stated differently, the GoA rendered policy-making into what I term a form of bounded inclusivity that integrated diverse interests only to the extent that they did not interfere with the GoA's pre-determined economic goals for the region.

The GoA's approach to policy-making is a finding consistent with the observed tendency for state governments to retain authority when introducing decentralized, networked governance (Kim, 2016). In this case, the GoA retained its authority for making surface water quantity policy but still provided technical information and policy-based suggestions to the collaborative CEMA and P2FC. To the GoA, respecting their dual roles meant excluding themselves from the P2FC's deliberations on its final recommendations, but they still critically shaped those recommendations by influencing the strategies considered by the P2FC as it generated and evaluated rule options (Ohlson et al., 2010). When operating within collaborative governance structures where state governments retain authority, participant groups often are constrained in the strategies available to them to achieve their desired outcomes (Kim, 2016; Swyngedouw, 2005). The pitfalls of networked governance structures are a necessary area of research, especially given the increasing use of collaborative arrangements for freshwater governance.

This study showed that the GoA framed policy-making as the need to not lose sight of provincial objectives for the oil sands industry, a finding consistent with observed obstacles to environmental flows globally (La Quesne et al., 2010). When economic stakes are high, state governments are often reluctant to adopt environmental flows because of the potential need to reduce or reallocate existing water rights and constrain future uses (La Quesne et al., 2010; Weir, 2009). The GoA has adopted policy supporting environmental flows, but the underpinning standpoint on freshwater in the province is the protection of existing water rights, which Unger (2019) describes as "providing certainty in water allocations authorized by licenses" (p. 15). In the terminology of the IIF, the orientation towards protecting existing licenses is resistance, and

it is resistance that was shown in this study to the most influential IIF factor shaping how policy was framed by the GoA.

Given the GoA's resistance, proposals to impose a water withdrawal cut-off threshold on all existing oil sands developments through the SWQMFLAR were contentious throughout the entire three phases of policy-making. ANF, which consisted of a water withdrawal cut-off threshold, were at first disregarded by the GoA, but Government and Community Participants described how MCFN's and ACFN's communications were fundamental to increasing the GoA's receptiveness to the ANF. MCFN's and ACFN's communications were consistent, persistent, unified, and came through a strong governance structure supported by allied scientists. This finding on Indigenous communications echoes the Ngarrindjeri's self-determined and self-organized strategies for interacting with state governments in Australia (e.g., governance structures; securing water and a role in water governance through political negotiations; academic publishing) that have influenced freshwater management in the Murray Darling Basin (Hemming et al., 2019). Although MCFN's and ACFN's communications started to break down the GoA's resistance, that resistance could not be fully overcome, leading to the GoA's use of ANF to develop river navigability monitoring provisions but not to impose a water withdrawal cut-off limit.

8.2.2 Discussing the Overall Pattern Observed in the Commonalities between the Government and Community Participant Narratives

While all IIF categories influenced ANF adoption, two arrangements of factors within this study's overall pattern are observed: (i) the dominance of structural *barriers and drivers* to ANF; and (ii) structural and cultural factors were shown to be more influential *drivers* and structural and individual factors were shown to be more influential *barriers*. These two factor arrangements are discussed next.

8.2.2.1 Dominant Influence of Structural Barriers and Drivers

The dominance of structural drivers and barriers found here is discernible in studies identifying barriers and drivers to the adoption and implementation of environmental flows by Harwood et al. (2018), La Quesne et al. (2010), and Moore (2004) (collectively termed the previous studies for this section only). The previous studies did not apply the IIF and are not

grounded in the literatures Steelman (2010) used to develop the IIF but, when the barriers and drivers in the previous studies are categorized using the IIF, structural factors appear to dominate influences on the adoption and implementation of environmental flows. Specifically, the structural factors identified in the studies on the barriers and drivers to the adoption and implementation of environmental flows include: lack of political will (resistance) (La Quesne et al., 2010; Moore, 2004); supportive legislation, policy, and standards (rules) (Harwood et al., 2018; La Quesne et al., 2010; Moore, 2004); funding and technical capacity (incentives) (Harwood et al., 2018; La Quesne et al., 2010; Moore, 2004); collaboration with diverse interest holders (opening); and information availability and exchange that fosters learning (communications) (Harwood et al., 2018; La Quesne et al., 2010; Moore, 2004). The only non-structural factors identified in the studies were the need for champions to facilitate action (motivation) (Harwood et al., 2018) and political, stakeholder and public support (legitimacy) (Harwood et al., 2018; La Quesne et al., 2010; Moore, 2004). Further research is needed before conclusions can be drawn about the relative influence of each of the IIF categories and factors to the adoption and implementation of environmental flows, but the cursory application of the IIF to the previous studies combined with the findings from this research suggest that structural factors are instrumental to the advancement of cultural and environmental flows within freshwater governance arenas.

The simultaneous presence of dominant structural barriers and drivers in this study is indicative of tensions underpinning ANF adoption. Structural factors are influenced from the bottom-up by individual people's motivations, norms, and values (Asriadi et al., 2019; Steelman, 2010) and top down by the political, historical, geographical and cultural contexts from which they emerge (Indset, 2018). As the broader contexts evolve, so too can the structural factors shaping innovation adoption (Leiren & Reimer, 2018; Indset, 2018), but the evolution of structures can take time (Leiren & Reimer, 2018), creating situations where structures exhibit new and old characteristics (Indset, 2018; Pierson, 2004). People navigating transitioning structures interact with rules, communication modes and pathways, political structures, and power relationships in ways favourable to their goals. Individuals who benefit from the status quo grapple with changes in structures and broader cultural contexts within which they work, resisting innovations. Conversely, individuals discontent with the status quo act to reinforce structural and contextual changes, embracing innovations (Indset, 2018; Pierson, 2004;

Steelman, 2010). Although, in this study, barriers and drivers occurred within all three IIF categories, structural factors primarily interacted with individual barriers and cultural drivers, creating circumstances in which ANF adoption was both supported and resisted. Consequently, the ANF were adopted by the GoA but in a modified form.

8.2.2.2   *Cultural Drivers Unsupported by Individual Barriers*

In this study, cultural factors were found to be more influential *drivers* than individual factors and individual factors were found to be more influential *barriers* than cultural factors. While the patterns in the cultural and individual factors cannot be compared directly to other studies because this is the first application of the IIF to the adoption of cultural and environmental flows to my knowledge, the patterns do appear to corroborate experiences in other colonial-settler jurisdictions. For instance, in Australia, recognition of past injustices to Indigenous peoples and disparities in the socioeconomic conditions between Indigenous and non-Indigenous communities (cultural factors) manifested, in part, in calls to enhance Indigenous peoples' participation in freshwater governance (Tan & Jackson, 2013). However, many non-Indigenous people involved in freshwater governance such as state government representatives often did not understand Indigenous interests, how to translate Indigenous interests into water volumes or discharges (Jackson et al., 2011; Tan & Jackson, 2013), or assumed that the ecological objectives they established for environmental flows would fully meet Indigenous interests (Finn & Jackson, 2011). Using the terminology of the IIF, the Australian example can be restated as cultural shifts are increasing the recognition of Indigenous peoples, encouraging state governments to, in part, enhance Indigenous peoples' place within freshwater governance, but individuals within state governments are grappling with incongruencies between their and Indigenous peoples' ways of knowing and being in the world. The Australian experience is somewhat like that found here: Government and Community Participants recognized societal expectations for Indigenous peoples in freshwater governance, but they grappled with incongruent perspectives on the respectful use of Traditional Knowledge by state governments and engagement pathways between state governments and Indigenous peoples. Generalizable conclusions about the relative influence of individual and cultural factors to cultural flows adoption cannot be made without a more fulsome data set and analysis, but together, the Australian example and the findings here point to how individual barriers are impeding cultural

drivers that help overcome the marginalization of Indigenous freshwater interests, at least in some cases.

To overcome individual barriers such that individual factors support cultural drivers that help overcome the marginalization of Indigenous peoples, the implementation of Truth and Reconciliation Commission Call to Action #57 is suggested (Truth and Reconciliation Commission, 2015):

> We call upon federal, provincial, territorial, and municipal governments to provide education to public servants on the history of Aboriginal peoples, including the history and legacy of residential schools, the United Nations Declaration on the Rights of Indigenous Peoples, Treaties and Aboriginal rights, Indigenous law, and Aboriginal–Crown relations. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.

Some state governments are developing cultural competency training programs such as the Government of Canada (see https://csps-efpc.gc.ca/Catalogue/courses-eng.aspx?code=K106), but research is needed to understand the effectiveness of existing training programs and how they can be improved. Following Ermine's (2007) ethical space, cultural competency training programs for state government representatives should, in part, orient people towards humility and reflexivity on how the societal call for elevating the status of Indigenous peoples in freshwater governance is being undermined by the continued colonizing effects of existing laws and policies; state government representatives' assumptions and misunderstandings about Indigenous peoples (Ermine, 2007); and policy-making processes that neglect Indigenous peoples' social relationships with freshwater (Anderson et al., 2019).

Enhancing the humility and reflexive capacity of state government representatives could also help diminish the fear that Community Participants contended was motivating the GoA's bounded inclusivity approach to SWQMFLAR development. Government Participants did not express their perspectives in terms of emotions as did many of the Community Participants, and so I was unable to confirm whether Government Participants did indeed feel fearful towards MCFN and ACFN as potential threats to the wealth generated by the oil sands. However, Government Participants did describe how they were protective of that wealth (further described in section 8.2.3), and so fear could very well be their motivator. If reflexivity focused on cross-cultural engagement with Indigenous peoples becomes a norm amongst state government representatives, they, according to Ermine (2007), should become aware of their motivations and

more receptive to egalitarian dialogue with Indigenous peoples. In this case, dialogue can be initiated around the commonalties identified by comparing the Government and Community Participant narratives that are discussed in the next section.

8.2.3 Discussing the Commonalities between Government and Community Participant Narratives

Nineteen commonalities between the Government and Community Participant narratives were identified, signaling that they have a mutual understanding of many of the barriers and drivers to the adoption of ANF by the GoA. In keeping with the centrality of commonalities to the ESF, a fulsome discussion of each commonality is presented in Table 8.1 to reveal recommended measures to advance the ANF in mutually acceptable ways (section 8.3) and suggestions for future research (presented in section 8.4). The discussion of each commonality is presented in table format for two reasons. First, this is a terminology heavy thesis and the table format allows the discussion, description, and IIF categorization of each commonality to be clearly linked. Table 8.1 is an expansion of the commonality tables presented in Chapter 7 (Tables 7.1 and 7.2). Second, the recommended measures presented in section 8.3 serve as a summary of the key information from the commonality discussions, and a summary of the table in this section would be redundant. Overall, my hope is that the table of commonalities can be used by MCFN, ACFN, and federal and provincial governments to initiate specific dialogue on barriers and drivers to the adoption of ANF to foster the active cooperation that Ermine (Different Knowings, 2007) contends is necessary for innovation. Innovation is needed to advance the ANF in ways mutually acceptable to MCFN, ACFN, and the GoA.

Table 8.1: Discussion of the commonalities amongst the barriers and drivers to the adoption of Aboriginal Navigation Flows

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
1	Barrier	Protecting provincial wealth	structural level - resistance	The GoA resisted the imposition of water withdrawal cut-off limits on existing licensees due to their protectionist stance towards the energy and economic security provided by surface mineable oil sands development	Resistance on the part of provincial government to protect the economic and energy security provided by oil sands mining was found to be the most influential barrier shaping the keystone factor, a finding consistent with La Quesne et al.'s (2010) examination of over 20 cases on the adoption and implementation of environmental flows. When competition for freshwater is high or when the economic stakes are great in areas with well-established commercial or industrial enterprises, reorienting state policy towards environmental flows can be difficult (La Quesne et al., 2010; Tan & Jackson, 2013). In Alberta, the importance of aquatic ecosystem protection and preservation is recognized in the province's water laws but is described by Bruno (2014) as not being the basis for water resources management decisions. To Moore (2004) and La Quesne et al. (2010), political will is needed to overcome the resistance created by economic stakes, but political will is an ambiguous concept (Post et al., 2010), that in the context of environmental and cultural flows, would benefit from research to understand its nature and identify strategies for generating and sustaining it.
2	Barrier	Maneuvering rules for legacy projects	structural level - rules	Disagreement about the legal and policy options for establishing water industry-wide withdrawal cut-off thresholds persisted throughout policy-making. The GoA did not perceive the flows in the Lower Athabasca River to be an emergency issue and were concerned about the implications of reducing the senior licensees' water use	Contested legal rules about the circumstances under which water withdrawal cut-off limits could be imposed on senior licensees were a barrier to the adoption of the ANF as proposed by MCFN and ACFN, a finding that aligns with studies on the adoption of environmental flows generally (Harwood et al., 2018) and in Alberta (Bruno, 2014). Uncertainty about the imposition of water withdrawal cut-off limits on senior licensees is considered by some scholars to be a function of the discretionary rather than mandatory provisions that allow water conservation objectives to be established under Alberta's *Water Act* (Bruno, 2014).

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				rights. Conversely, MCFN and ACFN perceived their experiences with river flows as an emergency and argued that the GoA had the legal and policy authority to establish industry-wide water withdrawal cut-off thresholds. Due to the power imbalance between the First Nations and the GoA, the GoA could exercise its discretionary legislated authorities in ways that it chose.	Discretionary legal authorities may provide the flexibility needed to address implications of environmental change such as climate change (Craig et al., 2017) and to creatively redress impacts of a colonial history on Indigenous peoples (Morellato, 2008). However, legislative flexibility needs to be accompanied by context specific legislative design features (e.g., standards requiring mandatory action) to protect against incremental policy and program changes that shape how legislation is implemented (Biber & Eagle, 2016; Craig et al., 2017; Davidson et al., 2018). A research agenda to better understand how environmental flows may be preserved in Alberta's rivers has been recommended already (Bankes, 2012; Wenig et al., 2006), and briefly includes the following topics: • An assessment of the *Water Act*'s potential narrowing of the circumstances for modifying existing licences over the preceding *Water Resources Act* (Wenig et al., 2006) • An assessment of mechanisms within the terms and conditions of existing water licences that may be used to conserve water (Wenig et al., 2006) • An assessment of the applicability of legal tools available under the *Water Act* such as Crown reservations, basin closures, and emergency measures to prioritizing environmental flows (Bruno, 2014) This findings in this study support the need for the above research agenda.
3	Barrier	Halting rights-based discussions	structural level - opening	The political structure was closed to rights-based discussions because the GoA preferred that ongoing questions	The closure of discussions between Indigenous peoples and state governments to rights-related topics has not surfaced in the cultural and environmental flows literatures, but it is an example of a strategy observed in

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				about the extent and nature of and responsibilities toward Indigenous rights be resolved in the courts. Bounded discussions prevented MCFN and ACFN from fully conveying the implications of reduced river navigability on their citizens and the GoA from attributing the same meaning to ANF as did the First Nations. Diverged meanings of ANF caused the GoA to act in ways that did not align with MCFN's and ACFN's recommendations.	the collaborative governance literature. Roth et al. (2017) found that in collaborative governance there "is the tendency of depoliticization of issues by subduing the existing rifts [and] conflicts" (p. 60), such as differing interpretations of rights, in part to make processes timelier. The problem with depoliticization of collaborative spaces is that policy problems can be redefined in ways that reinforce existing power structures (Brisbois & de Loë, 2016; Curran, 2019; Wilson et al., 2019). Problem redefinition was how Community Participants experienced the GoA's refusal to talk about rights because, to them, they were unable to fully convey the seriousness of the water flow problem to federal and provincial governments without talking about their rights. Engaging in ad hoc conversations on the meaning and extent of Indigenous rights during specific environmental flow assessments is likely unproductive, as has been found for project specific environmental assessments (Noble & Udofia, 2015). However, broader, strategic forums are needed in which state governments and Indigenous peoples can engage in discussions to understand underpinning standpoints and concerns about rights (e.g., why some Indigenous peoples find state government assertions that policy processes will not alter their rights disrespectful – see section 5.1.5) to generate context-specific solutions.
4	Barrier	Incongruently relating river navigability, wellness, and surface water quantity management	individual level – intra- and inter-constellational congruence	Relationships among river navigability, human wellness, and surface water quantity management were defined differently amongst Government Participants and between Government and Community Participants. These incongruent definitions led to	This study found that conceptions of wellness and its relationships to river navigability and surface water quantity management were inconsistent amongst Government Participants (intra-constellational incongruence), and that Government Participants' conceptions were different from the Community Participants' conception of wellness and the wellness-river navigability-surface water quantity management relationship (inter-constellational incongruence).

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				the GoA's underappreciation of the sense of urgency with which MCFN and ACFN introduced ANF, justifying to the GoA the inclusion of monitoring provisions rather than water withdrawal rules for river navigability in the SWQMFLAR.	Generally, these findings related to wellness are unsurprising because peoples holding differing worldviews often attach different meanings to wellness (Völker & Kistemann, 2011), which is acknowledged in the environmental flows literature (Anderson et al., 2019). However, the environmental flows literature has not addressed differences in perspectives on wellness and the wellness-river navigability-surface water quantity management relationship amongst federal and provincial government representatives. Intra-constellational incongruence amongst Government Participants suggests that the notions of health and wellness for the Lower Athabasca River region are inconsistently or poorly defined or understood, or if they are well defined and understood, organizational expectations for implementing the concepts in surface water quantity policy are unclear to Government Participants. The challenge with the wellness related inter- and intra-constellational incongruencies is that without a common language in terms of words used and how those words are understood, people are less likely to unite around a common problem definition (Posner & Cvitanovic, 2019) because problem definition is a discursive process influenced by language choices (Kurze & Lenschow, 2016). Since the selection of policy prescriptions is affected by problem definitions, disagreement on the problem will likely lead to disagreement about the appropriateness of the policy prescriptions (Kurze & Lenschow, 2016). Since a common language on wellness was not established during development of the SWQMFLAR or when the ANF were being discussed, the different perspectives on the relationship between wellness, river navigability, and surface water quantity management are understandable.

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
5	Barrier	Building different paths to legitimacy	individual level – inter-constellational congruence in the Community Participant narrative / cultural level - legitimacy in the Government Participant narrative	Differing views on the participation status of MCFN and ACFN translated into different opinions on the legitimacy of the First Nations introducing ANF outside of the collaborative. While MCFN and ACFN regarded the bilateral interactions with the GoA as appropriate given their status as rights-holders, the bilateral interactions partially delegitimized ANF to some Government Participants because the ideas were not subjected to the same collaborative scrutiny as the P2FC recommendations.	This study's finding that Government and Community Participants have incongruent perspectives on whether MCFN and ACFN should be positioned as stakeholders or rights-holders is well-documented in the Canadian freshwater governance literature (Curran, 2019; Phare, 2009; von der Porten & de Loë, 2014) and has been raised by Indigenous peoples in other jurisdictions such as Australia (Hemming et al., 2019). One of the implications of the different perspectives on the position of Indigenous peoples is that Indigenous peoples have to make hard strategic choices to either continue collaborating with state governments or withdraw their participation (Bullock et al., 2020; Weir, 2009). If they choose to continue collaborating, they have an opportunity to share their perspectives, but they risk legitimizing a process they find disrespectful and meaningless. If they choose to not participate in the collaboration, they make their concerns about the process known, but they risk not being heard and being blamed for not taking advantage of opportunities to engage with state governments. This research is an example of the latter situation because, to Government Participants, the ANF were somewhat delegitimized as a policy prescription by MCFN's and ACFN's refusal to participate as members of the P2FC. There is no one "right way" to recognize Indigenous peoples' political interests in freshwater through the design of collaborations (Bullock et al., 2020), but recognizing their political interests in having an authoritative role in freshwater governance within their waterscapes is a vital part of Indigenous peoples' path to self-determination (Hemming et al., 2019; Reo et al., 2017).
6	Barrier	Incongruently addressing incommensurable policy options	individual level - inter-constellational congruence	Due to their concerns about the commensurability of ANF with the modelling approach used in the SWQMFLAR, the GoA	**Note: This discussion addresses rows 6 and 7 in this table.**

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Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				unilaterally modified ANF (e.g., the GoA modified the river flow corresponding to the zero point for river navigability). The GoA's unilateral modifications of ANF were considered unethical by the First Nations because people outside their communities translated their ideas in ways that to MCFN and ACFN rendered the policy ineffectual at meeting their interests. Conversely, the GoA perceived the modifications as necessary to align with their modelling approach to policy development and committed to revising the SWQMFLAR if monitoring data supported a change in the water withdrawal rules.	Two findings related to inter-constellational incongruence, including Western Science being valued more than Traditional Knowledge by some Government Participants and the GoA's unilateral modification of ANF, that emerged from this research corroborate well-known challenges within cross-cultural freshwater governance arenas seeking knowledge pluralism (Mazzocchi, 2018; von der Porten et al., 2016). State governments often demonstrate a reluctance to accept Traditional Knowledge without first corroborating it using western scientific data, a privileging act that often distills, dilutes, or alters the meaning of Traditional Knowledge (Abu, 2017; von der Porten et al., 2016). Despite this ongoing problem associated with "fitting" Traditional Knowledge into state government-led freshwater governance, some Indigenous peoples (Snively & Williams, 2016; von der Porten et al., 2016) and state governments (von der Porten et al., 2016) continue to see value in Traditional Knowledge being used to inform freshwater governance. To meet this ongoing need for Traditional Knowledge, some
7	Barrier	Incongruently prioritizing different knowledges	individual level - inter-constellational congruence	The GoA trusted the quantitative scientific conclusions that oil sands water withdrawals were insignificantly impacting river flows while MCFN and ACFN trusted their experiential-based Traditional Knowledge that stated river flows were being impacted. The different valuations of the knowledge systems resulted in the GoA perceiving river navigability as a less urgent issue than did MCFN and ACFN.	researchers are attempting to define and characterize Traditional Knowledge, assuming that understanding Traditional Knowledge will reveal interventions facilitating its use in natural resource management (Bohensky & Maru, 2011; Tsuji & Ho, 2002). An unintended outcome of characterizing Traditional Knowledge is emphasis of the differences between Western Science and Traditional Knowledge systems leading to paralysis around its use: "It is often very difficult to accept a different system of knowledge when one is constantly being reminded about how different it is from one's own" (Tsuji & Ho, 2002, p. 329). To overcome this paralysis, some researchers have begun emphasizing similarities between Traditional Knowledge and Western Science (Tsuji & Ho, 2002; Weir, 2016) while others are seeking

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				Consequently, the GoA addressed river navigability within the monitoring provisions rather than in the water withdrawal rules contained with the SWQMFLAR.	different models of using Traditional Knowledge together (Abu, 2017), such as "braiding" knowledges (Snively & Williams, 2016). Other researchers claim that a more fundamental shift is needed because of power imbalances between Indigenous peoples and state governments, suggesting that freshwater governance should be centered around Indigenous peoples' self-determination. Centering freshwater governance on Indigenous self-determination can consist of approaching freshwater governance as legally and ontologically pluralistic systems (Wilson & Inkster, 2018) and supporting Indigenous peoples in their use of their knowledges to make their own decisions about their waterscapes (von der Porten et al., 2016). For each of the approaches to overcoming the privileging of Western Science over Traditional Knowledge, there are opportunities for further exploration into how and under what circumstances they contribute to the decolonization of freshwater governance. The ANF can be considered an example of where Indigenous peoples were supported in their efforts to use their own knowledge, suggesting that cultural flows can be a decolonizing tool for environmental flow assessments. As contended in section 8.1.1, for cultural flows to be decolonizing, they need to be treated as indivisible translations from which components cannot be extracted for use in environmental flow assessments unless considered appropriate by the Indigenous peoples who undertook the cultural flow assessment. In this case, the GoA modified the ANF in part because they needed a "zero point" corresponding to when river navigability was considered impossible so that impacts to Indigenous river navigability from incremental changes in water withdrawal rates could be measured. To some Community Participants, zero meant death and should therefore be avoided. While this is a specific

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
					difference underpinning Traditional Knowledge and Western Science from *one* setting, understanding how zero is perceived may help address misunderstandings leading to state government resistance to the use of cultural flows within environmental flow assessments to meet Indigenous peoples' interests.
8	Barrier	Narrowing the geographic problem scope	cultural level - framing	Over time, the geographic scope of the surface water quantity problem addressed by the different phases of water policy development was narrowed to only the Lower Athabasca River mainstem, excluding the tributaries and the Peace Athabasca Delta. The narrowed geographic scope reduced the biophysical complexity of the policy problem, enabling timelier completion of the SWQMFLAR but also masking the full range of the socio-cultural impacts of oil sands water withdrawals on MCFN and ACFN. The hidden impacts prevented the GoA from understanding the urgency underpinning the First Nations' promotion of ANF, which contributed to the GoA's translation rather than direct use of ANF.	This study found that the geographic scope of the SWQMFLAR was narrowed over time, reducing the biophysical complexity of determining the instream flow needs so that the policy process could be timelier but also masking the range of the socio-cultural impacts of the oil sands as perceived by Community Participants. This finding on geographic scope aligns with current knowledge of environmental flow assessments: time is often a restricting factor for environmental flow assessments because the information needed to quantify eco-hydrological and social, cultural, and economic processes is extensive and complex (Tegos et al., 2018); and the selection of the geographic scope of an environmental flow assessment matters because drivers of eco-hydrological and socio-economic processes within an area occur at different scales (Williams et al., 2019). Although not a new finding, the reminder that the geographic scope matters for social, cultural, and economic processes that comes from this research is helpful because of potential implications of defining spatial boundaries for environmental governance. First, (re)scaling of spatial boundaries may result in shifted power structures and resource use priorities that can exacerbate rather than remedy problems (Cohen & Bakker, 2014). In this case, the SWQMFLAR was promoted by the GoA as a policy that safeguarded the downstream basin even though its geographic scope excluded much of the home territories of MCFN and ACFN, leaving Community Participants with questions about when and how their

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
					river navigability interests would be protected. Second, the wellness of local people in a basin may be compromised when the reorganization of waterscapes for environmental governance neglects how the local people organize and use their waterscapes (Lokgariwar et al., 2014; Weir, 2016). In this case, Community Participants described how the family-based organization of their waterscape was being eroded by low flows that to them are exacerbated by surface mineable oil sands water withdrawals which to them was not understood by the GoA. Due to the importance of geographic scope for understanding and addressing social, cultural, and economic processes, environmental flow assessments should begin by seeking to understand the spatial boundaries that are meaningful to all participants (Lokgariwar et al., 2014) to facilitate achieving agreed-upon goals (Warner et al., 2008; Cohen, 2015).
9	Barrier	Regulating by blame apportionment	cultural level - framing	The GoA was mandated to develop policy that regulated consumptive water uses to help prevent degradation of the aquatic ecosystems of the Lower Athabasca River. Community Participants described this regulatory approach as "blame" focussed that is prohibitive to achieving the First Nations' interests because it prevented the GoA from imposing water withdrawal cut-off limits on senior and existing licensees until there was proof that industrial water withdrawals, rather than climate change or	This study found disagreement between Government and Community Participants' preferred framings for industrial water use regulation, a finding that is unsurprising because their respective framings reflect the well-documented worldviews of state governments and Indigenous peoples in Canada. Community Participants preferred a communal problem-solving approach to regulation that required all entities reliant upon the Lower Athabasca River to take actions necessary to restore and sustain Lower Athabasca River flows, regardless of what (e.g., climate change) or who (e.g., a specific water user) was the cause of the change in the river's health. The communal approach to regulation is an extension of "Indigenous worldviews [that] highlight a strong focus on people and entities coming together to help and support one another in their relationship" (Hart, 2010, p. 3). In short, all peoples who depend on the Lower Athabasca River should

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				another factor, were the cause of changing river flows. Community Participants asserted that the GoA should regulate industrial water withdrawals to restore flows in the Lower Athabasca River regardless of the cause of the problem. The GoA recognized MCFN's and ACFN's perspectives but asserted that they were limited in what could be done under Alberta's *Water Act*. Hence, monitoring for the impact of climate change on river flows were incorporated into the SWQMFLAR's adaptive management program.	cooperatively protect the river for the benefit of all people, the river, and all non-human entities. Conversely, Government Participants described the need to regulate industrial water usage based on that usage's impact to freshwater resources within the context of environmental change and societal freshwater resource needs in the future. This utilitarian-stewardship approach to freshwater resources regulation is common globally (Watson et al., 2019) and unlikely to fundamentally change soon. Consequently, there is a clear need for adaptive management tools to be included in legal frameworks (e.g., authorities to alter water rights) that allow state governments to be responsive to environmental and social changes over time (Biber & Eagle, 2016; Craig et al., 2017). Research that can inform the design of adaptive management legal tools such that they provide both flexibility to respond to change and certainty in their use when change is experienced is needed (Biber & Eagle, 2016; Craig et al., 2017). Through such research, communal and utilitarian-stewardship approaches to water use regulation may be brought closer together through increased responsiveness to change within legal frameworks.
10	Barrier	Being hindered by a narrow regulatory framework for navigation	structural level - rules	The legal framework within which federal and provincial governments could act upon ANF was limited at the federal level because the impacts of industrial water withdrawals on river navigability were outside the scope of the *Navigation Protection Act* in force in 2010. Consequently, MCFN and ACFN were constrained in the avenues they could use to	In this study, a legal framework that did not regulate water withdrawals as a potential impact to river navigability constrained the avenues through which MCFN and ACFN could have their river navigability concerns addressed. To my knowledge, research into legal frameworks for river navigability within the cultural and environmental flows literature has not been done, but the "existence of conducive legislation" is critical to the adoption and implementation of environmental flows more broadly (Harwood et al., 2018, n.p.; also la Quesne et al., 2010; Moore, 2004). The finding here suggests that conducive legislation, in

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				address their river navigability concerns.	part, means a legislative framework that protects the specific interest and regulates the causes of impacts to the specific interest. Interestingly, in 2019, the federal legislation for navigation, now titled the *Canadian Navigable Waters Act*, was amended, and those amendments include a definition for navigable water encompassing freshwater used for transport and travel by Indigenous peoples exercising rights recognized and affirmed by section 35 of the *Constitution Act, 1982* (specific interest) and expanded prohibitions on dewatering navigable waters (regulation of the cause of impacts to specific interests). Since the amendments were introduced after the SWQMFLAR was released, an analysis of the amendments to the *Canadian Navigable Waters Act* in protecting river navigability for Indigenous uses could inform future amendments to the Canadian Navigable Waters Act and, more broadly, legislative design in support of environmental flows that address a broad range of interests.
11	Driver	Collective communicating to be heard	structural level - communications	Persistent, consistent, and joint communications by MCFN and ACFN, with assistance from allied western scientists, kept the First Nations' river navigability interests at the forefront of discussions during the final phase of policy development so that government representatives had to act on ANF.	This study found that MCFN's and ACFN's consistent and persistent communications carried out jointly were the most influential driver to the adoption of ANF, a finding that aligns with known conditions that enhance the role of Indigenous peoples in freshwater governance. Indigenous participation in freshwater governance is leveraged by self-organized Indigenous agencies that clearly articulate their visions for their waterscapes and foster clear lines of communications with state governments (Cosens & Chaffin, 2016; Weir, 2016). Alliances between Indigenous peoples and non-Indigenous allies are also important to strengthening their voices in state government-led freshwater governance arenas (Jackson, 2019), which in this case was perceived by many Community and Government Participants as the most vital aspect of MCFN's and ACFN's communications. Joint or collective lobbying

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
					is an important influence in environmental policy making processes, especially during the early stages of the processes (Nelson & Yackee, 2012), and when there is a high degree of consensus amongst the members of an advocacy group on issue framing and message delivery (Junk & Rasmussen, 2018; Nelson & Yackee, 2012). Through their consensus on the importance of river navigability and appropriate policy prescriptions and their collective advocacy, MCFN and ACFN are effecting change such that their river navigability interests are being taken seriously by federal and provincial governments.
12	Driver	Strengthening legal protections for rights	structural level - rules	Evolving rules, including constitutional law, common law, and policy requirements, created space for MCFN and ACFN to share their perspectives on surface water quantity management for the Lower Athabasca River. These rules created that space because they required the GoA to (i) recognize MCFN's and ACFN's rights as treaty signatories; and (ii) meet consultation obligations.	**Note: This discussion addresses rows items 12 and 13.** Corroborating recent studies on cases from the United States and Australia (see Cosens & Chaffin, 2016), this research found that the combination of legal recognition of Indigenous rights and Crown consultation responsibilities and policy encouraging inclusive freshwater governance created space for MCFN and ACFN to participate in the environmental flow assessment for the Lower Athabasca River. Legal and policy frameworks for Indigenous rights and consultation vary between jurisdictions but the recognition of formerly marginalized rights can destabilize centralized water management, prompting locally-base initiatives that can engage marginalized rights-holders (Cosens & Chaffin, 2016). However, rights recognition does not necessarily prompt an immediate willingness on the part of state governments to engage with marginalized rights holders. For example, in Australia it took over a decade after that country's High Court recognized and protected native title before Indigenous participation and interests were placed on the national policy agenda for freshwater
13	Driver	Leveraging extant openings	structural level - opening	The shared stewardship model adopted by the GoA for water resources opened surface water quantity policy-making to diverse interest holders. MCFN and ACFN took advantage of the participation opportunities by becoming involved in CEMA and developing and promoting ANF so that their	

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				river uses could be accommodated in the policy.	governance (Tan & Jackson, 2013). Even after becoming a policy priority, active implementation of the policies to enhance the place of Indigenous peoples and their interests in freshwater governance only occurred after a few years (National Water Commission, 2009; Tan & Jackson, 2013). Additionally, active implementation of participatory policies is not equivalent to respectful implementation as demonstrated by the withdrawal of MCFN and ACFN, along with other Indigenous peoples, from CEMA in protest of what they perceived as its unfair governance structure. Clearly, legal and policy frameworks provide an impetus for involving Indigenous peoples in freshwater governance, but they are insufficient on their own to sustain respectful engagement of Indigenous peoples so that their freshwater interests can be met.
14	Driver	Seeking a progressive reputation	cultural level - legitimacy	To help secure the marketability of oil sands products, the GoA sought to legitimize its regulation of oil sands mining partly by promoting the SWQMFLAR as an inclusively developed water quantity policy that facilitated ongoing performance of Indigenous river uses and protected the river's health. The GoA did invest time and staffing resources to evaluate ANF, creating an opportunity for the First Nations to share and clarify their interests. However, Community Participants asserted that the GoA's efforts were insincere, and therefore not legitimate,	This study highlighted how seeking legitimacy through collaborative policy-making may benefit state governments but reinforce the status quo marginalization of Indigenous peoples' interests (Schmidt, 2014). The GoA established collaborative freshwater policy-making to, in part, enhance the legitimacy of its regulation of oil sands mining water withdrawals, a move that is unsurprising given the well-documented political controversies surrounding the environmental and social costs of oil sands mining (see Turner, 2017) and the increasingly entrenched international norm of decentralized governance accommodating diverse perspectives (Schmidt, 2014; Jackson, 2019). However, to Community Participants in this research, the GoA's claims of inclusivity were insincere because, to them, their river navigability interests were not protected by the SWQMFLAR. In other words, to Community Participants, the collaborative policy-making should have treated their

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
				because MCFN's and ACFN's interests were only superficially met.	interests fairly and therefore the products coming from that collaboration were illegitimate, which is an example of potential effects of power imbalances in decentralized governance collaboratives previously explored by Jackson (2019) and Schmidt (2014). Jackson (2019) and Schmidt (2014) challenge the underpinning assumption that procedures within decentralized governance do not favour the interests of any one group by demonstrating how those in political power, by establishing the conditions of participation, marginalize those who do not conform. MCFN and ACFN were nonconforming because they continued to push for an industry-wide water withdrawal cut-off threshold that was unsupported by the GoA; hence, the ANF were not adopted as the First Nations proposed. In sum, state governments seeking legitimacy within the broader political context in which they function should also seek legitimacy at the regional level, which within cross-cultural contexts, entails, in part, the elevation of Indigenous self-determination and modes of governance (Jackson, 2019).
15	Driver	Resituating socio-cultural goals	cultural level - framing	Space for Indigenous river uses in policy development was created when the relationship between social, cultural, environmental, and economic goals was reframed by the GoA in response to the First Nations' advocacy efforts. The GoA's reframing caused the scope of policy-making to expand because social and cultural goals were recognized as being intimately related to but separate from economic and environmental goals.	This study found that as the GoA's reframing of social and cultural goals as separate from but related to economic or environmental goals made the GoA more receptive to the ANF, a finding that follows the well-documented trajectory of the evolution of environmental flow science globally (see Anderson et al., 2019 and Jackson, 2017 for concise histories of environmental flow science). Initially focussed on eco-hydrological objectives, frameworks for environmental flow assessments are continually expanding, now seeking to protect rivers as socio-ecological systems (Pahl-Wostl et al 2013) that incorporate peoples' diverse relationships with rivers (Anderson et al., 2019). As part of this expansion of environmental flow assessments, there is growing recognition that

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Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
					Indigenous peoples' interests may differ from state governments' interests that typically focus on ecological protections (Finn & Jackson, 2011), an observation this study confirmed when Indigenous peoples involved in CEMA, including MCFN and ACFN, advocated to have river navigability included as an interest alongside the fisheries protections constituting the instream flow needs work for the Lower Athabasca River. The reframing of social and cultural goals demonstrates that social learning in cross-cultural contexts is possible and an important area for research that will support inclusion of Indigenous-river relations in environmental flow assessments.
16	Driver	Accepting policy-making as an inclusive, values laden endeavour based on knowledge	Individual level - intra- and inter-constellational congruence	Community and Government Participants agreed that policy-making is a subjective endeavour supported by information to integrate the social, cultural, environmental, and economic interests held by diverse peoples. Perceiving policy-making as subjective and inclusive created the openness necessary to address the GoA's, MCFN's, and ACFN's socio-cultural goals related to community wellness.	Community and Government Participants were shown to have congruent perspectives on policy-making as a subjective endeavor integrating a range of social, cultural, environmental, and economic interests held by diverse peoples, a finding that differs from claims that non-Indigenous interests in freshwater are often perceived as objective. Jackson (2017) raised a concern that when cultural flows are pursued as separate quanta of water from environmental flows, non-Indigenous state government representatives (among other non-Indigenous people involved in freshwater governance) may perceive their freshwater interests as objective, unbiased, and politically inconsequential and the interests of Indigenous peoples as values-based and politically consequential. Due to the perception that their interests are objective and politically inconsequential, state goverment representatives may consider their interests "more meritorious" than those conveyed through cultural flows (Jackson, 2017, n.p.). In this case where cultural flows informed an environmental flow assessment that under legislation could address non-ecological interests such as recreation, Government Participants embraced

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
					environmental flow assessment as a social process consisting of subjective choices supported by facts. Comparing the contexts of these two preceding situations, it appears that there are two potential factors that shape whether and what interests are perceived as subjective by non-Indigenous state government representatives: (i) the relationship between cultural flows and environmental flows (that is, whether environmental flows are distinct from or informed by cultural flows); and (ii) whether the inclusion of non eco-hydrological objectives are supported in legislation and part of the early design of environmental flow assessments. Another possible explanation for Government Participants' perception that interests are values-based is training. During Phase 2 of the policy-making process, professional facilitators used a structured decision-making process that in part consisted of training participants to accept that facts and values are important inputs into setting objectives, trade-off evaluations, and choices leading to the development of surface water quantity policy (see Gregory et al., 2012, p. 28). In sum, training, the relationship between cultural flows and environmental flows, and whether the inclusion of non-eco-hydrological objectives in environmental flows are supported in legislation are three contextual factors that have the potential to shape whether and what interests are perceived as subjective or objective. Research providing insight into the preconditions that shape how Indigenous interests are perceived by non-Indigenous participants in environmental flow assessments and how those perceptions shape interest prioritization could enhance the receptiveness of environmental flow assessments to a range of interests in different contexts.
17	Driver	Building momentum	individual level - norms & harmony in the	Creativity was considered essential for capturing	Creativity was found in this study to be an important norm that enhanced engagement between Indigenous

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
		through creativity	Community Participant narrative / structural level - incentives in the Government Participant narrative	Indigenous interests in policy-making by the Government and Community Participants, although Community Participants disagreed that the GoA demonstrated this characteristic. First Nations used their creativity to find ways to increase the effectiveness of their participation in natural resource management, including the mobilization of their Traditional Knowledge to develop ANF. GoA representatives employed creativity to find ways to use ANF in policy-making and this provided them with a sense of satisfaction and accomplishment that fueled further creativity in a positive feedback loop.	peoples and state governments and accommodation of Indigenous interests in policy-making, a finding that has been alluded to but not explicitly identified as a precondition driving the adoption of environmental or cultural flows. The need for creative solutions is frequently mentioned by people engaged in cultural and environmental flow sciences. For example, creative solutions are needed to implement environmental flows in basins where there are well-established operating and regulatory arrangements (Docker & Johnson, 2017) and in finding compromises between ecological and engineering objectives in the siting, design, operation, and decommissioning of dam infrastructure (Thomas, 2017). Indigenous peoples also employ creativity to develop strategies (e.g., formation of Indigenous governance bodies; guardian programs; agreement-making) that provide them with an authoritative role in freshwater governance (Hemming et al., 2019). However, in studies that identify enabling factors for the adoption and implementation of cultural and environmental flows, creativity does not appear as an enabling factor and fostering creativity is not a recommended action. The findings of this study point to the need to acknowledge creativity as an enabling condition because it was vital to Community Participants to leverage their own knowledge to advance their interests and to Government Participants' efforts to find a way to use the ANF in the SWQMFLAR. Specifically, Government Participants in this study described how employing creativity provided them with a sense of satisfaction and accomplishment that enabled them to persevere in their efforts to use the ANF in policy-making. The claim that creativity should be repositioned as an enabling condition that needs to be fostered in organizations pursuing cultural and environmental flows is supported by Merrey and Cook's (2012) use of creativity to solve complex

Line No.	Barrier or Driver	Commonality Label	Implementing Innovation Framework Classification	Commonality Description	Discussion of Commonality
					problems at the nexus of water, food, and poverty in river basins.
18	Driver	Incentivising participation through resource sharing	structural level - incentives	Resource sharing (information and funding) facilitated Indigenous participation in surface water quantity policy-making, although Community and Government Participants agreed that this was not a key facilitator.	This study reconfirms funding as a factor incentivizing Indigenous peoples' engagement within environmental governance arenas (Ellis, 2005; Udofia et al., 2017) and information availability, including Traditional Knowledge, as a factor enabling environmental flows adoption (Arthington et al., 2018). Funding is needed to collect biophysical and socio-economic information necessary to assess environmental flow needs (Harwood et al., 2018), but the reason why Government and Community Participants agreed funding is not a key factor is unclear. MCFN's and ACFN's preparation of the *As Long as the Rivers Flow Report* was funded, perhaps freeing Government and Community Participants to focus instead on the quality of information provided by MCFN and ACFN. Government and Community Participants agreed that MCFN's and ACFN's submissions on river navigability were helpful and thorough. Regardless of the reason why funding was less of a concern in this study, funding and information availability were still shown to be important to state governments and Indigenous peoples in their pursuit of environmental and cultural flows.
19	Driver	Acting on common water worries	cultural level - shocks	Low water levels in the Lower Athabasca River raised concerns amongst Indigenous peoples, government, and industry, prompting them to initiate surface water quantity policy-making to prevent degradation of the aquatic ecosystem.	Government and Community Participants alike were catalyzed by low river flows, a common catalyst for actions to protect aquatic ecosystems around the world (Poff & Matthews, 2013).

8.3 Recommended Measures

Below are eight recommended measures that weave together insights gained from the discussions on the significance of the ANF to the Indigenous peoples of the Peace Athabasca Delta, the keystone factor influencing the adoption of the ANF, and the commonalities and patterns in the commonalities that interacted to shape the keystone factor. My hope is that, collectively, the recommended measures will provide actionable ideas on how the institutional arrangements currently shaping the GoA's bounded inclusivity approach to policy-making may be realigned such that the ANF can be advanced in ways that are mutually acceptable to federal and provincial governments, MCFN, and ACFN. To Ermine, this shift towards mutuality is creating ethical space.

In preparing the recommended measures, I acknowledge that, to Government and Community Participants, the legal framework for Indigenous rights (substantive and procedural) flowing from their respective legal systems created openings for their collaboration but, due to differently interpreted Aboriginal and treaty rights, also created divides in their relationship. Indigenous rights recognition and legal pluralism are deserving of their own dedicated research, and thus are too broad to address in this thesis. Further, the insights shared here come from one cultural flows case and should not be perceived as a prescription for the adoption of cultural flows. Instead, the recommended measures are a starting point and will likely need to be adapted, expanded, or refined to suit different needs and circumstances and the findings from suggestions for future research in section 8.4.

1. Leveraging cultural shifts at the societal level, Indigenous self-determination needs to be centrally positioned within river flow governance arenas, which can be achieved by the following actions:
    i. Funding for Indigenous peoples to carry out their own cultural flow assessments should be secured during the early stages of environmental flow assessments. Early funding is needed to allow sufficient time for Indigenous peoples to fully explore their interests and include them as objectives in the environmental flow assessment. Independency is critical because Indigenous peoples will then be able to design the cultural flow

assessment such that they receive desired benefits (e.g., strengthening of their internal knowledge sharing systems) from participating in the assessments.

ii. Cultural flow assessment reports should be treated as indivisible translations from which components cannot be extracted or modified unless considered appropriate by the Indigenous peoples who undertook the cultural flow assessment.

iii. (Perceived) dissonance between scientific approaches used in an environmental flow assessment and a cultural flow assessment report should be discussed with the Indigenous peoples to encourage learning and to collaboratively identify solutions.

iv. Environmental flow assessment should accommodate as needed Indigenous peoples' obligations to care for peoples of other cultures (including other Indigenous cultures) or state governments through their Indigenous legal systems, treaties, or other agreements. Cultural flow assessments may be a means through which Indigenous peoples can fulfill their obligation to other peoples and state governments.

v. Indigenous peoples' ways of life may include vital capabilities (e.g., boating) that need to be accommodated in environmental flow assessments as more than recreation.

2. To strengthen their voices in freshwater governance characterized by power imbalances, Indigenous peoples, on their own terms, should seek opportunities to form alliances. When Indigenous peoples form alliances, they need to be recognized as distinct, self-determining nations with different histories, laws, practices, customs, and beliefs.

3. Enact and enforce legislative frameworks, with instructional policies, that support adoption of cultural flows into environmental flow assessments. Specifically, legal frameworks need to protect environmental flows for ecological, social, cultural,

recreational, spiritual, relational[58], and economic objectives to accommodate Indigenous peoples' potentially different interests; prescribe a collaborative approach for environmental flow assessments; and provide instruction for determining what constitutes an environmental emergency and other conditions under which existing water rights may be reduced.

4. When wellness is invoked as a broad objective for environmental flows, early collaborative dialogue between participants in an environmental flow assessment is needed to understand the different meanings that participants may attach to wellness and identify different or alternative objectives associated with the wellness meanings. Dialogue about wellness should assume that organizations from different and the same sectors could attach different meanings to wellness.

5. Cultural flow assessments should be completed through a lens of self-determined change adaptation based the Indigenous peoples' vision for their community and waterscape, where deemed needed by Indigenous peoples who have a relationship with the waterscape. The application of the lens of self-determined change adaptation should be broad, allowing for the social, cultural, economic, and governance institutions and hard infrastructure needed to meet the Indigenous peoples' vision.

6. The spatial boundaries of environmental flow assessments need to be negotiated early in the environmental assessment process, encompassing eco-hydrological (e.g., watersheds) and social (e.g., family territories of an Indigenous people) organizations of the waterscape. If resource or other constraints necessitate the exclusion of some areas, the excluded areas should be negotiated, and where possible, measures should be taken in the environmental flow assessment (e.g., more stringent criteria as part of a precautionary approach) or through different environmental planning and management initiatives to address negotiated political, social, ecological, cultural, and economic objectives for the excluded areas.

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[58] Relational objectives refer to objectives designed to protect diverse human-river relationships and is grounded in the call for ontological multiplicity described in section 8.1.1.

7. Organizations involved in environmental flows science need to foster a cultural of creativity, encouraging the open generation and testing of novel ideas and approaches that challenge the status quo to effect context-specific, mutually-supported change.

8. Cultural competency training programs for state government representatives need to be developed that increase their capacity in establishing freshwater governance as ethical space. The training programs should align with the Truth and Reconciliation Commission Call to Action #57 and be guided by Ermine's ethical space, emphasizing development of two skills. The first skill is reflexivity on how the marginalization of Indigenous peoples in freshwater governance is being continued colonizing effects of existing laws and policies, state government representatives' assumptions and biases about Indigenous peoples, and culturally inappropriate policy-making processes that neglect Indigenous peoples' social relationships with freshwater. The second skill is respectful interrogation of ideas and perspectives in cross-cultural engagement spaces with the goal of finding common ground. Together, the skills of reflexivity and respectful interrogation should, as contended by Ermine (2007), foster the conditions necessary for innovation on matters such as freshwater that are mutually important to state governments and Indigenous peoples.

8.4 Suggestions for Future Research

Section 8.4 synthesizes the suggestions made for future research made throughout sections 8.1 and 8.2 and provides additional suggestions.

1. Political will is needed to overcome the resistance that is hindering more equitable power sharing between state governments and Indigenous peoples, but political will is an ambiguous and imprecise concept. Research into the nature of political will as it intersects with power sharing and strategies to generate and direct it to produce institutional change is needed.

2. The research agenda developed by Bankes (2012), Bruno (2014), and Wenig et al. (2006) to understand how environmental flows may be protected under Alberta's *Water Act* should be implemented, including the following:

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- An assessment of the *Water Act*'s potential narrowing of the circumstances for modifying existing licences over the preceding *Water Resources Act*
- An assessment of mechanisms within the terms and conditions of existing water licences that may be used to conserve water
- An assessment of the applicability of legal tools available under the *Water Act* such as Crown reservations, basin closures, and emergency measures to prioritizing environmental flows

Specifically, the above research agenda should seek to understand the legal and policy mechanisms for applying a water withdrawal cut-off threshold for senior licensees and the policy implications for making the establishment of water conservation objectives under mandatory.

3. Research into legislative and policy tools that support the adaptive management of environmental flows by providing the flexibility needed to respond to environmental and social change but also certainty in how and under what conditions the tools will be implemented.

4. This research showed how collaboration between Indigenous peoples can be effective in advancing their interests in surface water quantity policy. Research that deepens knowledge of the formation of Indigenous alliances and how, why, when, and where they are effective from the perspectives of Indigenous peoples and state governments may provide insights that other Indigenous peoples can adapt for their purposes as they work towards securing their interests through cultural flows. State governments seeking to enter into agreements with Indigenous peoples could also use the insights to ensure their actions are connective rather than divisive. Any research into Indigenous collaboratives must not exacerbate the historical homogenization of Indigenous peoples by governments within colonial states; the self-determined, cultural distinctiveness of Indigenous peoples as embodied in their different histories, laws, practices, customs, and beliefs would need to be recognized.

5. Research into how organizations involved in environmental flow and cultural flow science may foster creativity that encourages the open generation and testing of novel ideas and approaches that challenge the status quo to effect context-specific culturally-appropriate change.

6. Given that "climate change and social effects of this global phenomenon are one of the main problems of the 21st century" (Filippova, 2020, n.p.) and that adapting to change in self-determined ways is a component of some Indigenous peoples' collective wellness, research into how self-determined change adaptation may be applied as a lens during cultural flow assessments is needed.

7. To help build state government capacity in establishing freshwater governance as ethical space, research into the efficacy of existing cultural competency training programs that are delivered to public servants and how they may be improved is needed. Goals of the research should be to meet the needs of Truth and Reconciliation Commission Call to Action #57 and understand how to orient public servants towards humility, reflexivity, and respectful interrogation of diverse perspectives in cross-cultural engagement spaces. Specific topics around which to build skills of reflexivity and respectful interrogation include how the marginalization of Indigenous peoples in freshwater governance is being continued by the colonizing effects of existing laws and policies, state government representatives' assumptions and biases about Indigenous peoples, and culturally inappropriate policy-making processes that neglect Indigenous peoples' social relationships with freshwater.

8. Research that applies the IIF to other examples of the adoption, implementation, and appraisal of quantified cultural flows in diverse contexts with the goal of conducting meta-analyses to identify wider patterns in individual, structural, and cultural institutional influences across the policy cycle for cultural flows.

8.5 Research Evaluation

Charmaz (2014) emphasizes that the value of a grounded theory study can be evaluated based on four criteria, including credibility, originality, resonance, and usefulness. Corbin, one of the key researchers engaged in advancing grounded theory methodologies (Patton, 2015), stated that "of all the criteria I've read, I find hers [Charmaz's] the most comprehensive because they address both the scientific and creative aspects of doing qualitative research" (Corbin & Strauss, 2008, p. 299). Following that endorsement, Charmaz's (2014) four criteria for evaluating research are applied here, acknowledging that ultimately the reader evaluates whether the research is credible, original, resonant, and useful (Ferguson, 2019).

3.4.1 Credibility

Credibility refers to the plausibility and authenticity of the research findings and depends on the "research achieving an intimate familiarity with the setting and topic" and "strong logical links between the gathered data and [the] argument and analysis" (Charmaz, 2014, p. 337). To gain an intimate familiarity with the setting (Lower Athabasca River region) and the citizens of MCFN, ACFN, and FCM, I spent over 13 weeks in Fort Chipewyan visiting people at their cabins, going boating and hunting with Indigenous river users, joining the morning "coffee club" at the local diner, participating in community gatherings such as fiddling demonstrations, and volunteering at a dogsled race. Although no community can be fully known in 13 weeks, I came to know many of the research participants outside of direct research activities (e.g., interviews) and developed a sense for at least some relationships between peoples, way of life for people in make their home in and around Fort Chipewyan, and the nature of the waterscape. Spending time in Fort Chipewyan experiencing some parts of daily life helped foster the trust and rapport necessary for Community Participants to comfortably share their perspectives fully and authentically with me and increased my closeness to the data, both of which are needed to establish credibility in constructivist grounded theory studies (Ford, 2010; Charmaz, 2014).

Becoming familiar with the topic of ANF adoption consisted of activities to gather background and contextual information and formal research activities. Contextual information came from reading about CEMA, the P2FC, surface mineable oil sands mining, Treaty No. 8 reports, freshwater management practices in Alberta, ethnohistorical information about Fort Chipewyan, and biophysical information about the Peace Athabasca Delta and Athabasca River. Collectively, the contextual information provided me with an understanding of the geographical, historical, industrial, and biophysical characteristics of the setting, that is, I started to understand the Lower Athabasca River as a socio-ecological system. More focused background information came from informal meetings with provincial government representatives who were not research participants to clarify contents of the SWQMFLAR (e.g., freshwater allocations in the river basin, ANI calculations) and the SWQMFLAR's relationship to the Lower Athabasca Regional Plan and whether the Lower Athabasca Regional Plan was legally binding. The background information helped identify lines of inquiry for the interviews and clarify information provided by Government Participants. Formal research activities that sought data from two sources,

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including documents and interviews, provided a means to triangulate information provided by research participants. Supporting activities such as field note taking, listening and re-listening to recorded interviews, transcribing recordings, memo writing, and diagramming were important for me to get close to the data. Government and Community Participants were also generous with their time, with most participants talking with me for more than three hours. The time invested by research participants helped ensure that I had a full understanding of the information needed to answer the research questions. Gaining an understanding of the context and background information combined with intensive interaction with data collected through two sources enabled a deep understanding of the institutional context through which the ANF were adopted.

The claims made in this thesis were shown to be grounded in the data, an important feature of constructivist grounded theory studies (Charmaz, 2014; Ferguson, 2019; Ford, 2010). Specific information provided in this work was attributed to research participants through pseudonyms and tied to data directly using quotes. Figures were an attempt to convey the meaning of concepts and the linkages between concepts in an understandable format. Together, the attributions, quotes, and figures were intended to provide the evidence needed for an independent assessment of the claims.

3.4.2 Originality

Originality refers to the social and theoretical significance of the research (Charmaz, 2014; Ford, 2010). To Charmaz (2014), research is original if the analysis provides a new conceptual rendering of the data, or existing concepts and practices are challenged, extended, or refined. Theoretically, this research makes three type of contributions. First, the research adds two new concepts, *buoying wellness through superior river navigability* and *running wellness around through poor river navigability*, to the cultural flows and Indigenous wellness literatures. These two concepts reveal that boating can be a vital capability through which Indigenous peoples achieve wellness, which represents a new framing from its more typical conception as a recreational activity. Second, the ANF demonstrated that cultural flows can be a means through which Indigenous peoples can enhance their adaptive capacity and fulfill their responsibilities towards non-Aboriginal peoples stemming from a treaty relationship, two purposes of cultural flows not previously explored. Third, this research demonstrated how the IIF can be applied to

understand cross-cultural innovation adoption in addition to innovation implementation with four modifications (see section 6.0). Empirically demonstrating the usefulness of the framework to innovation adoption and implementation within an Indigenous-colonial state provides an opportunity to directly compare findings across policy process phases, facilitating the development of a multi-phase cross-cultural strategy to advancing cultural flows in freshwater policy.

This social significance of this research relates to highlighting actions that Indigenous peoples and state governments can take to increase their capacity to navigate cross-cultural freshwater governance arenas. First, this research underscored the need raised by Hemming et al. (2019) that the strategies grounded in self-governance used by Indigenous peoples to shape cross-cultural freshwater governance need greater recognition in the mainstream freshwater governance literature. This research extends Hemming et al.'s claims through the finding that Indigenous peoples who collaborate and present a united front on their own terms to state governments may acquire additional power. Second, this research emphasizes the need for state government representatives to increase their capacity to engage with Indigenous peoples in freshwater governance. The need for capacity-building is more commonly made about Indigenous peoples, but state governments would benefit from cultural competency training as well so that they are better equipped to engage respectfully with Indigenous peoples, their interests, and their knowledge systems in freshwater governance arenas. As Indigenous peoples are increasingly empowered and state governments increase their capacity to engage in cross-cultural freshwater governance arenas, opportunities for innovation and reconciliation open (Ermine, 2007).

3.4.3 Resonance

Charmaz (2014) defines resonance as findings that fully capture and make sense to the people experiencing the phenomenon or conditions being researched. To ensure that the findings resonated with research participants, I provided them with opportunities to provide feedback to me on the preliminary findings after reviewing written materials or having me present the materials to them orally using posters of the findings (their choice). Indigenous Community Participants requested that preliminary findings be presented to them visually using posters so that we could mark up the posters with any changes together. The marked up posters provided

an evidence record along with written feedback and my notes from the oral reviews. Research Question 1 also served as a tool to ensure resonance. Some Community Participants asked that Research Question 1 be included as a way for them to check whether I understood their perspectives. If I proved myself on Research Question 1, Community Participants were more likely to trust my findings on Research Question 2 that also included perspectives shared by Government Participants. Community Participants (19 out of 22 people) participated to a greater extent that Government Participants (4 out of 8 people) in the review of the preliminary findings, but the feedback I received indicated that my findings did make sense to them and, with some clarifications (e.g., leaving the section on unspoken laws and ceremonies at a high level because I am an outsider; see section 5.1.2.2) fully captured the significance of the ANF and the factors that influenced the adoption of the ANF.

3.4.4 Usefulness

Usefulness is a pragmatic criterion, referring to findings that improve peoples' daily lives and reveal additional research needs (Charmaz, 2014; Ford, 2010). Recommendations for future research are provided in section 8.4 above. MCFN and ACFN sought an understanding of the factors influencing ANF adoption to prepare for future revisions of the SWQMFLAR committed to by the GoA. Community Participant 3 described this research as useful because it reminded him of marriage counselling in that it communicated two separate sets of perspectives so that the two people (in this research, groups of people) could better understand each other and identify areas to talk about. He thought this was a novel approach that could help change how MCFN, ACFN, the GoA, and the federal governments discussed river navigability protections. If this research can help effect change by facilitating cross-cultural dialogue leading to protections of river navigability, then it is useful.

More broadly, this research could be useful in helping to expand environmental flow assessments in Canada by encouraging the diffusion of cultural flows as a tool to enhance Indigenous participation and broaden assessments' typically narrow eco-hydrological objectives. In Canada, environmental flow assessments are increasingly becoming a feature of legal and policy frameworks for freshwater (Harwood et al., 2014; Kidd et a., 2018), and alongside that trend is the call for enhanced Indigenous participation and accommodation of their specific environmental, social, and cultural goals (Kidd et al., 2018). Acknowledging the *As Long as the*

Rivers Flow Report, this research further documents a model that other Indigenous peoples within Canada (and other jurisdictions) could use to define and convey their flow needs associated with their socio-cultural interests and water-based livelihoods, adjusting for their particular circumstances, preferences, and needs. Particularly helpful is the use of river navigability as the objective because it provides a lens through which to protect waterways at a regional level rather than local, which is more common in the cultural flows literature. Further, this research documents measures that can be considered in the design of freshwater governance arenas to empower the use of cultural flows within environmental flow assessments for at least free-flowing rivers to enhance the self-determined participation of Indigenous peoples and inclusion of their interests. In short, this research helps facilitate the diffusion of cultural flows in Canada as a policy tool that enables a nation-to-nation relationships with state governments.

8.6 Conclusion

ANF offered a window into how the introduction of quantified cultural flows can bridge the divide between Indigenous peoples and federal and provincial governments within environmental flow assessments for free-flowing rivers. That bridge was achieved because Indigenous peoples undertook self-determined translations of their ways of being in waterscapes to express their interests in terms intended to be understandable and useable by federal and provincial governments. ANF were MCFN's and ACFN's translation of their conception of wellness consisting of the complex relationship between river navigability; boating as a vital capability; physical, intellectual, financial, spiritual, and emotional human health; caring-based kinship between peoples and between people and the environment; collective identity; continuing across change in self-determined ways; and treaty rights. In translating their wellness conception, MCFN and ACFN affirmed their own knowledge and knowledge exchange pathways, showing how reflexivity amongst their citizens provides benefits beyond the fulfillment of interests sought through adoption of cultural flows by federal and provincial governments. By introducing ANF to federal and provincial governments, MCFN and ACFN were able to honour the treaty relationship by explaining how they were impacted by water withdrawals from their home river, explaining their perspectives on treaty rights, and providing a clear mechanism for protecting treaty rights in ways they deemed meaningful. In short, ANF

served as a bridge within a cross cultural environmental flow assessment through MCFN's and ACFN's self-determined adaptation to needs of Western Science, affirmation gained by valuing their knowledge, and the honour they showed the treaty relationship.

ANF's function as a bridge revealed five ways in which cultural flows may be used to make environmental flow assessments for unregulated rivers meaningful for some Indigenous peoples. First, using cultural flows to inform environmental flow assessments provides an opportunity for ontological multiplicity, a condition that is contended by some researchers to be a solution for much of the conflict over freshwater experienced today (Baker & Westman, 2018; Wilson & Inkster, 2018; Yates et al., 2017). Achieving ontological multiplicity depends in part on cultural flows being recognized as indivisible translations from which pieces of information cannot be extracted without agreement by the Indigenous peoples who introduced the cultural flows. Second, vital capabilities of Indigenous peoples such as boating can be highlighted through cultural flows and subsequently explicitly accounted for in environmental flow assessments, not as benefits of a functioning ecosystem to be incorporated into a trade-off evaluation, but as integral to some Indigenous peoples' wellness. Third, cultural flow assessments provide Indigenous peoples with an opportunity to articulate and address their interests around self-determined change adaptation, a need intensified by climate change. Four, the expression of cultural flow needs provides an opportunity for Indigenous peoples to fulfill responsibilities they may have towards Indigenous and settler peoples and to engage in cross-cultural collaboration over how cultural flows are included in environmental flow assessments. Five, deliberately incorporating opportunities for Indigenous peoples to assess their cultural flow needs into the design of environmental flow assessments may help strengthen Indigenous peoples' internal knowledge sharing pathways, contributing to their self-determination aspirations. Clearly, cultural flows can meaningfully shape cross-cultural environmental flow assessments in multiple ways, but Indigenous peoples will decide whether and how cultural flows should be used within the context of environmental flows assessments for unregulated rivers.

The introduction of cultural flows into environmental flow assessments is only beginning to meet Indigenous peoples' interests because of individual, structural, and cultural institutional factors. ANF adoption was primarily influenced by a bounded inclusivity approach to policy-making that prioritized existing water rights held by oil sands companies over non-economic

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interests, a pattern observed across Alberta (Bruno, 2014; Unger, 2019). The resistance underpinning the bounded inclusivity approach to policy-making was supported by discretionary legal rules that together constrained the policy prescriptions that the GoA considered, especially prescriptions consisting of industry-wide water withdrawal cut-off thresholds such as the ANF. Reinforcing the structural barriers of resistance and legal rules, federal and provincial government representatives grappled with respectful use of Traditional Knowledge and whether bilateral interactions with Indigenous peoples were appropriate when a collaborative approach had been taken to make policy recommendations. Despite the structural and individual barriers created by unsupportive resistance and legal rules, MCFN and ACFN capitalized on structural and cultural drivers, including legal consultation obligations and the GoA's desire for legitimacy, through strong communications. Particularly influential were MCFN's and ACFN's joint communications grounded in strong governance structures, indicating that Indigenous peoples' self-determined and self-organized strategies for elevating their place in freshwater governance are effecting change. Overall, the IIF factors influencing the adoption of ANF were found to be partially aligned, with some barriers and drivers working at cross-purposes; hence, the adoption of modified ANF is consistent with the IIF premise that innovations are more likely to endure when factors across the categories are aligned.

Generalizable conclusions about the relative influence of the IIF factors and categories cannot be drawn at this time because this is the only study that has applied the IIF to adoption of cultural or environmental flows. However, insights from ANF adoption combined with studies that did not apply the IIF suggest that structural factors are instrumental in influencing cultural flows adoption and are shaped by cultural drivers and individual barriers. This overall pattern of factors is perhaps consistent with emphasis on Indigenous-state reconciliation in Canadian political discourse and federal and provincial governments' long struggles with meaningfully including Indigenous peoples and their Traditional Knowledge in freshwater governance. To confirm the overall pattern of factors influencing cultural flows adoption, the IIF needs to be applied to cases of cultural flows adoption in other colonial-settler jurisdictions. Doing so could also provide additional nuanced insight into activities that could enable the adoption of cultural flows that inform environmental flow assessments.

The patterns illuminated through the application of the IIF in this study suggest that efforts need to be directed at overcoming individual barriers if progress is to be made in the adoption of

cultural flows for free-flowing rivers in ways mutually acceptable to state governments in jurisdictions with colonial histories and Indigenous peoples. Since individual barriers mostly relate to incongruencies between Government and Community Participants' perspectives on using multiple knowledge systems together, understandings of wellness, and respectful engagement of Indigenous peoples within freshwater governance arenas, cultural competency training programs consistent with the Truth and Reconciliation Commission Call to Action #57 and Ermine's ethical space is one example of an action that could be taken to overcome individual barriers. Research into effective cultural competency training programs to develop humility and reflexivity is needed to effect change in the individual barriers. By focussing on overcoming individual barriers, state government representatives may be oriented towards altering structures such as the legal rules and resistance that block cultural flows adoption and repositioning Indigenous self-determination centrally within freshwater governance. Reorienting people and the structures within which they work is establishing ethical space, a need becoming greater as Canada seeks to implement the United Nations Declaration on the Rights of Indigenous Peoples.

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FIGURE 5.2 ATTRIBUTIONS

Images of plants, animals, insects, and other environmental components shown in Figure 5.2, except for the image of the muskrat, were downloaded from www.123rf.com under a Standard License between Sarah Baines and 123RF (https://www.123rf.com/license.php?type=standard). The muskrat image was downloaded from Creazilla under Creative Commons Attribution 4.0 International (CC BY 4.0) license. Specific attributions are listed below:

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GLOSSARY

Term	Definition
Aboriginal Navigation Flows	an example of a cultural flow that describes MCFN's and ACFN's collective and self-determined river flow needs framed as protections of their treaty rights within the unregulated Lower Athabasca River basin. ANF informed the environmental flow assessment for the Lower Athabasca River that in turn was the basis for the GoA's regulation of the surface mineable oil sands industry's consumptive freshwater use from the Lower Athabasca River.
Aboriginal rights	flow from Indigenous peoples' historical and continued occupation of territories within Canada since before colonization (Phare, 2009) and "must be interpreted flexibly so as to permit their evolution over time" (Gullason, 2018, p. 32). The degree of overlap between Aboriginal rights and inherent rights is debated: some argue that Aboriginal rights are inherent rights, while others argue that they are distinct because inherent rights are given to Indigenous peoples by their Creator and do not require validation by Canadian courts or law (Phare, 2009; Gullason, 2018).
Adoption	part of a policy process in which policy problems are recognized, potential solutions are identified and assessed, and a course of action is selected.
Bounded inclusivity	GoA's approach to policy-making consisting of integrating diverse interests only to the extent that they did not interfere with the GoA's pre-determined economic goals for the region.
Cultural flow assessments	processes through which Indigenous peoples translate their freshwater interests into hydrologic variables using culturally-respectful approaches so that their freshwater needs are more comprehensible to people outside their communities. Knowledge translation can be disrespectful (Nadasdy, 2003), but in cultural flow assessments knowledge translation is considered appropriate when knowledge holders complete or direct the translation (see MLDRIN, 2007).
Cultural flows	river flows or water amounts that achieve Indigenous peoples' self-determined interests.
Environmental flow assessments	processes for determining the flow regime to meet ecological, social, cultural, and economic objectives represented by environmental flows (adapted from Horne et al., 2018). In this thesis, the process for determining instream flow needs is considered an environmental flow assessment.
Environmental flows	flow regimes needed to sustain aquatic ecosystems which, in turn, support human cultures, economies, sustainable livelihoods, and well-being (after Arthington et al., 2018).
Freshwater governance	the range of institutions operating within ontological and political contexts through which information is gathered and evaluated and decisions about freshwater are made.
Implementation	putting into practice the selected course of action to achieve a policy's intended outcomes.
Indigenous wellness	the collective ability of the citizens of MCFN, ACFN, and FCM to continue through change in their preferred, self-determined ways that is secured through their exercise of their treaty rights. The ability to continue through change is fostered through the relationship between river navigability, boating, health, identity, vulnerability to change.
Influences	determining factors that affect a course of action (https://www.thefreedictionary.com/influence).
Innovation	manifestations of intentions to improve the human condition in some way (Howlett et al., 2009; Steelman, 2010) that, under the IIF, do not have to be entirely original provided they are new to the organization putting them into practice (Steelman, 2010).
Institution	structures, rules, laws, norms, and sociocultural processes that shape human actions (Steelman, 2010, p. 3).
Instream flow needs	the flow regime needed for full, long-term protection of the Lower Athabasca River aquatic ecosystem.
Interest	patterns of value demands and supporting expectations about the conditions for satisfying those demands (following Bischoff-Mattson et al., 2018, p. 236 as per the policy sciences).
Marginalization of Indigenous interests	neglect or superficial accounting of Indigenous peoples' emotional and spiritual relationships with water (Castleden et al., 2017); environmental, cultural, social,

	economic, and political needs (Castleden et al., 2017; Hemming et al., 2019); knowledge systems (Jackson, 2017; Phare, 2009); and Aboriginal and treaty rights (Castleden et al., 2017; Curran, 2019; Laidlaw & Passelac-Ross, 2010) within the institutional contexts through which decisions about freshwater are made.
Self-determination	Indigenous peoples' ability to freely determine their political condition and pursue their form of economic, social, and cultural development as described in Article 3 of the *United Nations Declaration on the Rights of Indigenous Peoples* (https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf).
State governments	refers to governments of countries or political subdivisions within a country such as provinces, territories, or states (https://www.dictionary.com/browse/government), and is used to differentiate governments of countries and their political subdivisions from Indigenous governments.
Traditional Knowledge	the collective knowledge held by a community of Indigenous people living today that has accumulated by listening to their ancestors and relationally experiencing the waterscape throughout their lifetimes. Traditional Knowledge can evolve as different experiences with the waterscape are accumulated and the social context within which those experiences occur change.
Treaty rights	rights derived from treaties considered to be legally binding and solemn agreements between Indigenous peoples and the Crown outlining each signatory's obligations and responsibilities towards the other (see Isaac & Annis, 2010).
Western Science	a knowledge system that decontextualizes objects of study, separating people from nature so that nature can be objectively known (Anderson et al., 2019).

APPENDIX A: COMMUNITY-BASED PARTICIPATORY RESEARCH PRINCIPLES

No.	CBPR Guiding Principles	Following the CBPR Guiding Principles
		Core CBPR Guiding Principles
1	Community recognized as the unit of identity defined by common interests, perspectives, or potentially geography (Hacker, 2013; Horowitz et al., 2009; Padgett, 2012)	The community was initially identified as the citizens of MCFN and ACFN because these two First Nations participated in the development of ANF concepts and jointly submitted the *As Long as the Rivers Flow Report* to the GoA. At the request of the 2015 MCFN Chief and Council, the community was expanded to include the FCM Local 125 because of their similar connection to freshwater and reliance on river navigability to that of the First Nations with territories in Fort Chipewyan.
2	Respect for knowledge as coming from multiple sources, and communities contribute their own skills, knowledge and resources to the research (Drawson et al., 2017; Hacker, 2013; Horowitz et al., 2009; Padgett, 2012)	The research was enriched by the strengths and resources of the community: • the Community-Based Monitoring Program provided a guided day tour through the Peace Athabasca Delta during which I learned about the history of the people, their observations and feelings about the waterscape, Indigenous water management approaches, and their experiences with researchers and research. This provided much needed contextual information to help me build relationships and conduct research in a respectful manner. • Individual community members increased my access to potential interviewees by providing direction on participant selection criteria (demographic and geographic diversity), suggesting names of potential participants, logistical support (venue selection, driving services), and taught me about cultural protocols that demonstrate respect for the knowledge holder. • Individual community members welcomed me to their cabins and homes and invited me to participate in a duck and moose hunts so that I could better understand their perspectives and ways of life before conducting data collection.
3	All phases of research are collaborative and egalitarian where knowledge and power is shared between the researcher and community (Hacker, 2013; Horowitz et al., 2009; Padgett, 2012)	Collaboration with community partners occurred in the following ways throughout the research process and was grounded in commitments made in signed research agreements between the University of Saskatchewan and the Indigenous research partners: • Problem identification: To identify potential projects that would be meaningful and helpful to the community, representatives of MCFN, ACFN and the FCM were asked at the 2014 Peace Athabasca Delta Ecological Monitoring Program meeting about the types of problems or questions they wanted explored. From this brainstorming emerged the question "Why didn't the GoA use the base flows in the policy?" Subsequent discussions with community leaders and Elders refined this question and it became incorporated into the research design. • Research questions: Research Questions 1a and 1b about the significance of ANF were added after Research Question 2 in response to community concerns that I may not understand their perspectives on river navigability, and freshwater management. Research Questions 1a and 1b served to demonstrate to the community how I understood their

No.	CBPR Guiding Principles	Following the CBPR Guiding Principles
		knowledge (constructivist approach) as well as provide a deeper understanding of the perspectives raised on adoption during data collection for Research Question 2. • Data collection: The community shaped data collection by (i) modifying the interview guide to include questions that explore the feelings of those interviewed about the waterscape and adoption; (ii) requesting that the FCM be included because of importance of boating to their culture as well; (iii) providing guidance on participant selection, including the demographic and geographic criteria and potential interviewee names; and (iv) advising on translation services, including preparing translators. • Data analysis: Community Participants did not participate in coding, but advice was sought on the use of the ESF as a guide to structure the analysis (it was supported). Community Participants also interactively reviewed with me the preliminary results presented in written form and visually as posters, confirming or providing further insights into the categories that emerged from the data. This visual-based approach was undertaken at the request of the Indigenous research partners who preferred visual presentations of information over written reports to make them more accessible to a wider audience. • Sharing of knowledge between research partners: Information exchange occurred through (i) a formal community coordinator who received updates from me and who kept me informed of important events happening in the community and how they may impact research activities; (ii) informally during my community visits and participation in community events; and (iii) formally through status updates on research activities as required by the research agreements. • Dissemination of research findings: Scientific means of disseminating information such as thesis production, conference presentations, and article writing were led by me, but community members have access to these materials via the Delta Dialogue Network website. Copies of the thesis will also be provided to the community directly. A video is being prepared in collaboration with community members about boating, and once completed, MCFN, ACFN and the FCM will be able to use and distribute the video as they see fit. Opportunities for collaborative article development will also be explored following the completion of this thesis. A community meeting in 2018 was also held to more broadly share preliminary results with the people of Fort Chipewyan.
4	Co-learning and capacity building among all partners (Hacker, 2013; Horowitz et al., 2009; Padgett, 2012)	The larger Delta Dialogue Network project of which this project on ANF concepts is a part contributed to community capacity building by hiring a community coordinator living in Fort Chipewyan; by facilitating the creation of a workshop involving Indigenous peoples from three Canadian inland deltas to discuss concerns and solutions for the waterscapes; and creation of a travelling exhibit showcasing the perspectives and experiences of the Indigenous peoples (http://www.usask.ca/research-groups/ddn/). As a member of the teams helping with these initiatives, I also had the opportunity to learn from the Indigenous peoples about their experiences in their deltas

No.	CBPR Guiding Principles	Following the CBPR Guiding Principles
		and the role that these initiatives can play in improving relationships between academia and Indigenous communities from their perspectives (see Steelman et al., 2019). Joint capacity building for this research project on ANF occurred through the development of research agreements with MCFN, ACFN, and FCM. Through meetings, I learned what was important to the community (e.g., ownership and storage of their knowledge through the Knowledge Keepers Database) and the community learned about some of the limitations of an academic setting (e.g., how a thesis is defended and approved). The learning that began with the research agreements continued through ongoing visits to the community. In total I spent 13 weeks in the community over the course of the project, including 3 weeks prior to the start of data collection to learn about the community. The community increased my understanding of their ways of life and capacity to undertake respectful research by informing me about culturally appropriate ways of approaching and talking with people; encouraging to see myself as a Treaty person; allowing me to share in some parts of their daily lives through boat tours, cabin visits and hunting trips; and increasing my access to members of the community by introducing me to people and through logistical supports (e.g., transportation).
5	Exploration and consideration of the broader, contextual conditions within which an issue is set (Drawson et al., 2017; Hacker, 2013; Horowitz et al., 2009)	Consideration of ANF concepts occurred during the final phase of SWQMFLAR development from 2010-2015, but data from documents and participants in earlier policy phases (CEMA Phase 1 and the P2FC) were included to provide the contextual information needed to understand when, how and why river navigability concerns emerged prior to 2010. Government and Community Participants also referred to prior decisions, actions, and learning that took place during these earlier policy phases to explain their perspectives on ANF adoption during interviews. These points became lines of inquiry followed as part of the iterative data collection and analysis process characterizing constructed grounded theory.
6	Open and iterative processes allow for new lines of inquiry to emerge and be investigated (Hacker, 2013; Horowitz et al., 2009)	The constructivist grounded theory approach used in this research supported this CBPR principle by facilitating an open and iterative approach from which emerged the addition of a new research question (Research Questions 1a and 1b) and lines of inquiry related to category development (e.g., learning about the role and use of TK in freshwater policy-making over time by Government Participants). This CBPR principle also refers to the emergence of lines of inquiry to be explored as part of subsequent research projects. Further research needs are described in section 8.4.
7	Commitment to long-term relationships (Hacker, 2013; Horowitz et al., 2009; Padgett, 2012)	Relationships were nurtured outside of the project by attending non-research related functions (e.g., Métis fiddling events, Fort Chipewyan Winter Carnival), using local accommodations versus the Parks Canada accommodations, and ongoing maintenance of friendships with some community members through letters and phone calls. I also hope that the video will be helpful beyond the closure of this project.
	CBPR Guiding Principles adapted to working with Indigenous Communities	

No.	CBPR Guiding Principles	Following the CBPR Guiding Principles
8	Be responsible by recognizing the impact and current influence of the colonial past, including recognizing issues of power and privilege, tendencies of victim blaming, and tendencies to portray Indigenous peoples as victims (Carjuzaa & Fenimore-Smith, 2010; Drawson et al., 2017)	I have not experienced the impacts of Canada's colonial history on MCFN, ACFN, or the FCM, but Melody Lepine of MCFN reminded me at the start of this research that "we are all Treaty Peoples". This statement was operationalized through the choice of theoretical framing grounded in reconciliation (ESF); the decision to use CBPR and constructivist grounded theory approaches that encourage action on real world problems and that acknowledge the researcher as one voice in the research process; and by selecting the Implementing Innovation Framework that includes structural factors explicitly addressing power relationships. This thesis does contain descriptions about some of the challenges that Indigenous peoples have faced due to colonization and declining freshwater levels, but the thesis also describes the self-determined actions that MCFN and ACFN have undertaken to address some of the challenges they face. By presenting the challenges and self-determined actions together that I am not portraying MCFN and ACFN citizens as victims.
9	Recognize the researcher as first listener and then as storyteller who imparts their own life and experience into the telling. Underpinning this principle is the need to acknowledge that generalizability should not always be the goal of research unless agreed to by the research partners (Carjuzaa & Fenimore-Smith, 2010; Lavallee, 2009; Wilson, 2008).	Constructivist grounded theory was selected as the approach because it is part of the interpretative tradition, acknowledging that data is co-constructed by the researcher and research participants and that an interpretative framing of a phenomenon results from the project rather than a positivistic explanatory theory.
10	Researcher needs to be vulnerable and open to letting themselves be known (Carjuzaa & Fenimore-Smith, 2010; Wilson, 2008)	I opened myself to be known by (i) sharing information about my family, the places that I have lived, where I have worked, and my future plans at the start of meetings and interviews; (ii) spending time with people outside of research activities in their homes and cabins; (iii) participating in community events and daily activities such as boating and hunting trips; and (iv) staying in contact with some community members through letters, text messages, and telephone calls both during and after project closure.
11	Respectfully incorporate Indigenous ways of knowing in the research by: • recognizing that knowledges held by Indigenous peoples evolves • recognizing that Indigenous peoples have a relational way of being (Carjuzaa & Fenimore-Smith, 2010; Wilson, 2008)	The term "Traditional Knowledge" is used in this thesis, but it is not meant to imply that knowledge held by Indigenous peoples is outdated or static. Rather, this term is used here to align with the terminology of the MCFN and ACFN community-based monitoring programs. The knowledge gathered from Indigenous peoples was understood to represent the collective knowledge held by people living today accumulated by listening to their ancestors and relationally experiencing the waterscape throughout their lifetimes. Thus, Traditional Knowledge can evolve as different experiences with the waterscape are accumulated and the social context within which those experiences occur change. My interpretations of the relational worldviews of MCFN, ACFN and the FCM pertaining to river navigability are depicted in Figures 5.1 and 5.2. These figures show the interrelatedness of river

No.	CBPR Guiding Principles	Following the CBPR Guiding Principles
		navigability, caring, connectivity, identity, cultural longevity, and wellness, and they are presented as checks on my understanding of the knowledge that Indigenous peoples shared with me. These figures are not meant to tell the Indigenous peoples about their own relationality, but to act as checks on my understanding of the relationality for the Indigenous research partners.
12	Respect the sovereignty of Indigenous peoples by: • recognizing their authority to regulate research and researchers on their lands • recognizing their authorities over data ownership, control, access, and possession • recognizing that concern for the rights and well-being of individual participants ignores the communal nature of Indigenous cultures and the values and responsibilities within these social structures (Carjuzaa & Fenimore-Smith, 2010; LaVeaux & Christopher, 2009; Cochran et al., 2008)	Research agreements with MCFN, ACFN, and the FCM were developed after I was given permission to undertake the research in partnership with their citizens. The research agreements included requirements for data management: • All data collected from Indigenous participants (audio recordings, transcripts, and field notes) was to be returned to the designated offices upon project closure. To ensure that Indigenous data control and access is not compromised, I am to destroy all hard or electronic data in my possession by 2020. • All community and government participants were asked whether they wanted to keep their data confidential. While many community participants preferred that their names be attached to their data, some preferred confidentiality. These differences in participant preferences and the need to respect the communal nature of Indigenous cultures were not fully reconciled in the thesis. To partially address this limitation, pseudonyms were used in the thesis, but the video identifies people.
13	Respect the need for ceremonial offerings and other culturally appropriate behaviours and activities as directed by Indigenous research. partners (Cochran et al., 2008; LaVeaux & Christopher, 2009; Wright et al., 2016)	Respectful behaviours included the use of translation services when participants preferred to speak in their language, provision of food during interviews and meetings, participation in prayers when deemed appropriate by the Community Participant, did not interrupt the participants' telling of stories, and presentation of organic tobacco when I asked individuals to share their knowledge and experiences with me. To demonstrate my attempts at showing respect for research participants and culturally appropriate behaviours, here is a description of one initial interview that occurred over three different days: *The research participant is an Elder who grew up in the bush and is very active in his community. He requested that the interview be held in my B&B one evening after supper. When he arrived, I offered him tea and baked goods, offered tobacco, and ensured he was comfortable with the setting. He agreed to be recorded, but he asked that I not take notes because it is more important that I listen to him. For about three hours he told me stories about growing up in the bush and he asked me about my life. We shared photographs of the people in our lives and the places that we have been. All of a sudden he stood up, shook my hand, told me*

No.	CBPR Guiding Principles	Following the CBPR Guiding Principles
		he would be back tomorrow morning, and left. I was not sure what happened or if anything was wrong, but I shut off the recorder and went to bed. First thing the next morning, he knocked on my door and settled himself in the chair. The recorder was turned on, but I did not take notes. For seven hours, he told stories related to the discussion topics. Sometimes I could not understand the connection between the story and the topic right away, but as the story progressed it always was relevant. For lunch, I offered to cook him a meal. He accepted the offer, wondering what I was going to cook as he "doesn't eat white people food very much". While I cooked, he continued to tell his stories. When the food was cooked, he said a prayer, and we ate quietly together. After lunch, we walked to the lake shore, still recording our conversation. We sat and watched the water, sharing stories, and asking each other questions. In mid afternoon, he informed me he was tired and was leaving. About three days later, I received a phone call from him, inviting me to his house. I spent about four hours there, looking at his family photos, documents and maps beginning from the time of treaty to present day. He cooked his great grandson some moose meat and gave me bannock. We talked some more, and then he gave me a map showing place names in his language. His gift signalled the end of the conversation, and so we hugged and said goodbye. *During our many hours together, we talked about boating, the health of the water, and what it is like living in Fort Chipewyan now and in the past. He told me stories about residential school, his wife dying, and the stories that his grandfather told him about the day the treaty was signed (his grandfather was at the treaty signing in 1899). He talked about what he wants for his family and community in the future and what he feels needs to happen for that vision to be achieved. The information he shared did more than answer the interview questions because it was woven into his life story and visions. I feel that together we created a culturally appropriate sharing space that allowed both of us to open up to each other and really hear what was being said.*

APPENDIX B: VIDEO CO-DEVELOPMENT AGREEMENT

Below is a portion of the front page of the video co-development agreement. For privacy reasons, the entire document is not provided.

Community Perspectives on Navigational Challenges

Agreement between:

Sarah Baines

And

Athabasca Chipewyan First Nation – Dene Lands and Resource Management

Lisa Tssessze - Director

Mikisew Cree First Nation – Government and Industry Relations

Melody Lepine - Director

Métis Local 125

Kendrick Cardinal

Preamble:

Sarah Baines and Bruce Maclean are committed to producing a video with the peoples of Fort Chipewyan, including MCFN, ACFN, and FCM, that explores the importance of boating and river navigability to their citizens during the 2020-2021 open water season.

The video will occur under the Mikisew Cree First Nation and the Athabasca Chipewyan First Nation community-based monitoring programs. This work will help improve the refinement of the Aboriginal Extreme Flow, and the Geokeeper - Navigational Hazard Tracking work, and enhance community engagement and feedback on the navigation. Communities will be able to use the video to help communicate to a broad range of audiences about the special relationship that the Nations have with the Peace Athabasca Delta and area, and describe how this unique relationship to the various waterways allows for such vibrant cultures to flourish; as well as identify some of the threats to this use that exist.

APPENDIX C: EVIDENCE OF A CONSTRUCTIVIST GROUNDED THEORY STUDY

	CGT Strategy (Charmaz, 2014, p. 15)	Research Question 1a and 1b	Research Question 2
1	Conduct data collection and analysis simultaneously in an iterative process	Yes. Document analysis was undertaken before, during, and after the interviews to identify new and confirm emerging codes and lines of inquiry for subsequent interviews and document reviews in an iterative process. Interviews and their analysis were also iterative, with the majority of Community Participants interviewed twice so that the categories and patterns from the initial semi structured interviews could be more deeply explored in follow up interviews. Six Community Participants also participated in the initial semi-structured interviews over multiple but not consecutive days, which provided an opportunity to follow up on categories and patterns emerging from interviews completed between their sessions. Due to fieldwork constraints there was insufficient time between many of the semi-structured interviews to prepare and analyze a verbatim transcript. However, between interviews, audio recordings were listened to repeatedly to identify potential codes and lines of inquiry. These ideas were captured in field-based memos (Appendix F).	Yes. Document analysis was undertaken before, during, and after the interviews to identify new and confirm emerging codes and lines of inquiry for subsequent interviews and document reviews in an iterative process. Community Participant interviews were iterative, with analysis being conducted in between the sessions. The majority of Community Participants were interviewed twice (initial semi structured interviews and follow up interviews on the categories and patterns emerging from the analysis). Four Community Participants also participated in the initial semi-structured interviews over multiple but not consecutive days, which provided an opportunity to follow up on themes and patterns emerging from interviews completed between their sessions. Analysis of Government Participant interviews was iterative, with categories and patterns from earlier initial semi-structured interviews informing later initial semi-structured interviews. Follow up on emerging categories and their properties occurred primarily through written exchanges, but four follow up interviews were completed. When there was insufficient time to prepare and analyze a verbatim transcript between initial semi-structured interviews, the audio recordings were listened to repeatedly to identify potential codes and lines of inquiry. These ideas were captured in field-based memos (Appendix F).
2	Analyze actions and processes rather than themes and structures	Yes. Using gerunds as much as possible, I coded for actions as shown in the example from an initial semi-structured interview below. My action codes are in bold text.	Yes. Using gerunds as much as possible, I coded for actions as shown in the example below. My action codes are in bold text.

CGT Strategy (Charmaz, 2014, p. 15)	Research Question 1a and 1b	Research Question 2
	CP6: Have to take the long way now, maybe take two or three hours now that used to take less than an hour **(Being forced to travel longer routes)** *going around so many sandbars, getting stuck* **(Getting stuck in sand)** *so my kids don't want to go out with me any more* **(Losing family time on the water)** *having to push through sand bars* **(Boating becoming threatening)**	*GP6: Building on the previous question, I think, um, once we started taking this through the engagement process and began to more fully appreciate the intent or the expectations of First Nations community* **(Appreciating expectations) (Realizing the learning potential of interactive engagement)**, *we actually turned back to our technical experts* **(Relying on technical experts)**. *Um, in terms of how we might best incorporate for those numbers and we put the, um, we put the challenge to them to consider what might be effective means of doing so* **(Retrofitting policy choices)**
3 Use comparative methods	Yes. Comparative methods were used: data were compared with data, codes with codes, incidents with incidents, and cases with cases.	Yes. Comparative methods were used: data were compared with data, codes with codes, incidents with incidents, cases with cases, and between government and community narratives as detailed in Chapter 6.
4 Draw on data in service of developing new conceptual categories	Yes. Line-by-line coding helped prevent the application of only extant concepts to the data and focussed coding helped advance conceptual categories by locating critical extant codes or facilitating the emergence of new categories that encompass a group of common line-by-line codes. Building on the coding example for criterion 2 above, the first three codes, including "being forced to travel longer routes", "getting stuck in the sand", and "losing family time on the water" became properties of the category "boating becoming threatening". As focussed coding continued, "boating becoming threatening" was eventually subsumed under the category of "struggling with daily activities", and then "not caring for each other". Note that these descriptions of how codes were organized do not represent the final analysis, but rather my thinking at a particular point in time in the analysis.	Yes. Line-by-line coding helped prevent the application of extant concepts to the data and focussed coding helped advance conceptual categories by locating critical extant codes or facilitating the emergence of new categories that encompass a group of common line-by-line codes. Building on the example on criterion 2 above, the four codes identified were organized as follows: • "appreciating expectations" became a property of "realizing the learning potential of interactive engagement", which was then split into and subsumed under two categories: "establishing rapport" and "reframing perceptions of experiential knowledge". • "relying on technical experts" became a property of "retrofitting policy choices" but was then reorganized to be a property of "braiding with Western Science translators". Note that these descriptions of how codes were organized do not represent the final analysis, but rather my thinking at a point in time in the analysis.
5 Develop inductive abstract analytic	Yes. Data analysis was systematic and documented through photographs, case-based field memos and	Yes. Data analysis was systematic and documented through photographs and case-based memos and conceptual memos.

CGT Strategy (Charmaz, 2014, p. 15)		Research Question 1a and 1b	Research Question 2
	categories through systematic data analysis	conceptual memos. Clustering completed on a whiteboard were photographed and sketched into memos. Also see notes under criterion 4.	Clustering completed on a whiteboard were photographed and sketched into memos. Also see notes under criterion 4.
6	Emphasize theory construction rather than description or application of current theories	Yes. There is a growing body of literature on cultural flows (see Jackson, 2017; Weir, 2016) and theories of Indigenous wellness have been developed (FNIGC, 2012). However, river navigability is a unique means of representing the freshwater requirements of an Indigenous group and the importance of such a tool to Indigenous peoples has not been researched. Thus, there is space for theory construction related to the significance of ANF to its Indigenous developers. Using the CGT data collection and analysis strategies, analytic categories describing actions and processes were developed, ultimately showing that ANF were a bridging tool for simplifying complex freshwater needs into a quantitative form, strengthening internally held esteem, and building external relationships.

The developed categories are based on the combined perspectives of ACFN, MCFN, and the FCM, which the community acknowledge to be similar in terms of the importance of river navigability and views on ANF. This suggests that although the categories are for a specific case study, they have relevance across Indigenous groups. Further research is required to substantiate that claim. | Partially. The literature on cultural flows has been growing over the last 15 years, but very few studies have explicitly and empirically examined adoption of a quantified cultural flows for unregulated rivers, especially in Canada. This research sought to deeply understand cultural flows adoption in a colonial context based on a single case that could then be tested against other cases to develop and refine a more formal theory.

In this project, some of the CGT strategies were used to understand perspectives on ANF adoption from the perspectives of government decision-makers and Indigenous perspectives. Core and subcategories were identified (Appendix G), but the Implementing Innovation Framework was superimposed over the categories to determine the fit of that framework. This approach tested the Implementing Innovation Framework in an Indigenous context, which had not been done before, but this meant that current theories were applied and a grounded theory was not developed here. |
| 7 | Engage in theoretical sampling | Yes. Data focussing on categories and their properties were gathered through (i) initial semi-structured interviews that were conducted over multiple days (the latter sessions provided opportunities to follow up on emerging categories and patterns); (ii) follow-up interviews with the majority of Community Participants; and (iii) iterative document reviews that occurred before, during, and after the interviews. New documents were sought to address emerging categories and lines of inquiry throughout data collection and analysis. Analysis was considered complete when saturation was achieved, identified as the point when | Partially because theoretical sampling was limited for the government narrative.

Theoretical sampling to develop the categories and their properties for the community narrative occurred through (i) initial semi-structured interviews that were conducted over multiple days (the latter sessions provided opportunities to follow up on emerging categories and patterns); (ii) follow-up interviews with the majority of Community Participants; and (iii) iterative document reviews that occurred before, during, and after the interviews. New documents were sought to address emerging |

CGT Strategy (Charmaz, 2014, p. 15)		Research Question 1a and 1b	Research Question 2
		no new categories or properties of categories were revealed by new data (Charmaz, 2014).	categories and lines of inquiry throughout data collection and analysis. Analysis was considered complete when saturation was achieved, identified as the point when no new categories or properties of categories were revealed by new data (Charmaz, 2014). Data focussing on categories and their properties for the government narrative were gathered from Government Participants primarily through written exchanges, but four follow up interviews were completed. This limited theoretical sampling using interview data was only partially ameliorated by the extensive document review that was used to corroborate and deepen the interview data and data collected during earlier document reviews.
8	Search for variation in the studied categories or process	Yes. Through constant comparison and theoretical sampling, variations between categories or in the properties of categories were identified. For example, early focussed coding indicated the category "listening to knowledge holders" because Elders and active river users respected for the way this listen to freshwater were considered the teachers of the Indigenous cultures. I probed more deeply into this cultural norm during the later initial semi-structured interviews, revealing a new dimension of the interactions between Elders and their communities: "asking knowledge holders" because actively seeking out Elders' knowledge was considered a sign of respect. The community cannot assume Elders will always speak up without being asked.	Yes. Through constant comparison and theoretical sampling, variations between categories or in the properties of categories were identified. For example, the category of "seeing a limited role for TK" from one interview was compared with the category "appreciating TK as a tool" from another interview. Comparing these categories, which both related to perceptions of TK held by Government Participants, prompted me to probe into why such different perspectives were held. Ultimately these two codes were subsumed by the category "learning to appreciate TK through exposure".
9	Pursue developing a category rather than covering a specific empirical topic	Yes. Core categories for Research Question 1a emerged: "navigating for wellness" and "running wellness aground". These core categories reveal a worldview where boat use is more than an economic or recreational endeavour. Rather, wellness is intimately linked to river navigability and water travel from an Indigenous standpoint.	Partially. CGT methods were used to explore adoption of a cultural flow, and from the analysis one core category for the government narrative and two core categories for the community narrative emerged. These core categories were termed 'keystone factors' for this research because they represented the driving action leading to GoA's adoption of ANF. Around these keystone factors were subcategories of influences that worked to reinforce or undermine them. The CGT analysis is presented in Appendix

CGT Strategy (Charmaz, 2014, p. 15)	Research Question 1a and 1b	Research Question 2
	A core category for Research Question 1b emerged, "bridging for wellness", but it is less original because well-being is included in the internationally recognized definition for environmental flows (cultural flows are a related concept). However, there are few examples of cultural flows in Canada and fewer studies on their adoption by state governments. Thus, explicating a common code but in a different context adds to the cultural flows literature growing mostly from work in Australia and New Zealand.	G diagrammatically, but as the narratives were subsequently organized using the Implementing Innovation Framework, this study is labelled as a partial pursuit of developing a category.
Final classification (fulfilling criteria 1-5 is evidence of a CGT study according to Charmaz (2014)	**Yes, there is sufficient evidence of a constructivist grounded theory study, with the generation of a substantive but not formal theory.**	**Yes, constructivist grounded theory methods were partially used, but a grounded theory was not developed.**

APPENDIX D: GUIDES FOR THE INITIAL SEMI-STRUCTURED INTERVIEWS

Interview Guide for Community Participants

Note: Aboriginal Navigation Flows (ANF) is the collective term for the Aboriginal Base Flow and Aboriginal Extreme Flow presented in the report sometimes referred to as the *Candler Report* or the *As Long as the River Flow Report*.

REF. NO.	QUESTION
Discussion to help me get to know you a little and what boating means to you.	
A1	Tell me a little about yourself.
A2	Why is boating important to you? How does boating make you feel?
A3	What is boating like now? What was boating like in the past? How do you feel about that?
Discussion to help me understand how and why Aboriginal Navigation Flows were developed.	
B1	How have you been involved in the ANF? (note: review the ideas with them if the terminology is not familiar because they may use different words)
B2	Why were the ANF figured out?
B3	Who came up with the idea for the ANF?
B4	How were the ANF figured out?
B5	Why are the ANF important to you? To the community?
Discussion to help me understand your experiences working with government representatives.	
C1	What was it like working with government representatives on ANF? How did that make you feel?
C2	How did the governments react to ANF? How were these ideas used? How did that make you feel?
C3	Why do you think the governments reacted that way?
Discussion to help me understand your thoughts on the use of ANF as a water management tool.	
D1	What will happen (to the water, to you, to the community) if the government uses the ANF as a water withdrawal rule? How would that make you feel?
D2	What will happen (to the water, to you, to the community) if the ANF are not used as a water withdrawal rule? How would that make you feel?
D3	What is needed for the government to impose water withdrawal rules using the ANF?
Discussion to help me understand your thoughts on the Aboriginal Navigability Index (ANI) that was included in the Surface Water Quantity Management Framework for the Lower Athabasca River.	
E1	How did you learn about the ANI? What does it mean to you?
E2	Why did the Alberta government develop the ANI?
E3	What do you think about the ANI as a way to manage water levels in the Athabasca River?
General Questions	
F1	Do you have any questions for me?
F2	Should I talk to any other people or groups from your community, the government agencies, or others?
F3	Are there any reports, letters or other documents that I should read to help me understand your comments?

Interview Guide for Government Participants

Note: Aboriginal Navigation Flows (ANF) is the collective term for the Aboriginal Base Flow and Aboriginal Extreme Flow presented in the report sometimes referred to as the *Candler Report* or the *As Long as the River Flow Report*.

REF. NO.	QUESTION
Discussion about your and your organization's role(s) in management of the lower Athabasca River area.	
A1	What is your organization's mandate and jurisdiction with respect to management of the lower Athabasca River?
A2	What is your role within your organization?
A3	How does consideration of ANF fit within the mandate and jurisdiction of your organization?
Discussion to help me understand how you know about ANF and how your work related to ANF.	
B1	How did you become familiar with ANF?
B2	Why do you think ANF was developed and introduced?
Discussion to help me understand the process that your organization went through to make a decision on ANF.	
C1	How did your organization evaluate the use of ANF as a water management tool?
C2	What was the process for evaluating ANF like? How did it go?
C3	How would you describe your communications and interactions with other government agencies and Aboriginal groups about ANF?
C4	How did your organization respond to recommendations that ANF be used as a water management tool?
Discussion to help me understand the effects of ANF as a water management tool.	
D1	What would be the outcomes if ANF was incorporated into policies as a water management tool? What are the outcomes if ANF is not used as a water management tool?
Discussion to help me understand your perspectives on the Aboriginal Navigability Index that was included in the Surface Water Quantity Management Framework for the Lower Athabasca River?	
E1	How did you become familiar with ANI? What role did your organization play in its development?
E2	Why was ANI developed?
E3	What are your perspectives on ANI as a water management tool for the lower Athabasca River?
E4	How does the Aboriginal Navigability Index address the reasons why the MCFN and ACFN developed ANF?
General questions:	
F1	Do you have any questions for me?
F2	Are there any other people or groups that I should interview?
F3	Are there any reports, letters or other documents that I should read to help me understand?

APPENDIX E: DOCUMENT INVENTORY

Notes:

(1) All documents are on file with the author.

(2) All documents are also publicly available except for the following two documents that were provided by community participants:

- Community-Based Water-Depth Monitoring in the Peace-Athabasca Delta: Insights and Evaluation, July 2016
- Letter to Pat Marriott, Senior Water Advisor, Alberta Energy Regulator from ACFN regarding completion of CEMA research on the Athabasca River prior to the issuing of any further water withdrawal licences, February 12, 2015

(3) The phrase "relevant narrative" in the column labelled Research Question 2 refers to the Community and Government narratives on GoA's adoption of ANF presented in Chapter 6. When 'both' is used, the reference document was analyzed for both the Community and Government narratives.

DOCUMENTS							
Document	Author(s)	Publication Date	Research Question 1a	Research Question 1b	Research Question 2 (relevant narrative)	Analyzed	Rationale for Analysis
Letter to Stacey Smythe, Senior Manager, Engagement and Relationships, Aboriginal Engagement and Planning, Stewardship Branch, AESRD, regarding consultation on the SWQMFLAR with attached report titled *Surface Water Quantity Management Framework for the Lower Athabasca River (GoA & Dept. of Fisheries and Oceans) Technical Review*	Letter prepared by Sebastien Fekete of MCFN Report prepared by Dr. Martin Carver for ACFN Industry Relations Corporation and MCFN Government and Industry Relations office	Letter dated November 14, 2014 Report dated May 28, 2014	Yes	Yes	Yes - Community	Yes	Directly addresses river navigability and ANF. Describes MCFN and ACFN perspectives on government actions.
As Long as the Rivers Flow: Athabasca River Use, Knowledge and Change, MCFN Community Report	Craig Candler, Rachel Olson, Steve DeRoy, and the Firelight Group Research Cooperative with the Mikisew Cree First Nation	August 16, 2010	Yes	Yes	No	Yes	Proposes ANF with rationale

Mikisew Cree First Nation Submission, October 1, 2012, In the Matter of Energy Resources Conservation Board Application No. 1554388, and In the Matter of Alberta Environment Environmental Protection and Enhancement Act Application No. 005-00153125, 006-0015325, and In the Matter of *Water Act* File No. 00186157, and In the Matter of Fisheries and Oceans Canada Section 35(2) Authorization Application Components of submission: Mikisew Cree written submission; Treaty 8 documents; Mikisew Cree First Nation Indigenous Knowledge and Use Report and Assessment for Shell Canada's Proposed Jackpine Mine, Pierre River Mine, and Redclay Compensation Lake; and intergovernmental correspondence regarding cumulative effects	Submission prepared by Prowse Chowne LLP (Donald P. Mallon), Q.C. & Janes Freedman Kyle Law Corporation (Robert Freedman & Mark Gustafson) with the MCFN Traditional Knowledge and Use Study: Craig Candler (Ph.D) and the Firelight Group Research Cooperative with the Mikisew Cree First Nation (MCFN)	February 15, 2012	Yes	Yes	No	Yes	Directly addressed the importance of water quantity to maintaining knowledge, identity
Athabasca Chipewyan First Nation and Mikisew Cree First Nation Review of the Phase 2 Framework Committee Recommendations: Synthesis Report	ACFN Industry Relations Corporation; MCFN Government and Industry Relations office, Martin Carver, Aqua Environmental Associates; Craig Candler, The Firelight Group; Tom Boag, Applied Aquatics Research Ltd.	July 2010	Yes	Yes	No	Yes	Establishes rationale for ANF development
Community-Based Water-Depth Monitoring in the Peace-Athabasca Delta: Insights and Evaluation	Prepared by Aqua Environmental Associates for Athabasca Chipewyan First Nation and Mikisew Cree First Nation (Authors are Dr. Martin Carver and Bruce Maclean)	July 2016	Yes	Yes	No	Yes	Describes the role river navigability plays in the lives of MCFN and ACFN citizens; Research Question 1a and 1b not bounded by time frame
Statement of Concern and Comments on the Integrated Assessment submitted to the Canadian Environmental Assessment Agency and Alberta Environment and Water from the Athabasca Chipewyan First Nation Components: Athabasca Chipewyan First Nation Integrated Knowledge and Land Use Report and Assessment for Shell Canada's Proposed Jackpine	Authors for Knowledge and Land Use Report: Craig Candler (Ph.D) and the Firelight Group Research Cooperative with the Athabasca Chipewyan First Nation As Long as the Rivers Flow Community Report: Craig Candler, Rachel Olson, Steve DeRoy and the Firelight Group Research Cooperative, with the Athabasca Chipewyan First Nation	June 4, 2012 for entire package Knowledge and Land Use Report: April 20, 2011 As Long as the Rivers Flow Community Report: August 16, 2010	Yes	Yes	No	Yes	Addresses importance of river navigability and purpose of ANF

Title	Author(s)	Date					Notes
Mine Expansion and Pierre River Mine; As Long As The Rivers Flow: Athabasca River Use, Knowledge and Change, ACFN Community Report							
Mikisew Cree First Nation Indigenous Knowledge and Use Report, and Assessment for Teck Resources Limited's Proposed Frontier Oil Sands Mine Project and addendum	Craig Candler, Ph.D., Rachel Olson Ph.D. and the Firelight Group Research Cooperative with the Mikisew Cree First Nation (MCFN) Addendum: Craig Candler, Ph.D., Molly Malone, Ph.D. and the Firelight Group Research Cooperative with the Mikisew Cree First Nation (MCFN)	November, 2013 Addendum: May 28, 2015	Yes	Yes	No	Yes	Directly addresses river navigability and ANF report
Report to the Cumulative Environmental Management Association, Wood Buffalo Region, On the Use of Traditional Knowledge in Project Planning and Implementation in the Athabasca Oil Sands Areas Including the Communities of Fort McKay, Fort McMurray, Anzac, Fort Chipewyan, Gregoire Lake, and Janvier	The SCI-TEK Partnership, Joanne Barnaby and Alan Emery	October 2001	Yes	No	Yes - Both	Yes	Research Question 1a - importance of using waterways Research Question 2 - Seeking TK (motivation) and learning how to use TK in decision-making
Athabasca Chipewyan First Nation (ACFN) Technical Review – Jackpine Mine Expansion Project Components included in review: Review of the Socio-economic and Traditional Land Use Assessments for the Shell Canada Energy Applications for Approval of the Jackpine Mine Expansion and Pierre River Mine	Multiple authors. Dr. James Tanner, Twin River Consulting: Review of the Socio-economic and Traditional Land Use Assessments for the Shell Canada Energy Applications for Approval of the Jackpine Mine Expansion and Pierre River Mine	February 11, 2010	Yes	No	No	Yes	Discusses the importance of using waterways; Research Question 1a not bounded by a timeframe
Fort Chipewyan Métis Local 125 Métis Land Use and Ecological Knowledge Study	Fort Chipewyan Métis Local 125 and Kim Dertien-Loubert of Woven Paths Consulting Inc.	July, 2015	Yes	No	No	Yes	Discusses the importance of using waterways; Research Question 1a not bounded by a timeframe
Barb Hermanson: Her Story, The Last Woman to Raise Children on the Athabasca River	Sherri Labour and Barb Hermanson for Fort Chipewyan Métis, Local 125	June, 2011	Yes	No	No	Yes	Discusses the importance of using waterways; Research Question 1a not bounded by a timeframe
Fort Chipewyan Métis, Local 125 Cultural Impact Assessment	Integral Ecology Group, Ltd.: Ann Garibaldi, MSc, Ethnobotanist/Ethnoecologist, Thomas Dyck, MA, PhD Candidate, Applied Human Ecologist, Geographer Kevan Berg, PhD,	October 30, 2015	Yes	No	No	Yes	Discusses the importance of using waterways; Research Question 1a not

	Ethnoecologist Shanti Berryman, PhD, Community Ecologist, Community Engagement Specialist						bounded by a timeframe
Traditional Use Mapping of the Lower Athabasca River: Phase 1 Study	WRG Westland Resource Group Inc. for CEMA's Socio-Economic Task Group	July 6, 2009	No	No	Yes - Both	Yes	An initiative to obtain TK; articulates the positions of MCFN, ACFN and the FCM on the P2FC and TK collection efforts
Framework for Water Management Planning (includes the Strategy for the Protection of the Aquatic Environment)	Alberta Environment (Edmonton)	2001	No	No	Yes - Government	Yes	Identified as relevant by the SWQMFLAR; describes government priorities
Water for Life: Alberta's Strategy for Sustainability	GoA (Environment in Edmonton)	November 2003	No	No	Yes - Government	Yes	Identified as relevant by the SWQMFLAR; guides perspectives on instream flow needs and freshwater policy-making
Water for Life: a renewal	GoA (Environment in Edmonton)	November 2008	No	No	Yes - Government	Yes	Identified as relevant by the SWQMFLAR; guides perspectives on instream flow needs and freshwater policy-making
Land-use Framework	GoA (Land Use Secretariat in Edmonton)	December 2008	No	No	Yes - Government	Yes	Identified as relevant by the SWQMFLAR
Alberta Environment, Fisheries and Oceans Canada Water Management Framework: Instream flow needs and water management system for the Lower Athabasca River	Alberta Environment (Edmonton)	February 1, 2007	No	No	Yes - Government	Yes	Policy document shaping the nature of the P2FC (commitment to address socio-cultural factors)
Responsible Actions: A Plan for Alberta's Oil Sands	GoA (Edmonton)	February 2009	No	No	Yes - Government	Yes	Identified as relevant by the SWQMFLAR; describes government priorities
Athabasca River Water Management Framework: Alberta's Regulatory Backstop to protect the Athabasca River	GoA (Alberta Environment in Edmonton) with Fisheries and Oceans Canada as a Contributor	January 2007	No	No	Yes - Government	Yes	A guidance document for developing water policy
Regional Sustainable Development Strategy for the Athabasca Oil Sands Area	Alberta Environment	July 1, 1999	No	No	Yes - Government	Yes	Foundational document for CEMA's instream flow needs objectives and scope; identified as relevant by the SWQMFLAR

Announcement: Alberta strengthens environmental protections in the oil sands (press conference media release and audio file of Minister Fawcett's remarks on the SWQMFLAR)	GoA (Environment and Sustainable Resource Development in Edmonton)	March 13, 2015	No	No	Yes - Government	Yes	Direct expression of the purpose and role of the SWQMFLAR
Lower Athabasca Region: Surface Water Quantity Management Framework for the Lower Athabasca River (SWQMFLAR)	GoA (Environment and Sustainable Resource Development in Edmonton)	March 13, 2015 (press conference) February 2015 (document finalized)	No	No	Yes - Government	Yes	Primary policy document signalling the end of the decision phase on river navigability and ANF
Submission to Joint Review Panel for Shell Jackpine environmental assessment: Written Evidence Containing Expert/Specialist Information and Knowledge of Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada and Transport Canada	Joint federal departments	October 2012	No	No	Yes - Government	Yes	Directly addressed government perspectives on impact of water withdrawals on river navigability
Lower Athabasca Regional Plan 2012 - 2022	GoA (Land Use Secretariat in Edmonton)	Order in Council Approved August 22, 2012; Press release on August 24, 2012	No	No	Yes - Government	Yes	SWQMFLAR is a framework under the Lower Athabasca Regional Plan
Letter to Pat Marriott, Senior Water Advisor, Alberta Energy Regulator: Completion of CEMA research on the Athabasca River prior to the issuing of any further water withdrawal licences	ACFN (Lisa King) and MCFN (Melody Lepine)	February 12, 2015	No	No	Yes - Community	Yes	Describes perspectives on government reactions to ANF
Final Report on Athabasca River Instream Flow Needs Scoping Study	Golder Associates Ltd. for CEMA (at the time, the provincial partners were Alberta Environment and Alberta Sustainable Resource Development)	April 2004	No	No	Yes - Both	Yes	instream flow needs scope determination
CEMA Instream Flow Needs Determination Workshop – Athabasca River, May 3-4, 2005 in Fort McMurray, Alberta, Canada (summary notes)	Dr. Thomas B. Hardy & Carri Richards of Watershed Systems Group INC.	May 2005	No	No	Yes - Both	Yes	instream flow needs scope determination
Instream Flow Needs Screening Study – Delta Region, Lower Athabasca River Literature Review and TEK Collection Final Report	Dillon Consulting Limited for CEMA	September 2007	No	No	Yes - Both	Yes	instream flow needs scope determination
Lower Athabasca River Phase II Water Management Framework Process Guidelines	Dan Ohlson, Compass Resource Management	January 2008	No	No	Yes - Both	Yes	Guided the P2FC scope and objective
Phase 2 Framework Committee Report (and technical appendices)	Dan Ohlson, Graham Long, Compass Resource Management & Todd Hatfield, Solander Ecological Research	January 2010	No	No	Yes - Both	Yes	Primary document shaping water withdrawal rules for the SWQMFLAR

Licence to Divert and Use Water, Interim Licence 07921 issued to Syncrude Canada Ltd.	Alberta Environment pursuant to the Water Resources Act	1986	No	No	Yes - Both	Yes	Rules are a factor in the Implementing Innovation Framework
Licence to Divert and Use Water, Interim Licence 10400 issued to Suncor Inc.	Alberta Environment pursuant to the Water Resources Act	1987	No	No	Yes - Both	Yes	Rules are a factor in the Implementing Innovation Framework
Monitoring Recommendations for the Phase 2 Water Management System	Todd Hatfield, Solander Ecological Research Ltd. and Dan Ohlson, Compass Resource Management Ltd for CEMA's Surface Water Working Group & Monitoring Technical Task Group	Completed September 27, 2011 and sent to the regulators (GoA and DFO) for implementation in November, 2011	No	No	Yes - Both	Yes	Identified river navigability as a knowledge gap
Estimating Effects of Water Withdrawals from the Lower Athabasca River: IFNTTG Final Report	Prepared for Cumulative Environmental Management Association Surface Water Working Group Edited by William G. Franzin IFNTTG Technical Program Manager / Laughing Water Arts & Science, Inc. With assistance from members of the IFNTTG	December 18, 2009	No	No	Yes - Both	Yes	Shaped opinions on the necessity of river navigability protections
Adaptive Management Recommendations for the Phase 2 Water Management Framework	Todd Hatfield, Solander Ecological Research Ltd. and Dan Ohlson, Compass Resource Management Ltd. for CEMA's Monitoring Technical Task Group, Surface Water Working Group	December 2010	No	No	Yes - Both	Yes	Primary document shaping water withdrawal rules for the SWQMFLAR
Report of the Joint Review Panel EUB Decision 2004-009: Shell Canada Limited, Applications for an Oil Sands Mine, Bitumen Extraction Plant, Cogeneration Plant, and Water Pipeline in the Fort McMurray Area	Alberta Energy and Utilities Board and the Government of Canada	February 5, 2004	No	No	Yes - Both	Yes	Importance of instream flow needs addressed and shaped instream flow needs determination timelines
Traditional Environmental Knowledge Research Guidelines	Jeremy Smith for the TEK Standing Committee of CEMA	January 12, 2006	No	No	Yes - Both	Yes	Seeking TK (motivation) and learning how to use TK in decision-making
Independent Strategic and Program Evaluation of the Cumulative Environmental Management Association	Integrated Environments with Tumbleweed Consulting for Athabasca Tribal Council and the GoA	January 26, 2008	No	No	Yes - Both	Yes	Explores Indigenous peoples' concerns about CEMA's governance structure and makes recommendation on how to more meaningfully involve

							them in decision-making.
Report of the Joint Review Panel EUB Decision 2004-005: Canadian Natural Resources Limited, Application for an Oil Sands Mine, Bitumen Extraction Plant, and Bitumen Upgrading Plant in the Fort McMurray Area	Alberta Energy and Utilities Board and the Government of Canada	January 27, 2004	No	No	Yes - Both	Yes	Importance of instream flow needs addressed and shaped instream flow needs determination timelines
Final Report on the Lower Athabasca River Instream Flow Needs Monitoring Workshop, Calgary, Alberta, March 27-28, 2007	Josh Korman and Carl Walters of Ecometric Research Inc. Prepared for Instream Flow Needs Technical Task Group, CEMA	July 5, 2007	No	No	Yes - Both	Yes	Although this report focussed on technical issues, it did discuss the temporal and geographic scope of the instream flow needs determination
Report of the Joint Review Panel, Decision 2013 ABAER 011: Shell Canada Energy, Jackpine Mine Expansion Project, Application to Amend Approval 9756, Fort McMurray Area (CEAA Reference No. 59540)	Joint Review Panel Established by the Federal Minister of the Environment and the Energy Resources Conservation Board	July 9, 2013	No	No	Yes - Both	Yes	Did not include in Research Question 1a and 1b because does not come directly from MCFN and ACFN; Included in Research Question 2 because it summarizes government perspectives on river navigability and ANF
Surface Water Quantity Management Framework for the Lower Athabasca River: Draft for discussion purposes	Alberta Environment and Sustainable Resource Development	June 13, 2014	No	No	Yes - Both	Yes	Demonstrates perspectives on the need for river navigability-related provisions in the SWQMFLAR
Water Act licence No. 186921-00-00 issued to Canadian Natural Resources Ltd to divert water from the Athabasca River for the Horizon Project	Alberta Energy Regulator	Last renewal occurred on August 5, 2015	No	No	Yes - Both	Yes	Rules are a factor in the Implementing Innovation Framework
Water Act licence No. 00071821-01-00 issued to Canadian Natural Resources Ltd (Formerly Shell Canada Limited and before that Albian Sands Energy Inc) to divert water from the Athabasca River for the Muskeg Project	Alberta Energy Regulator	Last renewal occurred on May 30, 2017	No	No	Yes - Both	Yes	Rules are a factor in the Implementing Innovation Framework
Review of Water Management Alternatives on Water Depth in the Lower Athabasca River	AECOM Canada Ltd. For CEMA's Socio-Economic Task Group	October 2009	No	No	Yes - Both	Yes	Shaped opinions on the necessity of river navigability protections
Water Act licence No. 00186157-00-00 issued to Shell Canada Limited to	Alberta Energy Regulator	Renewal date of June 23, 2004	No	No	Yes - Both	Yes	Rules are a factor in the Implementing

divert water from the Athabasca River for the Albian Muskeg Project							Innovation Framework
CEMA Communications Audit Revised Report	Brand Insights Group	September 4, 2002	No	No	Yes - Both	Yes	Provided root issues leading to MCFN and ACFN withdrawing from CEMA and preparing ANF outside of the collaborative
Qualitative and Quantitative Socio – Economic Data Scoping Analysis - Final Report	Gardner Pinfold for CEMA	September 2008	No	No	Yes - Both	Yes	Shaped opinions on the necessity of river navigability protections
CEMA In-stream Flow Needs Meso-Habitat Metric Determination Workshop – Athabasca River	Dr. Thomas B. Hardy & Carri Richards of Watershed Systems Group INC.	December 2005	Not applicable	Not applicable	Not applicable	No	Focussed on technical issues. Provided background information on applicable legislation and policies
An Evaluation of the Applicable Environmental Management Options for the Athabasca Oil Sands Area Phase I: An Update of the Technical Support Document for the Regional Sustainable Development Strategy (Appendix 2) and a Review of Industry Environmental Management Options	PriceWaterhouseCoopers for CEMA – Sustainable Ecosystems Working Group	April 4, 2003	Not applicable	Not applicable	Not applicable	No	Provided background information on applicable legislation and policies
Historical Trails Research Project Wood Buffalo Regional Municipality	Gabriella Prager of Points West Heritage Consulting Ltd. With support from ISL Group Ltd. for CEMA' s Sustainable Ecosystems Working Group	August 27, 2004	Not applicable	Not applicable	Not applicable	No	Focussed on historical trails used by fur traders and explorers rather that Indigenous routes; not endorsed by MCFN, ACFN or the FCM
Surface Oil Sands Water Management Summary Report	Michael E. Rogers, Alberta Technology and Science Inc. (Syncrude Canada Ltd. and P.J. Whalen and Associates Ltd. provided process flow diagrams and photographs) Prepared for CEMA's Surface Water Working Group, Water Management Systems Task Group	December 7, 2006	Not applicable	Not applicable	Not applicable	No	Provided background information on water usage
A Compilation of Information and Data on Water Supply and Demand in the Lower Athabasca River Reach	Golder Associates Ltd. for CEMA SWWG	May 2005	Not applicable	Not applicable	Not applicable	No	Provided background information on water usage

Letter to Bob Dunn, CNRL: Athabasca River Water Levels (request to cease water withdrawals and provide daily water withdrawal rates for 2015). This is one of a series of similar letters sent to all oil sands mining companies in response to low water levels in the Lower Athabasca River that were impacting their ability to exercise treaty rights.	Letter from ACFN Industry Relations Corporation (Lisa King)	September 1, 2015	Not applicable	Not applicable	Not applicable	No	References the ABF and AXF and the inadequacy of the SWQMFLAR but did not analyze because dated after SWQMFLAR release
Traditional Use Mapping of the Lower Athabasca River: Phase 2 Study	WRG Westland Resource Group Inc. for CEMA's Socio-Economic Task Group	2009	Not applicable	Not applicable	Not applicable	No	Not available - special permission needed that I did not receive due to the dissolution of CEMA.

STATUTES			
Statute	**Jurisdiction**	**Role in data collection**	**Rationale for inclusion**
Alberta Environmental Protection and Enhancement Act	Provincial	Reviewed	Identified as relevant by SWQMFLAR but only reviewed because does not address instream flow needs, water conservation objectives, base flows directly. It also does not apply as directly as the *Water Act* or ALSA.
Alberta Land Stewardship Act	Provincial	Analyzed	Identified as relevant by SWQMFLAR because it was classified as a Framework under the Lower Athabasca Regional Plan
Canada National Parks Act (2000)	Federal	Reviewed	The Wood Buffalo National Park extends across the downstream portions of the lower Athabasca River and Delta, and so Parks Canada was identified as a stakeholder in the instream flow needs work. Under section 8(2) of this statute, Parks Canada's role in the instream flow needs work was to provide information and recommendations for the maintenance or restoration of the ecological integrity of the park. Although Park Canada's role in the instream flow needs work is provided for by this statute, this statute was reviewed rather than analyzed because it did not guide the GoA's adoption of ANF.
Canada Water Act	Federal	Reviewed	Reviewed to understand federal water responsibilities, and although relevant from a holistic approach to water management, it did not drive the decision-making around the instream flow needs, water conservation objectives or river navigability protections.
Canadian Environmental Assessment Act	Federal	Reviewed	Reviewed the purpose of the Act, and although relevant from a holistic approach to water management, it did not drive the decision-making around the instream flow needs, water conservation objectives or river navigability protections.
Canadian Environmental Protection Act	Federal	Reviewed	Reviewed the purpose of the Act, and although relevant from a holistic approach to water management, it did not drive the decision-making around the instream flow needs, water conservation objectives or river navigability protections.
Fisheries (Alberta) Act	Provincial	Reviewed	Fisheries were an important part of the instream flow needs discussion and relate to ANF because the First Nations want to preserve their access to fish as an important country food. However, the *Fisheries (Alberta) Act* was not analyzed because it focuses on the management of fisheries as a resource (e.g., fishing licenses, inspections, invasive species management) rather than providing guidance on the topics core to this research (e.g., surface water quantity management, treaty rights, collaborative adaptive management, policy innovation, river navigability, the development of environmental management plans, meaningfully using TK in decision-making).
Fisheries Act	Federal	Reviewed	Reviewed the purpose of the Act. While the protection of fish and fish habitat were important components of the instream flow needs work and the federal government has fiduciary responsibilities to ensure treaty rights are respected, the Fisheries Act was not analyzed as part of this research because it

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			does not relate to the topics core to this research (e.g., surface water quantity management, treaty rights, collaborative adaptive management, policy innovation, river navigability, the development of environmental management plans, meaningfully using TK in decision-making).
Navigation Protection Act (the version in force in 2010)	Federal	Analyzed	Analyzed because river navigability for the purposes of exercising Aboriginal and Treaty rights is the core concern of ANF.
Water Act	Provincial	Analyzed	Identified as relevant by SWQMFLAR; the primary provincial statute pertaining to surface water quantity management and instream flow needs

APPENDIX F: EXAMPLES OF CASE-BASED FIELD MEMOS AND CONCEPTUAL MEMOS

Excerpt from a Case-based Field Memo
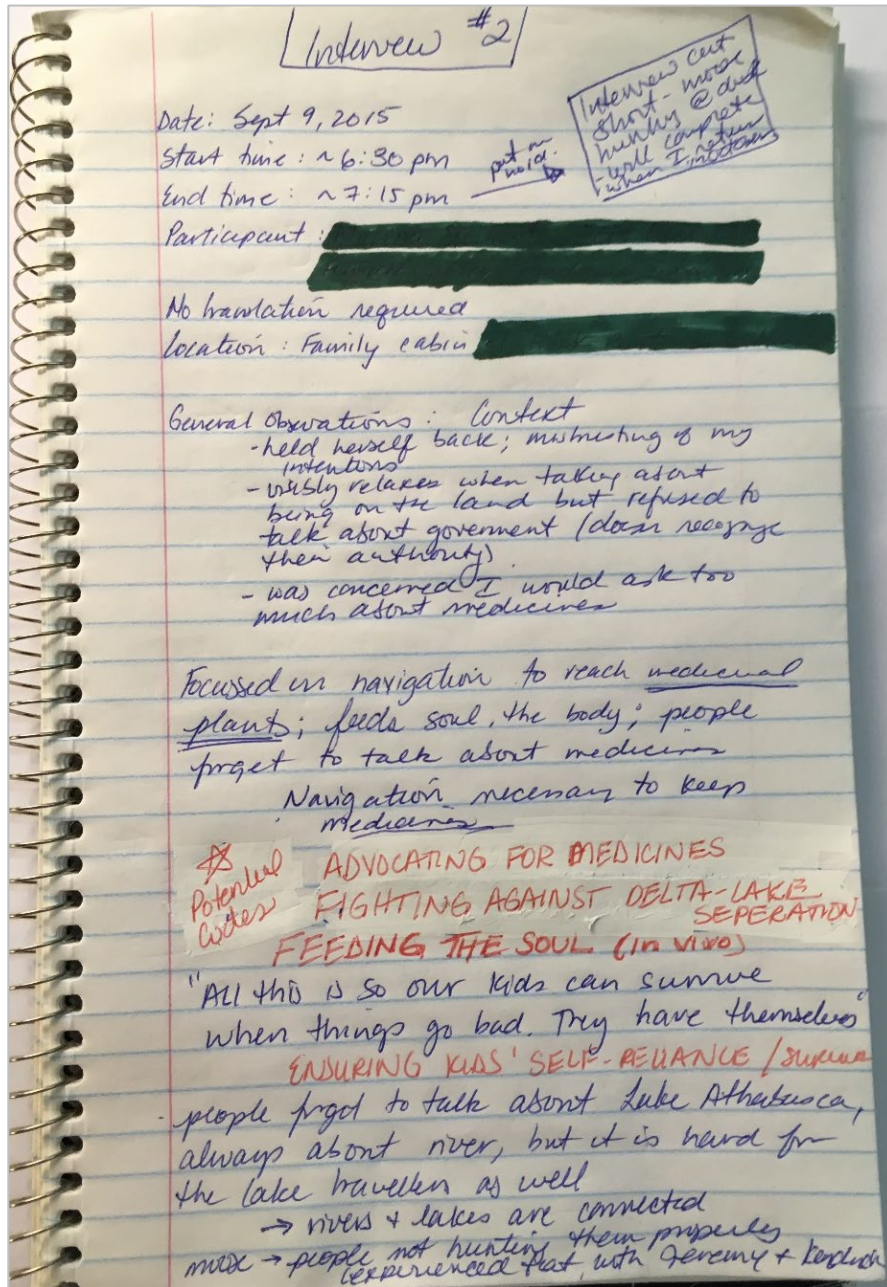
Example of a Conceptual Memo

(Note: this represents an evolution of thought and does not represent a finding based on the completed analysis)

Journal Entry 24: Needlessly self-marginalizing

NEEDLESSLY SELF-MARGINALIZING is the provincial government's standpoint that MCFN and ACFN prematurely withdrew their membership from CEMA. The First Nations' withdrawal from CEMA was considered needless because their participation was valued and CEMA members wanted to hear their input. The interviewee also opined that the First Nations should have recognized the efforts of AESRD, DFO and CEMA to establish a more meaningful, equitable, constructive, and focussed process to better integrate diverse voices on a set timeline (the P2FC process). Versions of "they should have at least tried it before giving up" were frequently heard. Self-marginalizing here means the First Nations' isolationist behaviours; they separated themselves from the collaborative even though significant efforts had been made to address their concerns by both levels of government. GP15 described how "Alberta and Canada worked together with First Nations to see what was needed to have them participate directly in that process. Fort McKay was willing and actively participated. Mikisew and ACFN decided not to participate in that process." Fort McKay First Nation's involvement was emphasized in tone of voice and repeated mentions: (i) their participation was given weight due to their closer proximity to the oil sands (Fort Chipewyan is further downstream); and (ii) they were willing to work through the damaged relationships while MCFN and ACFN were not. The frustration shown towards MCFN and ACFN translated into resentment and then the delegitimization of their input (DELEGITIMIZING THEIR POSITION).

Interestingly, government participants without hesitation acknowledge the damaged relationships amongst CEMA members but blamed MCFN and ACFN for leaving). At the same time provincial government participants identified themselves as victims because they were forced to choose between MCFN and ACFN and the First Nations that continued as P2FC members (BUILDING RELATIONSHIPS AT THE EXPENSE OF OTHERS). Also, the provincial government had to expend tremendous effort to keep MCFN and ACFN informed through a parallel consultation process because the First Nations chose to leave CEMA. At the same time, the engagement efforts at this time appeared to be bitter with the parallel consultation with MCFN and ACFN reduced to information sharing. Potential code: BITTERLY ENGAGING. Need to inquire more about the nature of this parallel process and how the provincial government saw their role vis-à-vis MCFN and ACFN during the P2FC.
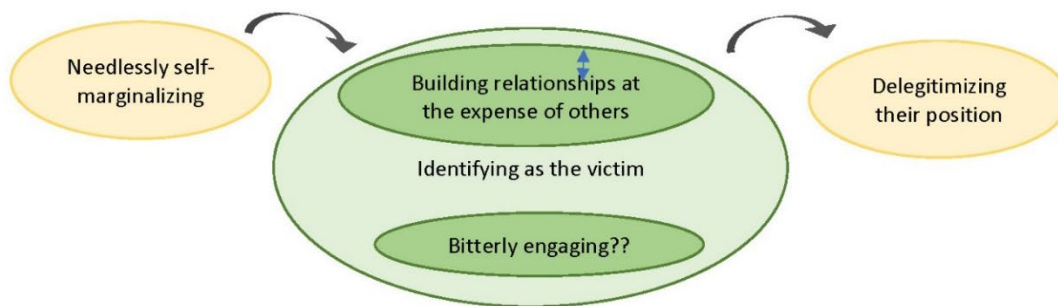
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Community Participants' Narrative

Government Participants' Narrative

Early focusing event: Expecting rapidly expanding oil sands developments to intensify competition for water

Early motivation: Individuals being concerned about river ecosystem (fish) protection in face of greater development pressures

Later motivation: Proactively taking action to preserve long term regional water use goals

- Possessing clear regional goals established through public consultation
- Recognizing need for long-term, future oriented management plans
- Individuals recognizing the incompleteness of regional environmental knowledge and water usage data
- Recognizing changing legal and social expectations
- Recognizing Indigenous connections to the land
- Recognizing declining river flow trends
- Knowing it was time to depart from past policy approaches
- Confronting need to include Indigenous knowledge and experience in policy

Later motivation: "Modernizing" policy by directly addressing Indigenous perspectives

Gaining time through organizational restructuring and policy integration

Maintaining participatory norms
- Re-embracing participatory decison-making policies
- Educating new staff
- **Harmonizing with existing process commitments**

Enabling Indigenous participation
- Actioning participatory provisions in legislation
- Setting informal and legally-binding Indigenous engagement policies

Water Act provisions for water conservation objectives allowed introduction of base flows into conversation

Assisting position development by resource sharing
- Providing funding for studies
- Sharing data

Leveraging internal staff talents and capacities for action
- Appreciating efforts of Indigenous peoples
- Maintaining established relationships
- Possessing abilities that support change (Being creative, willing, open-minded)
- Strong inter-organizational communications prompting action
- Leveraging highly regarded internal technical expertise
- Leveraging in-house Indigenous relations expertise

Initiating action from clear and persistent communication

Establishing rapport with peoples
- Executives engaging directly shows respect
- Engaging bilaterally fosters open dialogue
- Engaging iteratively builds mutual understanding
- Engaging on location deepens connections
- Taking the time and having stable staffing to build relationships

Well-defined inter-organizational communication channels

Hearing clear and persistent communications
- Indigenous peoples refusing to be ignored
- Indigenous peoples being consistent, well organized and persistent
- Being receptive to diverse perspectives

Receiving well-articulated and detailed positions (P2FC; ANF)

Motivating individual action

Motivating organizational action

Using science-based translators advances positions
- Bridging technical experts facilitate deeper understanding
- Using western science-trained experts helps improve commensurability

Using facilitators broadens outcome acceptance
- Achieving timelier outcomes
- Diverse people feeling heard to find common ground
- Fostering equitable participation
- Dislodging entrenched positions
- Creating a hard evidence base

Leveraging (Alberta) Water Act recreation provisions to fill regulatory gap

Overcoming perceptions blocking Indigenous Knowledge usage
- Questioning established perceptions of experiential knowledge
- Reframing thinking about experiential knowledge
- Learning the value of experiential knowledge
- Being proud of how Indigenous Knowledge was used

Enhancing social acceptance of oil sands industry
- Adjusting to meet social expectations
- Meeting legal requirements
- Enhancing framework credibility
- Building confidence in oil sands regulation
- Enhancing oil sands reputation

Integrating competing values without losing site of desired outcomes
- Seeing industry and downstream Indigenous peoples as most directly affected
- **Integrating diverse needs within bounds of regional context**
- Needing to meet community needs within bounds of natural flows
- Needing to make decisions within context of regional goals
- Integrating values based on priorities is subjective
- Seeing balance defined differently by different peoples
- Asserting government's role as integrating a broad range of often competing interests
- Dealing with uncertainty
- Needing mechanisms to assess conditions over time
- Striving for reasonableness rather than consensus

Addressing complexity by redefining problem scope
- Dealing with imperfect information
- Dealing with complexity (climate change; hydrology; competing interests)
- Needing to deliver timely decisions
- Narrowing geographic scope
- Selectively applying regulatory tools
- Upholding existing/approved oil sands water access

Resisting regulatory sea change for existing oil sands projects

Avoiding disproportionate regulation to be fair
- Consistently rejecting base flow conceptions
- Avoiding abstraction cessation for existing/approved projects
- Establishing restrictive operational requirements for new developments
- Acknowledging compromises of existing companies
- Avoiding lost oil sands functionality
- Valuing oil sands economic contributions

Having different views internally on the link between human health and water quantity management

Seeing internal differences of opinion on appropriate geographic scope of water management unit

Avoiding collaborative settlement of rights issues
- Blocking rights-related conversations
- Preferring court settlement of rights-based questions

Information access constraining comprehension
- Misperceptions distorting beliefs about management effectiveness
- Needing specialist expertise to understand
- Explaining technical information is difficult
- **Incompletely transmitting information to entire communities**
- Relaying information through key community contacts
- Lacking mechanism to directly communicate with everyone

Being uncertain about proportional contributions to navigation problems
- Dredging and Peace River dammming confounds water withdrawal impacts
- Multiple hydrologic influences
- Withdrawing water minimally impacting flows
- Questioning validity of submitted experiential data
- Maintaining navigability is a knowledge gap
- Questioning correlation ("incremental impact") between water withdrawals and navigability

Seeing a range of opinions on whether water withdrawals authorized by senior licences may be changed to accomodate a base flow

Upholding First-in-Time, First-in-Right Principle

Needing to establish measuring congruence for defensible decison-making

Diagnosing Measuring Disparities

Finding incommensurability
- Failing empirical data fit check
- Assessing incremental impacts to navigation not possible
- Needing a measuring origin of zero

Modifying into statistical modelling approach
- Prioritizing hard data over experiential evidence
- Maintaining hard data management approach
- Equating defensible decison-making to hard data use

Self-marginalizing from effective collaboration
- Resisting attempts to repair relationships
- Paralleling positional debates
- Disagreeing that group processes dilutes voices
- Respecting work of collaboration

Seeing unresolved technical arguments
- Differing measuring origins
- Being unclear about interactions between alternatives
- Seeing oversimplification of hydrologic influences (climate change; dredging)
- Establishing lower order communications

Demanding single interest selection

Forcing relationship hierarchy
- Inflexibly positioning prescription
- Undermining collaborating parties
- Building relationships at expense of others
- Excluding other regional Indigenous peoples

- Increasing choice-making uncertainty
- Limiting decision defensability
- Limiting decision transparency

Delegitimizing position through extra-collaborative participation

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