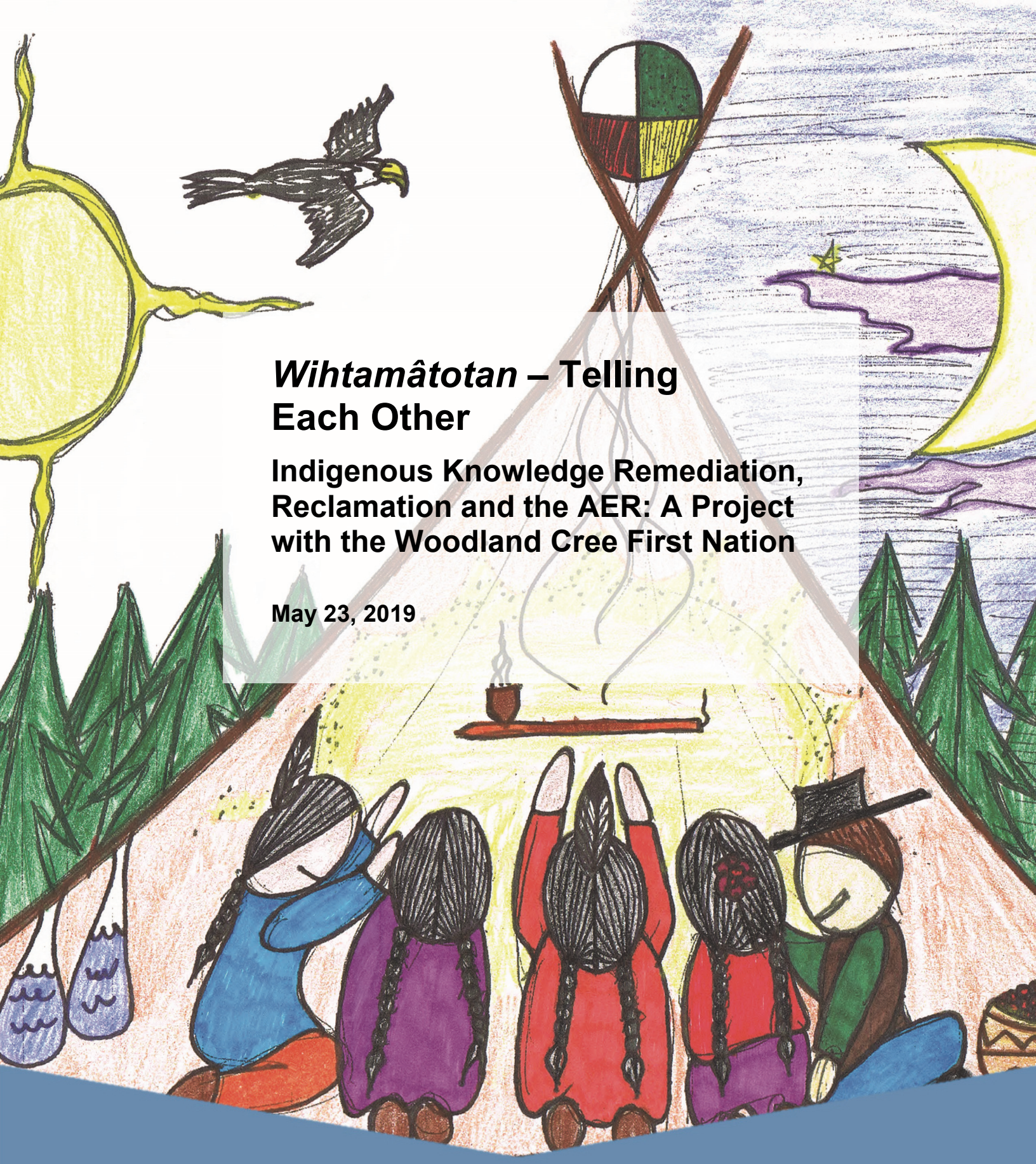

Wihtamâtotan – Telling Each Other

Indigenous Knowledge Remediation, Reclamation and the AER: A Project with the Woodland Cree First Nation

May 23, 2019

Alberta Energy Regulator

The cover art was designed by Lawrence Lamouche, traditional lands manager with Woodland Cree First Nation.

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Preface

The AER's work with the Woodland Cree First Nation is a part of our journey toward regulatory excellence and is inspired by the United Nations Declaration on the Rights of Indigenous People.[1] It is part of an overall awakening of the organization to the positive contribution that varying perspectives, worldviews, and knowledge systems, along with a multiple evidence base approach, can make to the regulation of upstream energy development in Alberta.

This report presents the activities and findings from our work with the Woodland Cree First Nation. It is written to introduce AER staff and leadership to indigenous traditional knowledge in a practical manner that ties to an operational reference point. The report also serves as a foundational document upon which the AER can build its understanding of indigenous knowledge. It is the hope within the AER that this body of research and the teachings of the Woodland Cree elders will contribute to more awareness of the opportunities and challenges presented by a shift in thinking and in the AER's approach to indigenous traditional knowledge and its potential space within the AER's regulatory processes.

While not a regulatory guide or directive, this report presents a view into the perspectives that the AER is seeking to understand in order to inform the delivery of its mandate, as it relates to remediation and reclamation. As with *Voices of Understanding: Looking through the Window*, it is an opportunity to see and understand things in a different way, from a different worldview.

It was an honour to work so closely with the Woodland Cree First Nation and elders. We recognize that our experience in this arena is with one nation, and we have much more to learn from the variety of indigenous experience that exists in Alberta. The AER does not presume that this project is an end point. It is, in fact, a beginning.

[1] The Government of Alberta has committed to the principles of the UN Declaration on the Rights of Indigenous People; however the Government of Alberta has yet to develop a cabinet approved policy in support of the declaration and its implementation.

Executive Summary

The AER is actively seeking to renew and improve its credibility and relationship with indigenous peoples. Activities that will help create this renewed relationship include exploring how the organization can build internal awareness of indigenous worldviews, acknowledging that decision-making mechanisms (parallel to those of the regulator) exist within indigenous communities, and engaging empathically to create an ethical space in our work with indigenous communities. For the AER, understanding how indigenous knowledge (IK) systems function in time and space will help the organization advance its strategic objectives, and deliver on commitments to recognize IK as a contributor to evidence-based decision making. Building more understanding and awareness that translates into action will also help the AER prepare for implementation of any provincial and federal policy or legislative changes which may arise if the *United Nations Declaration on the Rights of Indigenous Peoples* is adopted by the federal and provincial governments and subsequent policy is created.

Indigenous knowledge is a knowledge system and worldview that comes from the lived history and experiences of indigenous people. The Woodland Cree First Nation (WCFN, the nation, or the community) is concerned that the AER does not understand its use of the land and therefore cannot make fully informed decisions about site remediation and reclamation. As a result of their growing concerns about several releases on traditional territory, the nation expressed an interest in working with the AER to engage in joint learning on issues and experiences related to remediation and reclamation of specified lands, and to learn more about the AER's processes.

WCFN identified land remediation and reclamation as the critical activity in energy development that will ensure its members are able to practise their traditional lifestyle and exercise their treaty and aboriginal rights within their traditional territory into the future. Remediation and reclamation may occur throughout the life cycle of an operation as well as when operations have ended and a site is in the process of being closed. The AER applies risk rankings in order to prioritize audits on contaminated oil and gas sites. Audits may include desktop or field audits in which samples are gathered or a site is physically observed to determine compliance with legislation, standards, criteria, and guidelines.

With a focus on collaboration, empathic engagement, authentic relationship building, and a community participatory research approach, the AER field team and WCFN project team (a group of WCFN elders selected by the Nation to participate in the study with the AER) explored issues related to remediation, reclamation, traditional land use, and indigenous culture, worldview, and history. The community identified specific issues to which they wish to contribute their knowledge, perspective, and worldview, to ensure their interests are being looked after. The AER created a space for this to occur by emphasizing the complementary nature of our respective knowledge systems and taking a multiple evidence base approach to assessing the knowledge shared in the process.

The WCFN Project Team stressed the importance of acknowledging issues around trust, meaningful communication, community involvement, risk perceptions and assessments, community and

environmental health, and environmental change. There are misalignments between how this community and the western worldview relate to the land and resources.

The fieldwork documented a number of critical findings which highlighted that there must be an understanding of the intersection between energy development and traditional land use and indigenous lifestyle in order to develop appropriate actions to mitigate impacts. To access this community knowledge, trust must be understood as a prerequisite for sharing IK. There is a long history of misuse and misinterpretation of IK, and when this occurs it can quickly erode trust and can potentially harm the community.

Trust is also affected by communication styles in technical reports and misaligned expectations for remediation and reclamation standards. Community-based monitoring is proposed by WCFN as a process for fostering a closer working relationship with the AER. The community also proposes creating a space for indigenous voices in AER processes. Engaging indigenous peoples in the auditing of environmental standards as well as in risk assessment can help build AER knowledge of how people assess their environment, and it can inform the perception of risk among community members.

A literature review completed for this project examined eight projects in Western Canada where IK was included in reclamation and remediation activities carried out by industry. The primary rationale for industry to choose this approach were varied, but underlying all was the premise that the business decision to include IK supported corporate objectives, including expediting the closure process (fewer complaints) and leveraging the knowledge and skill sets of local communities. Common strategies for success in these projects included leveraging existing relationships to build trust through open communication, by focussing on increasing the community's capacity to participate in remediation and reclamation activities, and by including elders and youth. Common challenges resulted from a lack of focus on these same successes, with capacity being the greatest challenge.

A focus group study with Driftpile First Nation (DFN) was undertaken in order obtain a basis for comparing the perspectives of another First Nation regarding concerns with reclamation and remediation and the potential for IK to inform the same. Both DFN and WCFN demonstrate a high level of concern about the potential health impacts of consuming water, plants and animals from contaminated sites. However, DFN demonstrated a unique caveat to their perception of risk in that if scientific monitoring provided evidence that their members were not being exposed to contaminants, they would be less concerned about health impacts in those areas. Similarities exist between both communities regarding their recommendations with respect to community involvement. Community members participating in spill response activities, involvement in remediation and reclamation planning, and monitoring the environmental outcomes of reclaimed or remediated sites are viewed as a pathway for IK and impacts to traditional land use to be understood and considered.

For the braiding of IK and western science into regulatory decision making to occur, there must be space in the system for indigenous voices to be heard and for their information to enter the system in its own form. For this to happen, the AER will need to develop a deeper understanding of the links between the regulatory system and an indigenous worldview and system.

"Our connection to the land is life. This is the big thing that needs to come out of the research. Without the land we start shrivelling as a people, we become unhealthy… from the land comes our identity, our livelihood, our culture."

WCFN elder

Introduction

In 2015 the Woodland Cree First Nation (WCFN) met with the Alberta Energy Regulator (AER) to outline concerns about the perceived long-lasting negative impacts of energy sector spills and releases that have occurred on WCFN traditional territory. In this meeting, WCFN members expressed concern over their ability to safely use the land and resources as they always have, to practise their culture by engaging in their traditional lifestyle, and to ensure that their culture continues with subsequent generations.

WCFN members pointed to a number of historical spills and how they have been experienced by the community. They expressed concerns about the follow-up actions of the companies responsible, about the sharing of information and data that were difficult to interpret or find meaning, and about poor consideration of impacts on indigenous lifestyle and traditional land users and on their personal safety in an area after it is reclaimed.

WCFN members were concerned that the AER did not understand their use of the land and therefore, could not make fully informed decisions about site remediation and reclamation. As a result, WCFN members expressed interest in working with the AER to explore how IK could be applied to remediation and reclamation processes and requirements in order to address their concerns and to support the work of the AER.

The AER is actively seeking to renew and improve its relationship with indigenous peoples by exploring how the AER can build awareness of indigenous worldviews; acknowledge that decision-making mechanisms, parallel to those of regulators, exist within indigenous communities; and create an ethical space in its work with communities. Working with WCFN was an opportunity for the AER to understand, in a practical sense, what the links are between AER regulatory processes and the knowledge of traditional land users. In 2016, an interdisciplinary team from the AER (the AER field team) specializing in social sciences, indigenous history, culture, lifestyle and traditional land use (TLU), remediation and reclamation, and toxicology, began working with a team of elders from WCFN (the WCFN project team) to explore reclamation, remediation, and IK.

This document reports on the findings from this work with WCFN, captures recommendations from the community, and provides considerations for the AER to reflect on as it proceeds on this journey of developing a more in-

Project Purpose
The purpose of the project is to engage in a collaborative joint-learning process that identifies opportunities, challenges, constraints, and tactical means by which western resource management and indigenous knowledge (IK) systems can be braided and integrated in the regulatory framework.

Project Objectives
The objectives of this project are as follows:

- Begin an exploration of WCFN's traditional lifestyle and land use activities and the application of IK in reclamation and remediation concerns, issues, requirements, and processes.
- Participate in joint-learning opportunities to increase WCFN's capacity for and knowledge of reclamation and remediation and to increase the AER's knowledge of IK and traditional land use.

Ethical Space

"The 'ethical space' is formed when two societies, with disparate world views, are poised to engage each other. It is the thought about diverse societies and the space in between them that contributes to the development of a framework for dialogue between human communities. The ethical space of engagement proposes a framework as a way of examining the diversity and positioning of Indigenous peoples and Western society in the pursuit of a relevant discussion…"(Ermine, 2007, pp. 193-194)

"When we work to understand a perspective that is different from our own, and then examine that understanding with an eye to finding connections with our own perspective, or our own worldview, we begin to create ethical space. The key is to link these worldviews in a way that does not diminish either, and that honours both. This new way, which reflects a deep understanding of varying perspectives and values, can result in an ethical space that transforms the way we work together." (Alberta Energy Regulator, 2017, p. xvi)

depth organizational knowledge of indigenous communities, realizing the parallel decision-making processes we share and how we can improve our relationships by moving toward an ethical space for dialogue.

Global and Provincial Context

The AER's exploration of the braiding of IK in the AER processes, specifically reclamation and remediation, takes place within an international context that began in the 1940s and continues today. During this time the value, role, and importance of IK was recognized in parallel with the recognition of the rights of indigenous peoples, both nationally and internationally (Zappalaglio, 2013).

Beginning in 1945, the *United Nations Charter* recognized human rights and sovereignty. In 1948, the *United Nations Universal Declaration of Human Rights* recognized the dignity and equality of all people. In 1975, the Tsheshaht Band in Port Alberni, British Columbia, hosted a conference of 260 world indigenous leaders. At this conference the World Council of Indigenous Peoples was established, eventually leading to official recognition of indigenous rights at the United Nations level. This recognition was "essential in order to acknowledge the existence of an extensive corpus of knowledge… belonging to Indigenous communities…" (Zappalaglio, 2013, p. 4).

In 1989, the International Labour Organization (ILO)[2] adopted the *Convention Concerning Indigenous and Tribal Peoples in Independent Countries* (ILO Convention NO. 169). This convention recognizes the "aspirations of these peoples to exercise control over their own institutions, way of life and economic development and to maintain and develop their identities, languages, and religions, within the framework of the States in which they live..." (International Labour Organization, 1989). While not mentioning IK explicitly, the convention does address aspects of IK, including the necessity of the subsistence economy, traditional activities and handicrafts, and community-based industries for the maintenance of culture and self-reliance; and it emphasizes the importance of traditional resources and the role of indigenous peoples in their management.

[2] An international organization created by the Treaty of Versailles and affiliated with the League of Nations. In 1946 the ILO became a special agency of the United Nations.

When the Convention on Biological Diversity was signed in 1992, it broke new ground. For the first time, there was recognition that indigenous communities are depositories and repositories of a body of knowledge that manifests itself through traditional lifestyle and that this information can be important in the management of the environment and resources. This was also the first time the term "traditional knowledge" was used in an international agreement. The Convention on Biological Diversity was very influential, and many subsequent conventions have referred directly and indirectly to IK.[3]

The United Nations General Assembly adopted the *Declaration on the Rights of Indigenous Peoples* in September 2007 to enshrine the rights that "constitute the minimum standards for the survival, dignity, and well-being of the Indigenous peoples of the world." Many articles of the declaration address IK, including article 31(1), which says the following:

> Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions. (United Nations, 2008).

In 2015, the Canadian federal and Alberta provincial governments made policy commitments to renew their relationships with indigenous people through the process of reconciliation. These commitments include implementing the calls to action in *Truth and Reconciliation Commission of Canada: Calls to Action* (Truth and Reconciliation Commission of Canada, 2012) as well as introducing legislation. In December 2017, Bill C262, the *United Nations Declaration on the Rights of Indigenous Peoples Act*, which has yet to receive royal ascent, was introduced to the Parliament of Canada for its second reading as a private member's bill. The purpose of the act is to ensure that the laws of Canada are in harmony with the *United Nations Declaration on the Rights of Indigenous Peoples*. These documents are influencing how some Canadian organizations and all levels of government in various jurisdictions are assessing or renewing the state of their relationships with indigenous peoples.

In 2016, the Government of Canada completed a review of National Energy Board (NEB) and Canadian Environmental Assessment Agency (CEAA) processes in order to modernize these organizations. In 2018, the *Impact Assessment Act* was introduced as a proposed replacement for the existing *Canadian Environmental Assessment Act* (2012). This change would result in a new regime for the assessment of impacts caused by federally regulated projects. Central to conducting impact assessments under this new regime is an assessment of a project's impact on indigenous groups or on the rights of indigenous peoples, an inclusion of indigenous traditional knowledge, and other considerations related to indigenous cultures.[4]

[3] The *United Nations Convention to Combat Desertification* (1994), the *International Treaty on Plant and Genetic Resources for Food and Agriculture* (2001), the *Convention for the Safeguarding of the Intangible Cultural Heritage* (2003).

[4] This piece of legislation has yet to receive royal ascent. As such the pending regulations are not yet developed. These regulations will be important for Provincial and Territorial governments in terms of understanding the Act's impact, and the subsequent impact on the AER.

As a regulatory body, the AER is responsible for ensuring that its decisions and regulatory requirements and processes are consistent with, and uphold the direction established in, Government of Alberta policy and legislation. In addition, the AER also plays a role in the larger system of land and resource management by supporting the identification and resolution of policy and regulatory gaps that might affect the ability of the system to successfully deliver on the social, economic and environmental policy outcomes.

The Alberta Model for Regulatory Excellence (Alberta Energy Regulator, 2016) identifies utmost integrity, empathic engagement, and stellar competence as key principles for advancing regulatory excellence. Within the principle of utmost integrity, the AER has identified that we consider IK as a contributor to evidence-based decision making (Alberta Energy Regulator, 2016).

Voices of Understanding: Looking through the Window (Alberta Energy Regulator, 2017) marks a step in the AER's journey to regulatory excellence as it prompts the organization to genuinely reflect on the processes and systems that guide the way it does its work and what that would look like when framed in the window of indigenous worldviews. The AER's vision is to be a regulator that is protective, effective, efficient, and credible. The perception of the AER's credibility among indigenous communities largely depends on the state of the relationship we establish together and on the extent to which they can see themselves, their points of view, their concerns, their knowledge, and the information they provide to the AER reflected in the AER's actions and decisions.

The work detailed in this report is continuing along the path laid down in international conventions and is demonstrating responsiveness to public demands for modern, participatory, and transparent regulators who make evidence based decisions. Just as the awareness of parallel knowledge systems and ethical space revealed within *Voices of Understanding* has created an opportunity to transform how the AER engages with indigenous people, this project contributes to informing how indigenous worldviews can be taken into consideration within regulatory decision making.

The Woodland Cree First Nation

Woodland Cree First Nation (WCFN) is a Cree-speaking nation of approximately 1200 individuals whose traditional territory is in Treaty 8 territory over an area surrounding Cadotte Lake (Figure 1). Culturally, WCFN is made up of a combination of *Dene-zaa* (Beaver), *Muskego* (Swampy Cree), and Woodland Cree peoples. WCFN was recognized as a First Nation on August 28, 1989. The nation officially claimed settlements on August 20, 1991, and has three reserves within the boundaries of Treaty 8: Marten Lake, Cadotte Lake, and Golden Lake (Woodland Cree First Nation, 2015). Of the nation's current membership, about 750 people live on the reserve. The nation completed its adhesion to Treaty 8 on September 24, 1991.

WCFN is a part of the *Kee Tas Kee Now* tribal council, which includes Loon River Cree Nation, Whitefish Lake First Nation (Atikameg), Lubicon Lake Band, and Peerless Trout First Nation. WCFN has a mixed economy. Most members are employed doing wage-earning labour, full- or part-time, in the resource economies, while still engaging in a bush or subsistence economy through hunting, gathering,

and trapping activities. The band continues to use traditional resources, such as moose, wolf, ducks, swans, greyling, berries, and medicinal plants, for subsistence and cultural purposes.

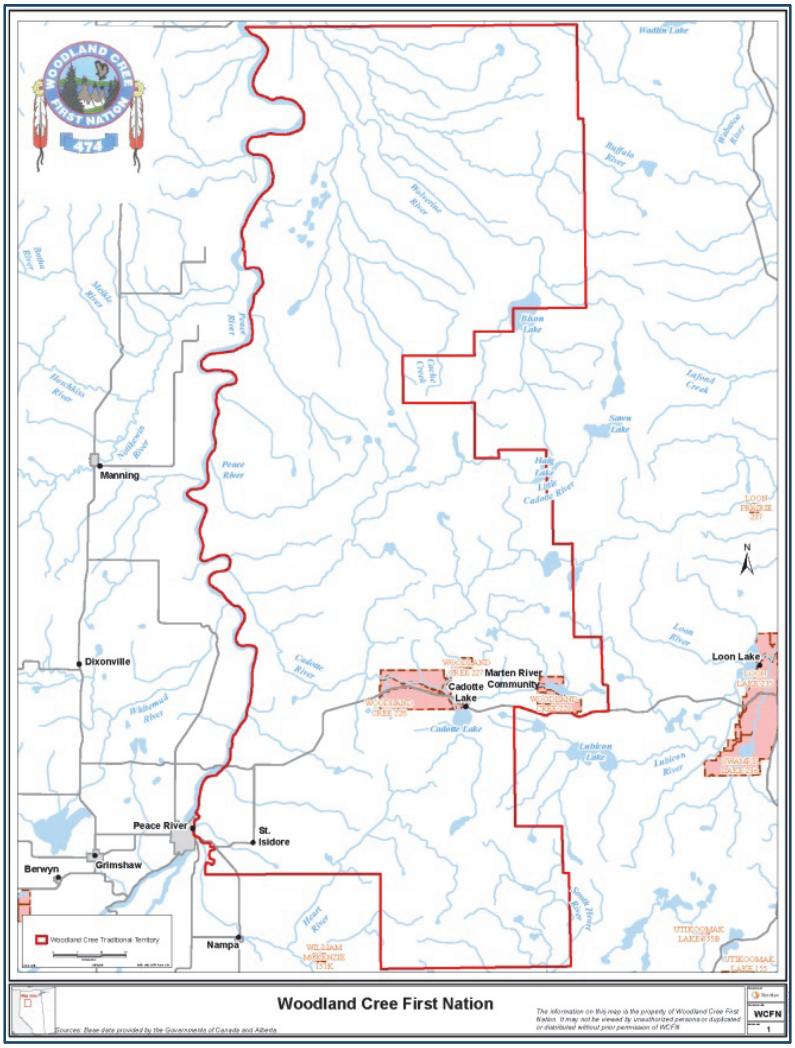

Figure 1. WCFN current traditional land use area and consultation boundary (supplied).

Study Approach

This project is grounded in a qualitative social science approach and methodology. While the overall question, and the purpose of the research, is to address how the AER can begin to braid and integrate IK and the regulatory process, specifically in reclamation and remediation, there is no attempt to test a specific hypothesis. Instead, the approach focuses on proactively understanding social phenomena through observation, communication with participants, and the thematic analysis of qualitative data. It stresses the importance of context, in this case understanding how WCFN members experience oil and gas development and regulation through their lifestyles and traditional land use. It relies on qualitative information—descriptions of experiences, stories, opinions, and anecdotes—expressed as a narrative or as a set of conclusions. The proactive approach to looking at social phenomena emphasizes understanding

the human element and human experience in the discussion of remediation, reclamation, and energy development. The basic research process is illustrated in Figure 2.

Figure 2. Research process

Collaboration

As people affected by energy development activities demand more input into the processes that affect them, the AER is exploring different ways of engaging with stakeholders and rights holders. In the work with WCFN, the decision was to move to a more collaborative and participatory approach. A collaborative process involves collectively identifying priorities, linking diverse perspectives, and developing shared solutions to complex issues (Ball, Rebori, & Singletary, 1999). Collaboration involved community-based participatory research techniques, joint learning, connecting knowledge systems in a multiple evidence base approach, and a commitment to developing authentic relationships.

The AER field team and WCFN focused on collaborating on the research direction, design, implementation, and analysis. The AER did not approach the community seeking answers to specific questions, nor was a research hypothesis developed in isolation. Instead, the approach was to work collaboratively to create a shared understanding of the overall context and purpose of our discussions, to listen actively and understand concerns, and to identify and address information gaps along the way. One outcome of this project is an understanding of the importance of collaboration to promote outcomes that are positive for both the AER and WCFN.

Community-Based Participatory Research

The research approach used in the current project is grounded in the overall philosophy and intent of community-based participatory research (CBPR). CBPR is a family of ethical and methodological tools that enable local people to share, enhance, and analyze their knowledge of life and conditions (Chambers, 1994, p. 953). It stresses the importance of local knowledge and "enlists those who are most affected by a community issue – typically in collaboration or partnership with others who have research skills – to conduct research on and analyze that issue, with the goal of devising strategies to resolve it." (Rabinowitz, 2017). The effect of this approach is that participants are invested in both the process and the outcomes and feel ownership of the results.

In indigenous communities, the perspectives and local knowledge of participants are considered in the CBPR approach in order to collaboratively design research that the study community will relate to and to develop research questions that stem from a community-identified problem or a need for information (Marullo and Strand, 2004; Israel, Schulz, Parker & Becker, 1998). CBPR is an appropriate methodological framework for the present research, as it incorporates several perspectives and includes different ways of seeing the world (Fletcher, 2003). It recognizes IK systems as valid on their own epistemological foundations and views them as contributing to a larger understanding of the world and of the place of humans in it (Fletcher, 2003).

Multiple Evidence Base Approach—Connecting Knowledge Systems

This research is inspired by the multiple evidence base approach (MEB) to braiding knowledge systems. Specifically, MEB:

> proposes parallels whereby indigenous, local and scientific knowledge systems are viewed to generate different manifestations of knowledge, which can generate new insights and innovations through complementarities. MEB emphasizes that evaluation of knowledge occurs primarily within rather than across knowledge systems. MEB on a particular issue creates an enriched picture of understanding, for triangulation and joint assessment of knowledge, and a starting point for further knowledge generation. (Tengo, Brondizio, Elmqvist, Malmer, & Spierenburg, 2014, p. 579)

Parallel approaches in MEB emphasize the complementary nature of knowledge systems while not presupposing a dominant knowledge system.

Braiding Knowledge Systems

The term *braiding* is used to emphasize that when we look at different ways of knowing, we are recognizing and appreciating each of them as legitimate forms of knowledge, each with merit and validation in its own right. There is no one dominant knowledge system.

Connecting western scientific knowledge and IK through MEB can result in better information at a local scale, and it can broaden the temporal context of scientific data (Gagnon & Berteaux, 2009). Usher (2000) argues that "traditional knowledge can contribute to a fuller understanding of local environmental processes at a finer and more detailed geographical scale than conventional scientific knowledge can offer" (p. 187). IK and western scientific knowledge, when braided, result in a resource management system that is better informed and suited to the resources, to the people who rely on those resources, and to the needs of scientists and land managers (Nuttall, 2000; Usher, 2000). MEB can empower communities, enhance plans, procedures, and decision making, and identify effective mitigations specific to traditional land use activities. This has the side effect of ensuring that indigenous peoples, with differing worldviews, can see their knowledge, values, and interests considered and applied in an external governance and management system that before seemed foreign to them.

Joint Learning

Community capacity building refers to strengthening the skills and abilities of people and communities so they can overcome obstacles and meet goals (Ball, Rebori, & Singletary, 1999). For the work of the AER and WCFN, it was recognized early on that capacity building must occur within both WCFN and the AER. WCFN lacks specific knowledge of the AER, its roles and responsibilities, and the larger energy regulatory system. The AER lacks organizational knowledge of how indigenous communities are using and occupying the land and resources and exercising their rights; and of how oil and gas development and regulation intersect these activities.

Joint learning is the primary approach used to build capacity. The AER provided information from a regulatory perspective, with a focus on remediation and reclamation processes, while WCFN members shared their way of life, their experiences with regulatory processes, and the impacts of energy development activities felt by their communities. The result is learning from one another in a two-way flow of information, both parties playing the role of teacher and student. This role reversal encourages a respectful flow of information that helps to build effective relationships and braid and integrate knowledge systems.

The Importance of Relationships

Relationship is an indigenous value that has a role in the regulatory process; it forms the foundation for how people understand their place in the family, society, and cosmos. The Cree concept of *Wahkotiwin* provides deeper meaning about how those relationships should look. Relationships are sacred and are provided intentionally by the Creator. These relationships interconnect all things, humans, animals, plants, the land. Principles and teachings are in place to ensure that relationships are appropriate and positive. When relationships are healthy, they protect those in the relationship. Relationships need to be renewed and restored in order for decision making to be considered meaningful. Relationships helped build champions for this work and developed the trust needed to share sensitive information and personal experiences.

Building authentic relationships with indigenous communities through empathic engagement is an aspiration of the AER as we strive for regulatory excellence. In this research, relationships were developed through active listening, respect, honesty, transparency, knowledge sharing, and actions. Acting on what WCFN members were speaking about was key, as was engaging in open and honest conversations about the concerns, experiences, and issues they raised. The result is respect, as illustrated in the following comment from an elder. We asked the elder "who do you trust with regard to information about the health of the land?" The response:

> "The people here, I trust them. I don't think you would lie to me."

Having a consistent team made up of diverse subject-matter experts on site to act on what they were saying, respond to questions and provide information was invaluable in developing a trusting relationship. The challenge is to move from the individual trust built through the process to an institutional trust.

Empathic Engagement
For the AER, empathic engagement means working together so that we can make fully informed decisions and build strong relationships. We are straightforward about the issues, and we listen carefully, respond respectfully, and ensure that our decisions are understood. We know that to build and maintain relationships we must be fair, inclusive, and transparent.

The Principles of Empathic Engagement
Respectful engagement—Building strong relationships is crucial to the work we do. For us, engagement is a priority for each employee and must be reflected in every interaction with Albertans, indigenous peoples, and stakeholders. This means listening to truly understand values and concerns, and it means sharing information about our work, not just when there is a particular project or decision to consider, but on a regular basis.

Decisions are understood—As a regulator, we know we must, at times, make difficult decisions. Regardless of the result, we will demonstrate how all factors were considered in our decision making, and we will ensure that our decisions and the processes we followed are understood.

Transparent—We will be open and transparent in our communications, finding new ways to provide information to Albertans that is clear, timely, and easy to understand.

Indigenous Knowledge

The AER field team spent three days on the land with the WCFN project team camping, exploring sites, listening to stories, and eating traditional food. In those three days and in discussions before and after, the elders would talk about life when they were younger and life now; the changes they have witnessed, both good and bad; and their desires for the future for themselves, their families, and their community. In all of these discussions were detailed observations of the world around them and a sense of their place and of their relationship to the land and resources. They spoke about their family and community histories, their travels by foot, horse, and wagon through their traditional territory, and the principles and teachings for living their traditional indigenous life: life as *Nehiyawak,* as Cree people. Elders showed us different plants, taught us their Cree names, and described their traditional use and preparation. We were encouraged to give thanks for the berries and plants we harvested around the campsite through an offering of tobacco. Likewise, the quest for information required an offering of tobacco to the elder. We were taught that this offering and acceptance fulfills an important relationship to the land from which we harvested, and it fulfills the proper protocol for transferring the elder's knowledge to another individual.

This, at its most basic, is IK. It is the knowledge, way of life, and worldview of indigenous peoples that is inherent in their history, lifestyle, and cultural practices. The WCFN elders stressed that IK is how they, their parents, and their grandparents lived; it is how they see the world, who they are as a people, as *Nehiyawak*, and is inherent in them. IK has many pseudonyms: indigenous traditional knowledge, traditional ecological knowledge, traditional knowledge, and aboriginal knowledge, among others. No universal definition of IK exists, and there is much debate over its definition. Fikret Berkes (2012, p. 7) defines it as

> …a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.

The United Nations Educational, Scientific and Cultural Organization (1999) defines IK as follows:

> The Indigenous people of the world possess an immense knowledge of their environments, based on centuries of living close to nature. Living in and from the richness and variety of complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them that is particular and often detailed. In rural communities in developing countries, locally occurring species are relied on for many - sometimes all - foods, medicines, fuel, building materials and other products. Equally, people's knowledge and perceptions of the environment, and their relationships with it, are often important elements of cultural identity.

The Traditional Knowledge Working Group of the Northwest Territories (Legat, 1991) developed the following definition:

> Knowledge that derives from, or is rooted in the traditional way of life of Aboriginal people. Traditional knowledge is the accumulated knowledge and understanding of the human place in relation to the universe. This encompasses spiritual relationships, relationships with the natural environment and the use of natural

> resources, relationships between people; and, is reflected in language, social organization, values, institutions, and laws.

Essentially, IK is about what you know, how you have come to know (the process), and how you conduct yourself, and the values, ethics, and underlying belief system that guide your behaviour. It is complex. Its comparison to the understanding of knowledge and information in a western scientific sense tends to diminish IK's complexity and depth.

For IK, the context in which it is created is essential. It is place-based and has developed over many generations of observation. When reaching a site, it was clear who among the elders holds authority in an area. They had the authority to speak, while others referenced them and their family as having the history and knowledge in the area. IK is a way of knowing that is based on the unique and specific relationship of indigenous people to the world around them. It is thus personal, permanent, transitory, and communal. It grows and evolves with the experiences of the people.

Western academics recognize the multifaceted nature of IK. Houde (2007) describes six interrelated components of IK:

1. Observations of the environment, classifications, and system dynamics

This is knowledge focused on observing conditions, trends and variations in the environment, especially extremes, rather than establishing norms and averages. The rational, factual, descriptive information about the environment is generated through repeated, empirical observations. It is verified, refuted, or improved by oral history and by the stories and experiences of other IK holders (Usher, 2000).

2. Environmental management systems

Indigenous knowledge holders have established environmental management systems to sustainably manage resource use (Houde, 2007). The systems are often informal and consider factors such as location, timing, quantity, and quality of the harvest. Although most indigenous communities in Canada no longer live fully subsistent lifestyles, harvestable resources still feature prominently in their diets, lifestyles, and cultures, so management systems are maintained (Nelson, Natcher, & Hickey, 2005).

3. Factual knowledge about past and current uses of the environment

Through personal experience, IK holders know how the land was used traditionally, and they continue to practise on individually and communally known geographic locations. While the term "traditional" suggests a foundation based on historical observations, past experiences, and oral histories, indigenous peoples' IK is not frozen in the past but is an accumulation of adaptive responses that evolve over time and are still evolving (Berkes F. , 2012). As a system of knowledge, it is cumulative, adaptive, and dynamic.

4. Environmental ethics and values

This component of IK covers the underlying ethics and values of knowledge holders. Usher (2000) described these ethics and values as "culturally based value statements about how things should be, and

what is fitting and proper to do, including moral or ethical statements about how to behave with respect to animals and the environment, and about human health and well-being in a holistic sense."

5. Traditional ecological knowledge as cultural identity

The cultural identities of knowledge holders are deeply rooted in the connections of knowledge holders to the land (Houde, 2007). Knowledge holders know that the land has sustained them and that the health of the land and environment is integral to a healthy future. The land is where knowledge and culture are generated and passed on to peers and to younger community members. If the land is degraded, opportunities to practise culture and lifestyle and to pass on traditional knowledge are fewer, so their culture diminishes in response (Houde, 2007).

6. Cosmology

Culturally based cosmology is the foundation of IK. It refers to the assumptions and beliefs about how the universe works, the way in which things are connected, and the role of humans in the world. This cosmology guides relationships and interactions between people and between people and the natural world (Houde 2007; Neis et al. 1999; Nickels 1999). The relationship between knowledge holders and the land is interactional rather than transactional. This means the land is viewed as having intrinsic value rather than instrumental value.

WCFN members, like other indigenous peoples, are keepers of the land; an impact on the land and resources will have an impact on the people. This interconnection is an essential aspect of WCFN world view. Keeping this relationship in balance through laws, morals, and ethics provides the people with a healthy and balanced living. As one WCFN elder said,

> "Our connection to the land is life. This is the big thing that needs to come out of the research. Without the land we start shrivelling as a people, we become unhealthy… from the land comes our identity, our livelihood, our culture."

Remediation and Reclamation

Under *Environmental Protection and Enhancement Act* (*EPEA*) and the *Conservation and Reclamation Regulation* (*CRR*), operators are legally obligated to return specified land to a state of equivalent land capability. The AER is responsible for ensuring these activities take place in accordance with the legislation and policy, including applicable standards, criteria and guidelines. Remediation and reclamation are considered throughout the life cycle of energy development and may occur throughout (i.e., by progressive reclamation) the life of an operation, or at the end. These are the activities that the WCFN project team view as critical to ensuring that they are able to practise their traditional lifestyle and exercise their treaty and aboriginal rights into the future.

Remediation

Soil, surface water, and groundwater can become contaminated when substances used or produced in energy development are released to the environment (i.e., air, land, and water). If a release occurs, energy companies must manage any contamination from their licensed activities or approved facilities. This process is called remediation. Potential contamination and remediation is considered throughout a project's life cycle, from application to project closure. Releases of substances can be of short or long duration. When a substance that might cause, is causing, or has caused an adverse effect[5] is released into the environment, the person who released, or that caused or permitted the release, must report the release to the AER immediately upon discovery. The person responsible must take all reasonable measures to remediate, manage, remove, or otherwise dispose of the substance in a manner that will prevent further adverse effects.

The AER has the authority under the legislation it administers to take enforcement action against parties persons responsible that fail to manage contamination, particularly if the contamination damages the environment or impairs public safety.

When a new or historical release is discovered, the AER works with the person(s) responsible to ensure that the contamination is appropriately managed. This includes minimizing risks by ensuring that accessible contamination is contained and controlled and residual contamination is managed through an appropriate risk management plan.

The Government of Alberta's *Contaminated Sites Policy Framework* sets out requirements for the management of contaminated sites, and applies when developing and assessing options for the management of contaminated lands in the province. The framework is designed with the intent of

[5] Adverse effect is defined in the *Environmental Protection and Enhancement Act*, section 1(b), as "impairment of or damage to the environment, human health, or safety or property." Adverse effect may be determined by any number of factors, including the chemical and physical characteristics of the substance released, the receiving media, the location of the release, and the risk to the environment. The onus is on the person who causes, permits, or has control of the release to determine whether there is a potential adverse effect.

achieving the following policy outcomes: pollution prevention, health protection, and ensuring productive use of the land. It sets out the following principles of contaminant management:

- Containing and controlling the source of the contamination
- Conducting an environmental site assessment to delineate the extent of contamination (horizontally and vertically)
- Assessing risk to ensure that receptors are not adversely affected at any point during remediation
- Considering factors other than risk
- Managing the contamination, and remediating in a timely manner

The AER uses a risk-ranking process to prioritize its audit of contaminated oil and gas sites for contamination management. Risks that are considered include the probability of contamination resulting from an activity; the area of Alberta in which the activity occurs; and what and who could be affected by the contamination. Consideration of these risks helps define the receptors, the exposure pathways, and the requirements for monitoring and remediating contamination on specified lands in Alberta.

Developing a conceptual site model (CSM) is an important step for managing contamination. A CSM is a visual representation and narrative description of the physical, chemical, and biological processes that are a result of contamination at a site. CSMs are developed by industry proponents to outline the site-specific conditions that are relevant to contaminant management for a specific site and to identify contamination sources, pathways, and receptors. A robust CSM defines

- what contamination is present and where,
- the current state of the contaminant,
- where the contaminants will migrate to,
- the pathways of transport/migration,
- the receptors in the system,
- the level of exposure of those receptors, and
- acceptable exposure limits.

Once a CSM is developed for a site, it is used to inform the decision-making process and to develop a remedial action plan that will most effectively ensure the protection of human health and the environment. The *Contaminated Sites Policy Framework* uses contaminant management strategies, including exposure control and remediation, to meet contaminant limits based on the specific contaminant and on the environment in which it exists, in accordance with the *Alberta Tier 1 and Tier 2 Soil and Groundwater Remediation Guidelines* and *Environmental Quality Guidelines for Alberta Surface Waters*.

Specific land-use categories and exposure pathways are attempts to capture the broad spectrum of activities, receptors, and exposure levels that might occur within a given area. This information is used to define the land-use-specific risks to receptors, and the possible exposure pathways, and is used to develop guidelines for sites that fall into each category. The land uses currently classified in Alberta are natural areas, agricultural, residential/parkland, commercial, and industrial land uses. Through effective management, the *Contaminated Sites Policy Framework* is an attempt to ensure, through proper management, that contaminated sites are returned to a productive end land use that protects human and ecological health.

Reclamation

Reclamation is defined in *EPEA* and the associated *Conservation and Reclamation Regulation* to mean any or all of the following:

- Removing equipment or buildings and other structures
- Decontaminating buildings, other structures, land, or water
- Stabilizing, contouring, maintaining, conditioning, or reconstructing the surface of the land to a state of "equivalent land capability" as it is defined in *EPEA* and the CRR.

Under current legislation, an operator is required to reclaim specified land to a state of equivalent land capability and apply for a reclamation certificate from the AER. This means that the operator (including the holder of a licence, approval, or permit issued by the AER for purposes related to the carrying on of an activity on specified land) must reclaim the land to equivalent land capability so that it can support various land uses after reclamation, similar to the capability it had before development on the land, although individual land uses will not necessarily be identical.

As with remediation, specific standards, guidelines, and criteria exist for the reclamation of specified lands. Among the documents that define the reclamation criteria for well sites and associated facilities are the *2010 Reclamation Criteria for Well Sites and Associated Facilities for Cultivated Lands*, the *2010 Reclamation Criteria for Well Sites and Associated Facilities for Forested lands*, the *2010 Reclamation Criteria for Well Sites and Associated Facilities for Native Grasslands*, and the *2016 Reclamation Criteria for Well Sites and Associated Facilities for Peatlands.* The criteria evaluate whether a site meets equivalent land capability based on an assessment of the landscape, vegetation, and soils. Once a company feels it has met the criteria for its site as laid out in the guiding documents, the company may apply to the AER for a reclamation certificate. The time it takes to complete the reclamation can vary; regardless, the AER must be satisfied that all requirements have been met before certifying a site as reclaimed.

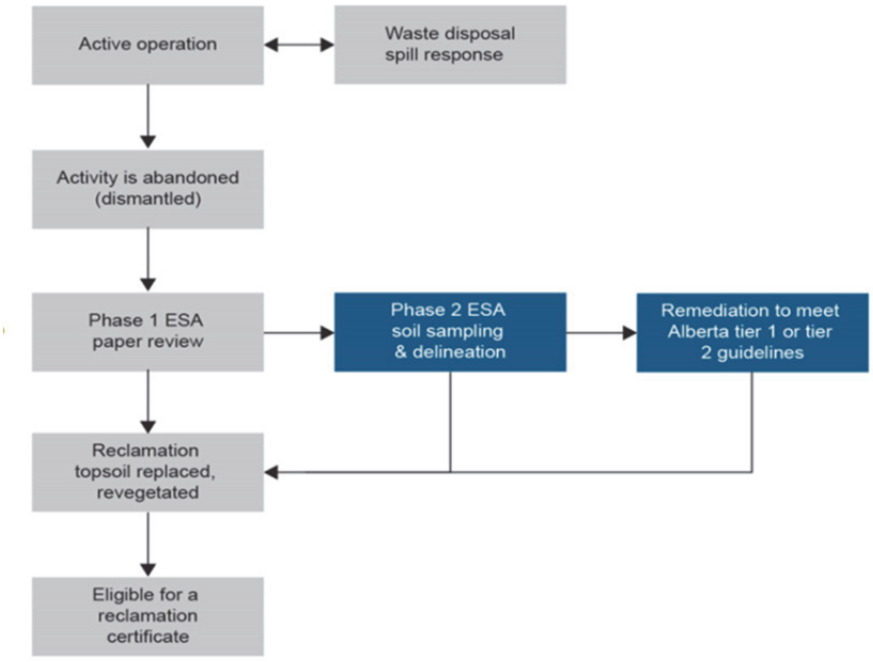

Figure 3. The reclamation process for energy sector sites.

Environmental Assurance Following Certification[6]

The AER conducts audits of certified sites to verify compliance with legislation, standards, criteria, guidelines, and policy. Audits are separate from the compliance process. Sites either are randomly selected for audit or are targeted for audit based on risk. Audit types include the following:

Desktop audit—This audit is to ensure that the correct information was available to support reclamation certification. Any risk factors identified may result in a more comprehensive desktop audit. This can include a review of the phase 1 environmental site assessment (ESA), the phase 2 ESA, the phase 3 ESA, or the detailed site assessment. Based on the findings of the desktop audit, a certified site may be recommended for a surface or subsurface field audit.

Surface reclamation field audit—This type of audit includes a file review and a site visit to assess whether a site is compliant with the criteria. The assessment includes vegetation quality and quantity, soil quality and quantity, site topography and landscape, evidence of remaining facilities, visual indicators of contamination, and any other parameters identified by the landowner or flagged by the desktop audit or in a statement of concern.

[6] Since the writing of this report, Specified Enactment Direction 002 *Application Submission Requirements and Guidance for Reclamation Certificates for Well Site and Associated Facilities* was updated. It can be found here: https://www.aer.ca/documents/manuals/Direction_002.pdf.

Subsurface contamination field audit—This type of audit includes a file review and a site visit to collect soil samples for lab analyses. At some sites, an electromagnetic survey and groundwater sampling may also be included.

Certificates may be upheld or cancelled at any audit step. Reasons for cancellation include: the application was incomplete, was inaccurate, or contained inconsistent information; the site was not assessed for contamination where required; or the site was not compliant with remediation guidelines or reclamation criteria and no adequate justification was provided in the application.

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> "And documenting traditional knowledge is just the first step. Using it effectively alongside other sources of information, such as standard scientific studies, requires skill and experience: The challenge is similar to that of combining oceanographic, biological, economic, and anthropological studies to understand environmental and social impacts. Different forms of knowledge are collected in myriad ways from diverse sources, requiring practitioners to learn the terms and perspectives of other disciplines to create a cohesive whole. In such an effort, involving experts from each field only makes sense…"
>
> (Huntington, 2016)

Analysis of the information documented and knowledge gained through the fieldwork and interactions with the WCFN project team revealed a number of specific issues and themes brought forward by the elders related to remediation, reclamation, Woodland Cree roles and knowledge, and energy development in general. These were reviewed and verified by the WCFN project team. As a conclusion, one elder offered this:

> "There needs to be a focus on solutions for both traditional knowledge and western science. We need to find common ground. There can be logging and oil and gas, but it needs to be done in a respectful way."

This requires an understanding of how energy development and traditional land use, and occupancy and indigenous lifestyle intersect, and of the challenges this intersection creates. It requires taking appropriate actions based on this knowledge.

Trust, Meaningful Communication, Community Involvement, and Knowledge

For WCFN, trust means having respect for one another and showing this respect through transparency, involving the community in meaningful ways, and acting on their concerns and recommendations. Trust is a theme that emerged early in our discussions with WCFN elders, and it remained a consistent topic throughout the project. Trust is something the elders most often referred to for its absence in the regulatory process—i.e., a lack of trust. WCFN project team members expressed a lack of trust in a system that has left them negatively impacted; a lack of trust in regulations that do not account for traditional land use activities or for the lifestyles of indigenous peoples; and a lack of trust in industry and in its desire, ability, and impetus to adhere to regulations or "do the right thing" without constant regulatory oversight. The absence of trust negatively affects the AER's reputation and credibility within indigenous communities. Questions arise about the credibility of the AER's (in)actions and decisions.

The findings were similar to those of the 2016 study "Fair Enough: Assessing Community Confidence in Energy Authorities," which looked at public trust and confidence in energy authorities and determined that, "Many people do not trust institutions to 'do the right thing' and may have little confidence that those institutions would be competent to do so" (Cleland, Nourallah, & Fast, 2016, p. 11). Trust is, however, a critical condition of indigenous involvement in energy-related remediation and reclamation

processes, in the creation of ethical space, and in the application of IK to regulatory decision making (Powter, Doornbos, & Naeth, 2015).

Trust between WCFN, industry, and the AER (and the federal and provincial governments) requires three things: meaningful communication, community involvement, and the building of community capacity through knowledge. Elders said the following:

> "Right from the start to the end we'd like to be involved… good communication. If there's no communication, we're not going to know anything."

> "We need more involvement—we're not getting enough."

> "It would help for our community to get more involved with the oil companies so we don't just walk away and let things happen.We'd like to know more, have good communication."

Trusting relationships lead to more knowledge exchange (Dirks and Ferrin, 2001; Mayer et al., 1995). When trust levels are higher, people are more willing to provide useful knowledge and are more willing to actively listen (Andrews and Delahay, 2000, Mayer et al., 1995). Having a close working relationship does not equate to a trusting relationship. Trust must be earned, and it is earned through actions.

For WCFN, trust is a prerequisite for sharing IK. As a knowledge system that reflects the lifestyle, technologies, history, and spiritual beliefs of the people, communities are protective of IK and are not willing to share it if they do not trust that it will be used appropriately and ethically. Trust in a relationship enables all parties to participate meaningfully, to be vulnerable, and to contribute. Sharing IK places communities in a potentially vulnerable position where their knowledge, management systems, spiritual beliefs, and lifestyles are under the scrutiny of people who might not have a complete understanding. This can lead to misinterpretation and might harm the community, further increasing indigenous peoples' lack of trust.

Our team developed a trusting relationship, created pathways, and opened doors to exploring the application of IK in remediation, reclamation, and the larger oil and gas regulatory system. Many on the WCFN project team spoke of the great value—both practical and symbolic—in having the AER field team stay in the field and travel their traditional territory with the elders as guides. Being on the land and being open to experiencing and understanding the issues from their perspective were important for earning trust. A trusting relationship can create the pathways and open the doors to the application of IK to remediation, reclamation, and larger oil and gas regulation.

Concurrent attempts to build trust between the energy industry and indigenous communities are occurring in a space where negative stories about experiences with oil and gas companies are abundant. These stories and experiences create hurdles that the community, industry, and the AER need to jump over. For example, WCFN members highlighted how they often do not hear about releases on their traditional territories until either they or the community monitors come across them:

> "…they [the company] phoned me and told me there was an oil spill on my trapline… I didn't know it was right here until a week after… when someone reported it at the office."

> "We had one of our field monitors come out here. He used to go all over the place… I guess he came through here and saw the oil… I think the company already knew. And they didn't notify anybody, as usual. But our monitor, I guess there was already lots of seepage already... he reported it."

Meaningful communication is also a key part of building and maintaining trust. For WCFN, meaningful communication requires each party to have knowledge, to be open and honest, and to recognize and be responsive to the community. And most importantly, meaningful communication must involve action. It means sharing all information in a timely manner and ensuring that information addresses the issues raised by the community in a manner that is easily digestible.

> "We want to know what's happening, what's next?"

> "I like to know what's happening to our world. I like to see that… we're interested in what's going on…"

Communication that is not meaningful can have a detrimental effect on the overall relationship. In talking about his experience with one company about a spill in WCFN traditional territory, one elder noted that while things were going well for a while, they quickly turned.

> "They [industry] show us results and tests, but that doesn't mean anything…"

Technical reports, created primarily as a part of ESAs, can frustrate WCFN's lands staff and elders. While these reports may be technically robust, they do not address the concerns of the community. Most importantly, as WCFN notes, the reports do not answer the questions or address the issues of importance to the community such as: Are people safe to hunt, trap, or gather in an area? Is it healthy to consume fish or duck eggs, or to gather plants to make medicines? Will they be consuming harmful chemicals by consuming traditional resources? The intended audience for these ESA reports are the AER, industry, and industry's third-party consultants. The reports identify the contaminants of potential concern in an area, their concentrations, and provincial health and safety guidelines about them. The reports are not able to communicate to IK users that the land is safe to continue using for traditional purposes because IK and indigenous indicators of ecosystem health are not used to assess an area.

An elder noted the following when looking at a past spill site where the company had recently applied for a reclamation certificate:

> "What I see now, it's not much use now. There was beaver houses here before this happened [oil spill] …Before the spill I come here all the time…there was a lot of beavers in this area. There's nothing there now. I don't think it will ever change"

WCFN project team members also highlighted the number of times they receive conflicting information from different sources, which makes them question the validity and accurateness of the information being relayed by the company and whether it is following regulations. One elder spoke of a past spill on his

trapline. He said that while the company was officially telling him that the area was clean, he heard otherwise from industry employees and consultants working in the field:

> "I'm not so comfortable with that area yet. There's still some stuff [product] there, I was told. Even white people that were working that area, they used to tell me this job is not done. They know because they were working right here. I believe them…"

Much of the AER field team's time was spent listening to the WCFN project team talk about the challenges they faced in getting information about activities, impacts, monitoring, and potential risks. Experiences like these become a part of the oral history of an indigenous community and can further erode trust between the community and resource developers. Community members perceive a lack of respect for their rights as indigenous people and for their long history and knowledge of an area. They are unaware of the impact events such as releases have on their traditional lands, resources, and activities, and on their health and safety. This makes all future communication and activities less reliable in the eyes of the nation. Communities watch the remediation of sites stop and start.

In the case of WCFN, its project team members see the interconnection between all things and question whether the contamination has spread over time and how far it has spread. Once remediation is complete, communities often have unanswered questions about their ability to safely use the area for traditional resource harvesting and whether they can drink the water. Some WCFN elders noted that at historical spill sites, indicators that they look for in a healthy, productive area are conspicuously absent—indicators such as wildlife, noise, insects, and water levels high enough to produce flowing water:

> "What I see now, it's not much use now."

> "It used to flow… it's dammed but there's nothing in there now. No ducks. Used to have ducks there."

> "The old people told me there's some little red bugs that stay in the water. That's the water that's good to drink cause those things are life. Right now, you don't see no frogs, don't hear no frogs."

Without satisfactory answers to questions and concerns, trust cannot develop with the AER or industry. The credibility of the AER and the effectiveness of regulations are questioned. What are the effects on traditional land use activities, on health, and on safety? The elders said that they do not usually receive answers to questions like these. WCFN members also said they are unaware of the standards used in reclamation and remediation and have never been provided with this kind of information. The minimum communication a community or land user would receive included an indication that the reclamation or remediation work was complete, without providing any opportunity to include the standards of WCFN land users in these assessments. Comments from the elders:

> "A lot of oil companies come and start doing things without any consultation. Next thing we know it's already done. By the time our people go out there and check, they're already working on things. We did this! We communicate! A lot of the time it's not happening that way."

> "There's got to be an in-between person there—which is probably you guys—that can say—at least some good advice—say 'there are options and we want to know what the options might be.' Not just say 'oh yeah, we slapped a $250k fine on them' and said 'that's good to go.'"

WCFN project team members said that involving the community in remediation and reclamation is a positive way to build trust and transparency in industry and in the regulatory system. Their traditional role as keepers of the land means they consider themselves stewards and a part of the environment around them. Their involvement in energy development, and specifically in remediation and reclamation, is a means of fulfilling that role and of renewing and maintaining their relationship with the land. This is an important part of reconciliation. A *"healing"*, in WCFN terms, of the land by *"putting it back"* to its natural state is also an act of healing for indigenous people and their communities. People cannot be healthy if the land is not healthy. In the WCFN worldview, energy development activities are not healthy and have negative and long-lasting effects on environmental and human health.

> "There's been a lot of impact, negative impact. There's all these roads all over the place, power lines, pump jacks, pipelines and there's noise, dust. I don't come out here too often nowadays on account of all the activities. Because I'm not relaxed any more. I can't just go out and make my camp over here somewhere."

> "There's been a lot of change in the past ten years because there's lots of activities around surrounding the area… There's pump jacks all over, even in my trapline. Water is no good for us to drink, even if the creek is running... (Question: Why do you think the waters no good anymore?) Because there's too much activity—wells—that's why water's no good anymore. No matter which nation you go to—you'll hear the same story."

The involvement of WCFN members in reclamation and remediation was emphasized. By being involved, WCFN members could provide their IK, including their assessments, indicators, and concerns about current and past land use and occupancy, and about their desired future use. They expressed that their involvement might assure them that the land is in a state that meets traditional-use needs and standards after reclamation or remediation. This land provides for the practice of traditional culture and lifestyle and enables indigenous people to pass their culture on to future generations, and if the land is not useable, this practice is not possible and the continuity of the culture is questionable. Reconciliation promotes a space of shared and equally valued knowledge, premised on an acknowledgement of a relationship between indigenous communities and the land.

Involvement means that the community has a voice, and that questions and concerns will be appropriately and satisfactorily addressed. It might include being able to determine when a site has been properly remediated to traditional land use standards, to determine the indicators to use in an assessment, to develop guidelines for traditional lands, or to contribute to remediation and reclamation plans.

> "The thing is, just involve everybody that's affected, that's impacted. Get them all together as soon as something happens like this. Everybody has something to contribute, so if everybody threw in whatever their knowledge is, past experience, whatever, that would benefit everybody as a group."

> "When they do reclamation, we should get in there somewhere. We're not going to get in there and just be over their shoulder, but we'd like to be there—at the beginning of it and at the end, and somewhere in between. We'd like to know how it starts and how it finishes."

Communication and community involvement need to be meaningful in order to build trust and open an ethical space for knowledge exchange and the braiding of IK, western science, and resource management. These processes need to be ongoing and focused on actions and results. The elders want to see government, industry, and the regulator act to improve the system based on their community's concerns, for the community's involvement to be active, continual, and purposeful, and for the community's IK to be valued alongside western scientific knowledge in decision making. Building trust through positive actions increases the AER's credibility in the eyes of indigenous-rights holders.

Knowledge was a reoccurring issue raised by the WCFN project team. Few, if any, members possess a working knowledge of oil and gas development or the regulatory process, nor are they aware of their role in this process. *"*Why aren't we told about these things?*"* was a frequently asked question. Their desire is for more knowledge by being more involved in the processes.

To see things happening first hand and to be able to explore and understand the impacts provides valuable knowledge to community members, and it empowers them. When the idea of community-based monitoring was raised, they all recognized it as an opportunity to be involved—it is seen as a way of using their IK when selecting the indicators to monitor and when assessing the success of the reclamation from their perspective. The information documented and observed through community-based monitoring can answer some outstanding questions about impact and assures the community that its interests are being addressed.

Ongoing community-based monitoring is also seen as a process for creating a closer working relationship between the community and the AER. It is a way of creating a space for indigenous voices within the AER, and it can facilitate the critical self-reflection that is necessary in order to move toward an ethical space in which the two knowledge systems can work together. More discussion is necessary to explore what monitoring means to the community and within the AER context.

Risk Assessments, Risk Perception, Health, and a Changing Environment

Risk is something that WCFN members assess every time they are on the land picking berries, hunting, fishing, or camping, or while swimming in the lake. Immediate risks from oil and gas activities, such as a pipeline release, an explosion, or a gas release, that could negatively affect the land, resources, water, and air, could negatively impact the health and well-being of the people. Coupled with this are long-term risks associated with, for example, consuming water and traditional resources that might be contaminated. The distance from the land and waters to oil and gas activities is major factor for the WCFN in assessing risk.

For WCFN, IK is vital when assessing risk and is the lens through which members can safely assess, for example, whether water drawn from a particular water body will have any detrimental consequences. While oil and gas development is seen as a risk to the environment and to traditional land use activities and traditional land users, the risks associated with forestry activities are not viewed as negatively, especially in terms of contamination:

> "Once it was done it was cleaned up and everything—all the lumber—all the leftover lumber in the area. They cleaned everything out because forestry is really after them. They'll get after them if they're not cleaned—even in the camp area—they make them clean that stuff—environment. (So you feel more comfortable with sites that were previously used for forestry than for gas?) This is okay. I don't have no problem with this because it's not an oil and gas thing."

For WCFN, risk is assessed by the elders who are using indigenous indicators, traditional teachings, and wisdom, who are looking at how people use the land, and who know what resources are harvested and where. The history of oil and gas and other industrial development in the area and the perceived potential impacts on their health and safety are new considerations for the WCFN project team. This causes a high degree of stress and anxiety among the WCFN field team and the larger community:

> "We never had no concerns over that [oil spills]. Everything was free… peace. Now hardly anyone goes out now. There's too many activities wherever you go. In my trapline I just go to my cabin to spend time there. You go out there, there's pump jacks all over the area."

> "Life was calmer, more relaxing. You could live your life as an indigenous person, native person, a person of the land, and you didn't have to worry about all the things that activity brings: new roads, cut lines, the seismic lines that are left behind. You didn't have to worry about the possible oil spills or all the toxins or chemicals that they are bringing in that area due to their activity. You didn't have to worry. You could go about your activities as a Nehiyaw [Cree person] in the land and live off the land as you would without having to say, well, is it safe? What did they leave behind? Where are the seismic lines?"

Many no longer harvest from traditional areas because of this stress and fear for their safety.

WCFN members see the health of the land as being directly connected to the physical, emotional, social, and spiritual health of the people. Throughout the project, the elders would refer to the Woodland Cree people as "*keepers of the land*." Their relationship and responsibility is to care for the land so the land will care for the people. The land is a gift from the creator that must be taken care of.

> "When the land is healthy it's feeding us, it's feeding the animals, it's feeding the birds."

WCFN specifically, and indigenous people in general, are in this way more risk averse than others who do not have this intimate relationship or who do not live close to the land. As we watched the elders dig through the marshes and bushes to show us medicines and food plants, we grasped the meaning of this:

> "We use this medicine as a throat medicine. The root is what we looked for. You dry it and then you chew it. You swallow the juices and spit out the stock."

These medicines come from the ground and are boiled or dried, then ingested. The act of directly consuming resources, in a traditional, creates a direct path for the potential contamination to travel from the resource to people. It was evident from the WCFN project team that the preference is not to consume medicines and other resources from the sites of historic spills; however, many said that sometimes it is necessary because their traditional territory is increasingly impacted, with the numbers and size of "pristine" areas decreasing.

Changing Environment

With the increase in oil and gas activity in the area in the 1960s, the elders witnessed and have recounted many changes to the environment in their traditional territory.

> "I used to trap with my uncle on this trapline since I was about 16. At that time there was no oil and gas activity around this area. There was only a few cut lines. So this is a big change from the 1960s till now. Huge change."

> "Life is not the same as 50 years ago. There's no beavers, no animals, no ducks here."

> "This used to be a running stream – it used to flow [before remediation and reclamation]. It's dammed, but there's nothing living there now. No beavers, no nothing. No ducks. They used to have ducks there."

Most spoke of a general degrading of the environment, a shrinking of usable traditional territory, and a reduction in the health, diversity, and number of animal and plant species. While this was often attributed to resource development in the region, it was clear that land use and broader ecological changes, including climate change and cumulative effects, were also affecting their resources.

> "Even the lakes there's hardly any ducks now. There used to a lot of those things."

> "We haven't had any cranberries for years and we used to have lots."

> "It's not the safest place we live now. There's oil heads all around us."

> "50 years ago we were a really healthy people. We lived off the land. But now? Where's the animals?"

> "There's been a lot of change. Say in the past ten years because there's a lot of activities surrounding the area. There's pump jacks all over. Even in my trapline, there's pump jacks all over."

> "Now lots of roads, power lines, pump jacks, pipelines, noise, dust."

> "We prefer to go where there is no activity. So you see, oil comes in, big footprint, and our territory to live our traditional life, our cultural life, is shrinking."

Many of the observed changes raise alarms among community members, making them feel more at risk on the land. Questions were asked about the effects on pregnant women or young children who might come into contact with product that contains, or breathe air containing, contaminants of potential concern. The project team witnessed this concern in the field when an elder presented a stalk from a plant. The leaves were covered with a fine grey powder. No one was sure what it was. It was something new they

were seeing; no one seemed to trust it, and this film was determined to be a warning indicator of a potential problem with the plant.

Unique observations such as this, by land users who are intimately familiar with their landscape, who use it often, who monitor its environmental conditions, and who have a keen eye for what may be deviant or abnormal are an opportunity to identify emergent or emergency changes in the environment that may be missed by environmental technicians unfamiliar with the area and biota.

The elders observed that in some reclaimed areas, regrowth of vegetation does not provide appropriate habitat for animals. The following is an observation a DFN member shared in discussions with the AER in a separate study:

> "DFN members have observed that original plant communities do not grow back on disturbed areas. They propose that this is partly due to impacts to the root structure of important plants. Some DFN members consider plants growing in areas that have been disturbed to be less "pure" than plants in undisturbed areas, so plants in disturbed areas may be considered useless from a traditional land use perspective, especially for medicinal purposes. It is expected that some medicinal plants will not grow back once they have been removed from an area by a disturbance because the necessary growing conditions will no longer exist. There is also a concern that if reclamation is not done properly, it will not yield useful plant species." (Fehr, 2017)

Perceptions of risk are influenced by the changing environment. People said they have also observed more diseases in their communities as the environment has changed—diseases that have not been present in such numbers in the past, such as arthritis, asthma, cancers, eczema, and psoriasis, are now commonplace in the community.

> "It's [energy development] already damaged our land. Our medicines, our air. What do we have? All kinds of sickness. Never before in my days when I was growing up… there is no one who hardly went to the hospital… we never used to have gallstones, now everyone is having gallstones and cancer and asthma, name it. Diabetes, arthritis. Everyone is getting it. Before, no one was ever laming around… it's awful. It's really damaged our lives."

In the worldview of WCFN, these health concerns, illnesses, and diseases are attributed to the degraded state of the environment. The elders told us that past generations ate from the land and were healthy and looked to the land to be a healer through the collection of medicines, through engaging in cultural activities, and through the renewal, healing and well-being it provides.

While many changes to the environment are perceived as being caused specifically by oil and gas development activities, others are attributed by the elders to the cumulative effects of all industries operating on WCFN traditional lands. "Death by a thousand cuts" is a saying often used in discussions with many nations across Alberta, including WCFN. Knowledge of current and historical oil and gas activity along with its experience with the industry add to WCFN's risk assessment.

The WCFN project team concluded, based on its knowledge and experience, that contaminants of potential concern enter and move through the environment and can potentially be found in traditional resources, including their water sources. The chance of ingesting these contaminants of potential concern is therefore high for people who consume traditional resources. Furthermore, past experience with releases, remediation, and western scientists indicates to them that how they interact with their natural resources is not always accounted for in remediation, and that it is possible for product to be left on the ground after a release and still be considered remediated.

The elders said they believe there might still be harmful chemicals in the ecosystem, and questions remain about the persisting presence of these contaminants and their possible long- and short-term effects on resources and people. From their perspective, the responses they receive from government and industry do not address their concerns. Questions remain as to the reliability and validity of the results of remediation.

> "Look at this growth. We still see the mint growing; the raspberries are going to come out here. Good signs, but you wonder what chemicals are in there. Some stuff may look well but it may not be. We're not assured of that. We're still nervous because we still hear there's a lot of oil still in the ground, is what we hear."

> "…you see something growing and think it's a good sign, but if you pulled it and knew your western science and analyze it well… Like right now the physical stuff, some stuff may look fine, but we don't know."

> "We don't have the technology to do water sampling. Our people don't have the knowledge to take that to the lab."

> "Now it's going to take a Moniaw (a white person) to tell us that the water's no good, you're going to poison yourself."

The assurances that are provided have little meaning in the absence of a relationship and of knowledge of the remediation process and regulations. When asked what it might take for WCFN members to feel that they are not at risk, in reference to a surface water body close to a recent spill, they said the following:

> "Let them come over here and start drinking. It's cleaned up 100 per cent? You all come down and let's make some tea, coffee. We'll have a picnic, pick berries."

> "They have to physically go with us to actually, physically walk the line in there…"

When asked about receiving assurances from industry about a historical spill site, an elder responded, "*I don't know if we would trust that assurance right now. It's been how many years, how many years of seepage going into the trees and plants?"*

DFN members, in a separate focus-group interview, expressed similar sentiments—that assurances about the success of remediation need to specifically address the risks of exposure of individuals to contaminants. The summary of this focus group states the following:

> "DFN members showed an interesting caveat in their concerns, which was that if scientific monitoring could show that DFN members were not being exposed to contaminants, they would be less concerned about health safety…. The difference in assumptions reveals two important points about DFN members: 1) it shows a strong level of concern exists about the impacts to health safety of consuming water, plants, and animals, and 2) it also shows that they acknowledge a limit to how well traditional knowledge, compared to western science, can provide information about the health safety risks of exposure to contamination." (Fehr, 2017, p. 6).

Risk and IK

What does risk perception have to do with the application of IK to remediation and reclamation and other regulatory decision making? Risk perception is about understanding how people see their environment and their place in it. It can reveal how people experience their surroundings, including the interrelationships between ecosystem components; and it can show how people assess their environment and build knowledge. Risk perception can be a window into IK and a powerful tool for applying IK to regulatory decision making. Consider this example from the fieldwork:

> When we began talking about remediation and indicators, or "signs," of a healthy landscape, our discussion turned to water. The AER explained how different guidelines exist for ensuring water is clean and safe and how these guidelines are used, depending on such things as the type of water body and the uses of that water body. Woodland Cree First Nation Project Team spoke of using surface water as drinking water throughout their territory. On a number of occasions during the fieldwork, our caravan of trucks would pull over to fill water bottles at a site known for good, healthy water. Before development, their Elders taught them to look for water with life in it, that was flowing with no film, no smell, no residue left on the banks or in your container. Now they feel that they have to bring bottled water from the community when they go out on the land. They do not know if the water is contaminated or whether it will harm them:
>
> "I would not trust the water around any activity area, and water feeds plants... Now no one thinks it is safe to drink from the old water sources, and now you have to carry bottled water to feel like you're ingesting nontoxic stuff."
>
> "I buy my water. I use tap water for coffee and cooking. But for tea… You ask anybody, we bring our own water. This water is not flowing, it's calm."

WCFN members said that without the necessary information and assurance, they feel they are putting themselves at risk if they drink from traditional sources. When the elders spoke about finding fish with worms in them and moose with lesions and puss sacks, the same conclusions were drawn. Again, this risk perception causes stress and anxiety among the people and is changing their land-use patterns.

Examining the information that indigenous land users take into account, and their risk-assessment process, can help the AER understand and explore the perceived, potential, and actual risks indigenous people are facing in engaging in traditional practices. There is an opportunity for the AER's risk-assessment framework to be made more holistic and reflective of the full spectrum of land uses, if the frameworks were informed by IK perspectives.

Standards

> "Our standards are not your standards." - Chief Isaac Laboucan-Avriom

This was one of the WCFN Chief's first comments in our first planning meeting. During this early meeting, the Chief and Council members spoke of their concerns about the effects of historical and contemporary spills on traditional land and resources, and about subsequent negative impacts on the land and resources and on the health of people who consume those resources. The standards under which remediation and reclamation are planned, implemented, and assessed are not standards based on the activities of indigenous people. Some elders were left wondering how a site that lacks key vegetation or animal populations can be considered reclaimed, or whether the site will support traditional land use activities as it once did. The ways and means by which they assess a safe and usable landscape are fundamentally different from the AER's. They are based on different ways of knowing: IK, and western science.

> "The only bad thing I see with the oil companies: they say, 'oh yeah, it's all OK.' They always have their own guys. It's just like trying to get the fox to go to the chicken coop to look after the chickens. They have their own scientists, their own assumptions, based on what they're told and not based on what the people say living off the land."

WCFN members say that their traditional land use activities and indigenous lifestyle are not accounted for in legislation, policy, or regulation. They add that in their experience, comprehensive studies of impacts on their traditional lifestyle are rarely done. These and other issues emerged as the AER and WCFN teams talked about IK, remediation, and reclamation.

1. Site-by-site regulation, cumulative impacts, and indigenous worldview conflicts

WCFN members experience the world around them in a holistic sense, rather than in parts. Their experience with the land is affected by cumulative human activities and disturbances on their traditional lands, including past, present, and future activities. Energy development activities are a primary concern because chemicals are used that are potentially harmful to the environment and the people. On a number of occasions, WCFN project team members spoke of the cumulative effects of all the development around them reducing and shrinking their traditional territory.

> "We recognize that the reserve is where we live, but the bigger traditional territory is where our livelihood should come from, as per Treaty." This elder noted further that they "prefer to go where there is no activity. Oil comes in, big footprint. Our traditional territory to live our traditional life, our cultural life, is shrinking."

Their experience is not with one well, one battery, one spill, and one product. Their experience is with the cumulative impacts of energy development across their territory on their way of life.

2. Categories of land use

The WCFN were looking for how their land use and occupancy is reflected in how land is remediated and reclaimed. Policies that regulate the remediation and reclamation of specified lands in Alberta identify a limited number of land use types. The land use categories do not always account for traditional land users and the way they interact with the land and resources. For example, the *Reclamation Criteria for Well Sites and Associated Facilities (2010),* land use types include forested lands, peatlands, cultivated lands, and native grasslands, but there is no recognition of cultural and traditional land use as a category.

3. Equivalent land capability and land use capability

Remediation and reclamation of lands in Alberta is guided by the applicable legislation, standards, criteria, guidelines, and policy with the objective of returning specified land to an equivalent land capability. WCFN members would like remediation and reclamation to focus on meeting land use capabilities—specifically, ensuring that they are able to harvest resources from the land and engage in their cultural activities and traditional lifestyle safely.

For example, through our travels, we learned that any surface water body could be a potential drinking water source. Surface water quality in Alberta is addressed by the *Environmental Quality Guidelines for Alberta Surface Waters*, which says the following: "Guidelines for untreated drinking water supply are few, although guidelines or objectives are sometimes developed where warranted. Although mainly relevant to potable water treatment plants, they can also be relevant to the local domestic use of surface groundwater." (Alberta Government, 2014, p. 4).

One elder illustrated this when speaking about the remediation of surface water, a traditional drinking water source.

> "Then we'd say, well would you drink it? 'Well, no, but it's within the limits.' [response of industry representative] It's always within the limits. But I wouldn't drink it, they would say. So what good do the limits do if you can't drink it?"

> "Not one guideline takes care of everything. We got to go by what kind of land use is this."

4. Indicators

The indicators in the reclamation criteria guidelines for well sites include soil, vegetation, and landscape. For remediation, the guidelines focus on the levels of contamination in soil and groundwater. For reclamation, the goal is equivalent land capability.

Reclamation indicators for WCFN include the presence of certain animal species, vegetation, birds, and amphibians, and their ability to consume resources safely.

> "The water is low yet. If it's full, it has to run down over the dam. That means it's going through but it's not. (The water is stagnant now?) Yea, it's really low."

> "We have to see the animals in here."

> "Before the spill? I come here every time there's a lot of beavers in this area. Now that the spill has happened? There's nothing here now."

The *Contaminated Sites Policy Framework* (2014, p. 17) notes that "Alberta Tier 1 guidelines are calculated for five types of land use: natural areas, agricultural, residential/parkland, commercial, and industrial." In reference to exposure to people, this policy also states that "human exposure is assumed to be inconsequential in natural areas, except where underlying groundwater is considered to be a potential source of drinking water" (p. 21). There is a potential gap between the policy intent and the potential risk faced by traditional land users such as the WCFN when using surface water bodies for drinking water.

Throughout the discussions, the health and well-being of the community was a primary concern of the WCFN project team. The indicators of environmental health the WCFN project team looked for are very different from those considered through the AER process.

5. Language and energy literacy

Language was a challenge when communicating between the WCFN and AER. The elders faced much frustration in explaining things to the AER. There are many Cree terms and concepts that have no English translation. Educating the AER, trying to explain these concepts was a constant challenge for the WCFN Project Team. At the same time the AER project team took a lot of time to explain terms such as reclamation, remediation, equivalent land capability, restoration, healthy lands, and usable lands. One elder referred to the term "equivalent land capability" as jargon and pointed out the challenges in using terms like these. Cree is WCFN's first language and is spoken throughout the community. These technical terms are not often used by most of the community. For example, WCFN commonly defined "reclamation" as restoration, or "putting everything back the way it was."

> "We want the land to be what it used to be… same terrain… so you can't take all the muskeg out and take it away. Where are you going to find muskeg to replace it?"

Understanding what these terms mean across cultures and being able to translate them effectively is important for establishing a common understanding and working toward common goals.

Woodland Cree First Nation Vision for the Future

From our first conversations, WCFN project team members had suggestions about how things could change and improve from their perspective. Their suggestions, captured in the following section, aim to build trust, improve the relationship between the nation and the AER, and in some case between the nation and the government, enhance the voice of indigenous people and increase their participation in the regulatory process.

Braiding IK

1) A nation and people indigenous to the land are recognized as such by government, and traditional land use areas are recognized and respected.
   The traditional role of indigenous people as keepers of the land is recognized, respected, and braided into land management and regulatory decision making.

2) IK and western science are equally valued and used in regulatory decision making for project planning, remediation, and reclamation. Indigenous oral histories of industrial impacts are recognized sources of information.

Communication, Engagement, and Community Involvement

3) The nation is involved in regulatory decisions through processes that are inclusive, meaningful and have integrity. This involvement occurs early, spans the lifecycle of energy sector activity, and addresses the concerns and issues raised by the community.

   - Adequate funding is available to allow the nation to conduct IK/TLU studies; and for industry to use the results in project planning, operation, remediation, and reclamation. With this information, the nation is better able to participate in energy development.
   - The nation is an active participant in the environmental impact assessment (EIA) process
   - Criteria appropriate to indigenous rights, traditional land use, and IK are used to determine the requirement and terms of reference for an EIA. These criteria are developed in collaboration with indigenous people.

4) Communication, notification and engagement requirements are improved to ensure the nation is fully informed about all activities occurring on their traditional lands through industry and AER notification (new developments, emergency response plans, remediation plans, reclamation plans).

   - Information is available to all parties, and processes are transparent.
   - The AER provides to the nation regular updates that include information on the applications, releases, remediation, reclamation, operation, and compliance of operators in traditional territories.
   - Indigenous community liaisons are hired, and are independent of industry.

- The nation is informed about the products and chemicals being used in energy developments, including those used for weed control, and about their potential impact on traditional resources and human health. Food safety and risk assessments are a routine aspect of remediation and reclamation communications.
- The nation is informed by industry and the AER of any releases within its traditional territory.
- Chemical-testing results are provided to the nation in plain language and in a way that addresses the nation's issues and concerns.
- All communication from industry and the AER reflects the issues of the nation and responds to its concerns and unique context.

5) Communication and notification must be two-way and must lead to action.
   - When the nation provides information or advice to the AER or industry, the information or advice is adopted with or without modification, or it is rejected. If it is rejected, the AER or industry must provide, in writing, the reasons why it was modified or rejected, and whether or how the interests or concerns underlying the advice have been or will be addressed.
6) Support programs that increase community capacity and involvement in reclamation and remediation.
   - Community monitoring programs are established and supported, and the information that is gathered informs regulatory decision making, including cumulative effects management.
   - Training in initial-spill reporting and response is given to indigenous community members who might encounter a spill while on the land.
7) Trappers are involved, similar to the way landowners are engaged, within the boundaries of their trapping areas and are recognized as valuable sources of information for use in regulatory decision making.

Standards & Indicators

8) Reclamation and remediation *standards* consider indigenous livelihoods, and are reflected in appropriate *indicators* linked to IK. The condition of these indicators are *assessed* (including chemical testing and monitoring of indicators) and compared to standards, and risks specific to traditional land users are identified and evaluated. Appropriate indicators to assess success of remediation or reclamation would include biological indicators for mammals, birds (and their eggs), insects, fish, as well as for vegetation, soil and water. Appropriate standards following remediation or reclamation of an area would include:
   - Ability to support land uses that were available before disturbance,
   - Ability to support specific vegetation, animals, insects,

- Not pose risks to nation members by their use of the area including harvesting and consuming resources (including water, with surface water bodies on traditional lands identified as raw drinking water sources).
- Reclamation and remediation timelines proportional to the impact specific sites have on indigenous livelihoods.

Regulatory Processes

9) The indigenous community has an equal and active voice and role in the regulatory process, and provides industry and the AER with advice, data and information, as appropriate, to move the regulatory process forward.

10) Baseline pre-disturbance site assessments that apply IK are required and used in remediation and reclamation planning. Pre-disturbance site assessments that apply IK and western science are conducted by the nation and include the AER.

11) Remediated and reclaimed sites are monitored over the long term to ensure that they are meeting end-land-use goals. Monitoring involves the nation and includes IK and western science. When testing is done, the testing is conducted by the AER and a representative of the nation.

12) Regular audits, including environmental audits, are conducted on energy developments to explore the impact that a development is having on an area. The nation is actively involved in these audits and receives all documented information and any final reports.

13) Engagement criteria for remediation and reclamation are robust and are designed, in collaboration with indigenous groups, to ensure that indigenous groups are active participants throughout the processes.

- The AER speaks directly with the nation about the remediation and reclamation of sites and will consider the nation's input before issuing reclamation certificates.
- All information provided to the AER by industry and its third-party consultants is provided to the nation to enable the nation to provide the best advice, feedback, and guidance.
- When the nation provides information or advice to the AER, it adopts the information or advice with or without modifications, or it rejects it. If it is rejected, the AER must provide, in writing, the reasons why it was modified or rejected and whether or how the interests or concerns underlying the advice have been or will be addressed.

Stewardship

14) Cumulative effects on traditional livelihood are taken into account in regulatory decisions.

Considerations

In working with the WCFN project team, our question about how to apply IK to the AER process, particularly remediation and reclamation quickly became an exercise in understanding traditional land use and indigenous livelihoods; in understanding the changes WCFN is witnessing and experiencing; and in becoming aware of how energy regulation and development intersect and affect these activities. Active listening, self-reflection, and empathic engagement became our most important tools.

Data and Meaningful Voice

The elders desire a voice and space in the process for their experiences, observations, and concerns as indigenous people to be heard and taken into consideration when regulatory decisions are being made. They looked for assurance that the AER would take seriously the negative and potentially negative impacts that past and future energy development and regulation may have on them. Above all, they were looking to contribute to the AER process through the exchange of information and knowledge. As Casimirri notes, "the focus on TEK [traditional ecological knowledge] as 'data' which can be collected and 'integrated' has detracted attention from the existence and efficacy of Aboriginal systems of land management and the development of alternative ways to meaningfully include Aboriginal people and TEK holders in decision-making regarding resources." (Casimirri, 2003, p. 2). The perpetuation of the perspective that knowledge gaps and misalignments are solely the result of data limitations might prevent the AER from fully realizing the possible full contribution IK can make to regulatory decision making.

Engaging with elders on the land in WCFN traditional territory, visiting traditional use sites, and listening to the elders talk shifted the focus of the work toward gaining a better understanding of indigenous perspectives and experiences and their worldview. This is a central tenet of empathic engagement, which for the AER means "working together so that we can make fully informed decisions and build strong relationships" (Alberta Energy Regulator, 2016, p. 4), and "listening to truly understand values and concerns and sharing information about our work" (Alberta Energy Regulator, 2016, p. 4).

Providing a space within the AER process for the meaningful voices of indigenous land users and IK holders opens the door for IK to enter into the AER process. When we work together to see each other's perspective, we open the door for IK and the AER process to interact in an ethical way.

With the voices of indigenous people contributing to the process, we build a better understanding of people's lifestyle and traditional land use practices; of how they live off the land; of how they are exercising their treaty; of how indigenous people experience regulation and the AER process in their unique land use context; and of the major issues and concerns traditional land users have with regard to the impact of energy development activities on their ability to engage in traditional land use activities and live as indigenous people. This helps the AER understand the positions taken by indigenous groups in statements of concern, alternative dispute resolution, and hearings. It opens the door to help the AER

understand differing epistemologies and worldviews and identify shared interests. Exploring IK in the modern regulatory process is thus a question of how to link the two systems, in order to support fully-informed decisions and actions.

Education and Capacity Building

The Alberta Model for Regulatory Excellence (Alberta Energy Regulator, 2016) identifies stellar competence as one of the principles of regulatory excellence and defines it as people having the "required and necessary tools to carry out their responsibilities, which underpins our ability to achieve outcomes while adapting to new risks and opportunities" (Alberta Energy Regulator, 2016, p. 3). Stellar competence also means looking outside the organization for expertise and information to ensure informed decision making (Alberta Energy Regulator, 2016, p. 3).

IK is important for the AER, and we must strive to build capacity and competency on IK. Experience from this project indicates that the approach must be immersive, authentic, and holistic. Its design, implementation, and assessment must include indigenous people. As Little Bear notes, "in order to appreciate or 'come to know' the Native American science way, one has to understand the culture/worldview/paradigm of Native American people" (LittleBear, 2000). WCFN elders would also add that having experienced their way of life is essential. Furthermore, when considering integrating knowledge systems, many insist that knowing the differences between IK, western science, and resource management, and knowing the benefits and challenges facing knowledge integration on practical and theoretical levels are prerequisites for this work (Davis, 2006, Moller et. al, 2004).

The Human Dimension

IK reflects the interdependent, inherent relationship between people, the land, and resources. WCFN questioned how reclamation and remediation can be considered complete if those interactions and relationships are not examined, if the interconnectedness of all things is not considered, if the community is not involved in the assessment, or if the area was determined to be not usable by WCFN. WCFN members noted that while they are aware of areas that had been reclaimed in the past, they would still not support traditional land use activities or indigenous lifestyles at those locations because they are hesitant and apprehensive about what the standards are for reclamation and remediation. This explains why WCFN members emphasize the importance of seeing themselves and their way of life reflected in the regulation of energy development, and of knowing that their interests and safety are being addressed appropriately. Creating space for the indigenous people of WCFN is a means of achieving this.

Telling Each Other – Wihtamâtotan

> "Before when you something like this [release] happened did you look at the place and the people who lived there? Nothing entered your mind about that. Now when something does happen you going to see who's it affecting right now."
>
> WCFN elder

The purpose of this project was to engage in a joint learning process with WCFN to identify opportunities, challenges, constraints, and practical approaches for linking IK within the regulatory framework of the AER. As this project evolved, the participants learned that there is no silver bullet or universal set of steps to effectively and appropriately apply IK to remediation, reclamation, or regulatory decision making in the energy sector. It is a complex undertaking that requires iterative and incremental changes over time. As Huntington notes in reference to braiding knowledge systems, "Such efforts require investment. No shortcut can replace the time, effort, and expertise required to carry out successful projects involving traditional knowledge; no missing key will unlock that storehouse of information in one quick and easy step" (Huntington, 2016).

This report is intended to raise awareness within the AER of how WCFN members have experienced energy development and the regulatory system, with a focus on remediation and reclamation. Community members have told the story of the impacts they have felt and have recommended places in the regulatory system where WCFN members feel their knowledge and experience could be applied. The research model applied in this project illustrates the strength created by taking a multiple evidence base approach to the braiding of IK and western science in the regulation of energy resources. By building on the work of *Voices of Understanding*, this project has demonstrated the critical importance of creating, within AER initiatives, a space that reflects indigenous worldviews and that supports us in "telling each other" in a meaningful way.

WCFN was clear in saying that its standards are not our standards, and this raises the question of how we assess these multiple sources of evidence to make one informed decision. Desired outcomes for the community include the development of indigenous indicators for reclamation and remediation, opportunities for community-based monitoring and for community involvement in inspections, and improvements to communication and notification requirements, including how communities are engaged during reclamation. For the AER, it will take time, consistent effort, and commitment to critically reflect on how the energy regulatory system currently considers and incorporates IK and to then transition from reflection to action on creating an ethical space where processes are braiding western science and IK into decision-making process

Appendix 1 Methods

> "We may elicit and force secrets from nature, but it is only answering the specific questions we ask it. It is not giving us the whole story as it would if it were specifically involved in the communication of knowledge."
>
> (Deloria et al., 1999, p. 136).

Scoping & Planning

This initial step in the project focused on understanding what the wants, goals, and overall motivations were for WCFN and the AER in order to identify where the common and uncommon ground might lie. To this end, meetings were held between representatives of the AER, the WCFN chief and various members of council, and WCFN Lands Department staff to discuss WCFN's vision for and desired outcomes from collaborating on the potential pilot project. Two more discussions took place between the AER, the WCFN elder's council, and a smaller WCFN project working group (a subset of the elder's council).

In these meetings, the project scope, objectives, content, and steps were identified and the most appropriate approach identified. This was presented and approved by the chief and council. The focus was to be as collaborative as possible when developing the pilot project to ensure that we were understanding the issues in order to address them appropriately through project design. This approach is consistent with the principles of CBPR that are the standard approach for IK collaborative research.

Capacity Building Through Joint Learning

The foundation of the project began with awareness that WCFN members had limited knowledge of remediation and reclamation related to oil and gas and of the role and responsibilities of the AER, and that the AER field team had little knowledge of WCFN, its history, and its activities on the land. This spurred the need to increase the knowledge of all parties. Joint learning was the approach selected through which this would be accomplished.

The AER would discuss its role in energy development, current opportunities for public involvement in the AER process, and the legislation, regulations, requirements and criteria, and process for remediation and reclamation. WCFN members would discuss their history and land use, and the environmental concerns they have related to remediation and reclamation of energy development. These sessions created a strong foundation on which the field work could take place. They created the ability to have more meaningful discussions. Joint learning encouraged the AER field team to look at its processes and requirements through a different lens and encouraged the integration of knowledge systems.

The AER conducted three joint learning sessions at Cadotte Lake. These took the form of presentations and discussions. Practical demonstrations were then given in the field to reinforce some of the concepts. WCFN opted to combine fieldwork activities with their joint learning session, citing their preference to

"show us rather than tell us." At each field site, WCFN working group participants were interviewed, formally and informally, to encourage discussion and information sharing and to prompt for specific details.

Fieldwork

Fieldwork was conducted in July 2017. The WCFN working group selected several traditional-land-use sites they felt were either clean, healthy, and safe to use (two sites), had been remediated and reclaimed (two sites), were being remediated at the time (two sites), or were no longer healthy and safe to use (one site). The seven sites were visited over three days. At each site, WCFN participants were interviewed and demonstrations of reclamation and remediation assessments took place. Information was documented about how the areas were (or are) used, the history of the area, the resources and issues of potential concern, and how the WCFN participants would like their information, knowledge, and concerns applied to remediation and reclamation. Notes and audio and video recordings were used to document the fieldwork site visits.

Data Analysis & Recommendation Development

At this stage, the notes and audio and video files (the project data) were thematically analyzed to identify and report patterns. The analysis focused on identifying reoccurring issues and the broader themes raised by the WCFN working group. The thematic analysis was inductive in that it was driven by the content of the data, not by existing concepts or ideas. The advantage of thematic analysis is its independence from a specific theory and epistemology. "Through its theoretical freedom, thematic analysis provides a flexible and useful research tool, which can potentially provide a rich and detailed, yet complex account of data" (Braun & Clarke, 2006, p. 5).

Recommendations were developed based on the themes and issues raised by the WCFN working group. Once a complete list was developed, the recommendations were reviewed and verified by the WCFN project team.

Validation & Report Writing

"Validity is like integrity, character, and quality, to be assessed relative to purposes and circumstances" (Brinberg and McGrath in Maxwell, 1992, p. 280). Community validation is an essential component of this research, the focus of which is on interpretative, rather than descriptive, validity—i.e., the validity of the researcher's interpretation of the phenomenon observed and the research participants' perspective.

Three validation workshops were held with the WCFN project team, each with more detail than the previous meeting. During these meetings, the issues, themes, and evidence were presented for reflection and comment, recommendations were discussed and refined, and word usage throughout the report was

refined to better reflect the elders' sentiments. After this session, changes were made to reflect the feedback received. The results are in this report.

Limitations & Constraints

- Only one three-day fieldwork session—true comprehension of the complex nature of IK and WCFN ways of knowing would take more time, exposure, and study.
- The scope of discussion was often limited to the authority of the AER.
- Large fieldwork teams and groups resulted in a broad collection of data from many sources and sites, although with limited depth of examination from specific informants.
- Participant observation of traditional use activities was limited.

Appendix 2 A Report on Focus Groups with Driftpile First Nation

Indigenous Traditional Knowledge & the Regulatory Process: A Report on Focus Groups with Driftpile First Nation

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Executive Summary

The Alberta Energy Regulator (AER) is working with Woodland Cree First Nation (WCFN) on an initiative called *Indigenous Traditional Knowledge and the Regulatory Process: A Pilot Project with the Woodland Cree First Nation* (the ITK Project). Driftpile First Nation (DFN) has a role, separate from WCFN, in the ITK Project after accepting an invitation from the AER to share concerns and solutions about using traditional knowledge in reclamation and remediation. The objective of the work with DFN was "to better understand the perspectives of DFN concerning the potential application of traditional knowledge relating to reclamation and remediation processes and decision making by the AER."

Three four to five person focus groups, facilitated by an AER contractor, were held to achieve the objectives. Each focus group visited either a reclaimed oil well on the DFN reserve or a test reclamation site on the DFN reserve. In accordance with DFN protocol for working with community members, an open house was held to introduce the project before the focus groups took place and a verification meeting was held afterward to provide DFN members the opportunity to scrutinize and improve the information collected during the focus groups.

Results of the focus groups showed that DFN community members have concerns and solutions related to both remediation and reclamation but that they are much better articulated for remediation than for reclamation.

Recommendations to the ITK Project

- Contrast DFN concerns and solutions with WCFN concerns and solutions. What are some notable similarities and differences? What might they be attributed to?
- Review solutions proposed by DFN members, and determine which are appropriate for inclusion in the final report of the ITK Project.
- In future reclamation work with indigenous communities, elicit reclamation preferences by presenting a range of structured reclamation scenarios and outcomes.

Background

The AER is working with WCFN on an initiative called the ITK Project. DFN has a role, separate from WCFN, in the ITK Project after accepting an invitation from the AER to share concerns and solutions about using traditional knowledge in reclamation and remediation. DFN is a band of approximately 1000 on-reserve members, is located on the south shore of Lesser Slave Lake, and is a signatory of Treaty 8 (Driftpile First Nation, n.d.). DFN had previously hosted the AER for a regulatory hearing where concerns about reclamation and remediation were shared. DFN had also expressed concerns, in other instances, related to reclamation and remediation processes and their impacts on traditional land uses. These events provided the AER with the pretext to extend the invitation. DFN accepted after a proposal was supplied by the AER and after a meeting was held between the DFN Chief and Council, the DFN consultation director, an AER staff member, and an AER contractor on May 10, 2017.

Objectives

Indigenous Traditional Knowledge and the Regulatory Process Project: A Pilot Project with the Woodland Cree First Nation

"The purpose of this study is to engage in a collaborative joint-learning process that identifies opportunities, gaps, and tactical means in which western science and indigenous traditional knowledge (ITK) systems can be braided and integrated into the regulatory framework; specifically in reclamation and remediation processes, rules, and requirements (Alberta Energy Regulator, 2016)."

Driftpile First Nation Focus Groups

To better understand the perspectives of DFN concerning the potential application of traditional knowledge relating to reclamation and remediation processes and decision making by the AER. This would support and align with the ITK Project. Proposed research questions:

1) What does a successfully remediated and reclaimed landscape look like from the DFN perspective?
2) How does DFN know a remediated and/or reclaimed site is 'safe' or appropriate for traditional land uses? What things do you look for? When does DFN consider a place to have been remediated and/or reclaimed well enough to feel comfortable hunting and gathering there?
3) How can traditional knowledge be used to inform reclamation and remediation?

Methodology

The work done with DFN consisted of three three-hour semi-structured focus groups of four to five DFN members each. One group consisted of women, one of men, and one of youth. Gender and age specific perspectives were valuable to the study because they provided experiences and knowledge that ranged across types of traditional land uses practiced, as well as locations of practice and time of practice. The DFN consultation director and a DFN translator were additional participants in each of the three focus groups to help facilitate the discussion. An AER contractor acted as the lead facilitator and an AER staff

member was present to answer questions and engage focus group participants in dialogue on reclamation and remediation issues.

A community meeting was held on July 4, 2017 to introduce the work that focus groups would engage in with the AER and the focus groups themselves were held on July 5 and 6, 2017. An interview guide was applied to each focus group to keep the line of questioning consistent. Each focus group was audio recorded and notes were taken on large sheets of paper in front of focus group members so they could see how their comments were being recorded. Two focus groups visited an on-reserve oil well where the infrastructure had been removed and some replanting of vegetation had been done. It is not clear to what specifications, if any, the site was reclaimed to. The third group visited the site of the Driftpile Reclamation Project[7]. These field visits were made to continue the table top discussions of the focus groups in a new environment to stimulate further discussion about applying traditional knowledge to remediation and reclamation.

Member checks were used to confirm accuracy of statements made by prior focus groups. In the analysis and reporting stage, a hybrid a priori-grounded coding system was used to elicit themes from focus groups and to organize the report. A verification meeting was held on August 8, 2017 and was attended by nine community members and the DFN consultation director. A presentation was delivered by the AER contractor that summarized the comments DFN members shared during the three focus groups. DFN members shared feedback on the completeness and accuracy of the summary.

The work done with DFN was completed in accordance with community protocols for sharing traditional knowledge with external organizations.

Definitions

Reclamation

This is the definition provided on the AER's webpage (Alberta Energy Regulator):

Reclamation is defined in the *Environmental Protection and Enhancement Act* and the *Conservation and Reclamation Regulations* to mean any or all of the following:

- Removing equipment or buildings and other structures
- Decontaminating buildings or other structures or land or water
- Stabilizing, contouring, maintaining, conditioning, or reconstructing the surface of the land to a state of "equivalent land capability"

[7] A partnership between Driftpile First Nation, Shell Canada, the Woodlands Operations Learning Foundation and Northern Lakes College to look at opportunities to improve reclamation practices using traditional knowledge. Preferred plant species were selected, germinated, then planted at a site comparable to an oil well pad on the DFN reserve to see how growth would progress.

Basically, "equivalent land capability" means that energy companies must do everything they can to return the land to a state functionally equivalent to what it was before the development took place. The land needs to be able to support various uses, even if those uses are slightly different from what the land supported before the activity began. The time it takes to complete the reclamation can vary; regardless, the AER must be satisfied that all requirements have been met before certifying a site reclaimed.

Remediation

This is the definition provided on the AER's webpage (Alberta Energy Regulator):

- Remediation involves removing, reducing, or neutralizing substances, wastes, or hazardous material from a site to prevent or minimize any adverse effects on the environment now or in the future.
- Remediation is also called decontamination.

Remediation is a subset of the activities needed to fully reclaim a site.

Traditional Ecological Knowledge

Usher (2000) gives a broad definition: "traditional ecological knowledge refers to all types of knowledge about the environment derived from experiences and traditions of a particular group of people." Traditional ecological knowledge can also be broken down into constituent elements for practical use in western resource management. Houde (2007) describes six 'faces' of traditional ecological knowledge:

1) Factual observations of the environment, classifications, and system dynamics
2) Environmental management systems
3) Factual knowledge regarding past and current uses of the environment
4) Environmental ethics and values
5) Traditional ecological knowledge as a vector for cultural identity
6) Cosmology

Reclamation and Remediation Concerns

DFN members communicated two broad concerns during focus group discussions, one related to remediation and the other related to reclamation. The remediation concern is that risk to health safety from consumptively using water, plants, and animals in the Swan Hills/Virginia Hills area (i.e. DFN's core traditional territory) has emerged and increased over the past several decades. This concern stems from DFN members witnessing contaminants entering the environment from sources such as hydrocarbon spills, herbicide application, improperly disposed sewage, and releases of PCBs, dioxins, and furans from the Swan Hills Treatment Centre[8].

[8] A release of PCBS, dioxins and furans into the atmosphere occurred at the Swan Hills Treatment Centre in 1996.

The reclamation concern is about impediments to practicing traditional land uses that DFN members face because of disturbances to the landscape. This concern stems from observations among DFN members that the Swan Hills/Virginia Hills landscape has and continues to become increasingly disturbed over the past several decades, which constrains opportunities to practice traditional land uses.

Remediation Concerns

It is necessary to understand DFN members' conceptual site model, or the way in which they perceive contaminant movements through the environment, to understand why their concerns about remediation are primarily health safety related. It reflects DFN members' assumptions about the sources of contaminants, the pathways used by the contaminants to travel through the environment, and how they impact DFN members (Table 1). The conceptual site model of DFN members shows how it differs from that of a basic western science model and, therefore, offers insight into some solutions that may address health safety concerns of DFN members.

Table 1. Contrast between DFN members' conceptual site model and a basic scientific conceptual site model

Conceptual Site Model	Contaminant Sources	Contaminant Pathways	End Receptors of Contaminants
DFN Members	• Hydrocarbon spills from ruptured pipelines, and abandoned wells • Herbicide application • PCBs, dioxins and furans released from the Swan Hills Treatment Centre • Improperly disposed sewage	• Water will take up contaminants directly from sources. Creeks, rivers, lakes, muskegs are major vectors for contaminants. Whether untreated water from the Swan Hills/Virginia Hills area, Slave Lake or drinking water from the Town of Slave Lake or the DFN reserve, it is loaded with contaminants • Plants will take up contaminants directly from sources, the water and the air • Animals will take up contaminants directly from sources, the water, the air, and the plants, and will spread contaminants when they travel away from the area where they became contaminated	Fear that DFN members consuming traditionally used plants, animals, and water are exposing them to contaminants. Infer that exposure to contaminants is causing some illnesses found in the community
Basic Scientific	Same as above	• Water may take up contaminants directly from sources and the air • Plants may take up contaminants directly from sources, the water, and the air • Animals may take up contaminants directly from sources, the water, the air, and the plants	Unsure of extent to which DFN members consume traditionally used plants, animals, and water and how they are prepared for consumption, so unsure of exposure of DFN members to contaminants

Table 1. reveals a key difference in assumptions upon which the conceptual site models of DFN members and the basic scientific model are predicated. DFN members assume that contaminants that enter the environment *will* certainly reach them in quantities that are great enough to impact human health. The basic scientific conceptual site model does not make assumptions about whether contaminants entering

the environment reach DFN members. It recognizes that contaminant pathways to DFN members *may* make exist but that contaminants *may* also be prevented from reaching the receptor in some other way such that health impacts are avoided. However, DFN members showed an interesting caveat in their concerns, which was that if scientific monitoring could show that DFN members were not being exposed to contaminants, they would be less concerned about health safety.

The difference in assumptions reveals two important points about DFN members: 1) they show a strong level of concern about the health impacts of consuming water, plants, and animals, and 2) they acknowledge a limit to how well traditional knowledge, compared to western science, can provide information about the health safety risks of being exposed to contamination through consumption of traditionally used plants, animals, and water.

Reclamation Concerns

DFN members often consider disturbed sites to be contaminated in addition to being unusable for traditional land uses so disturbed sites have all the problems of a disturbed site plus the problems of a contaminated site. Even if a disturbed site is not considered to be contaminated, the disturbance can still make DFN members consider the site to be unusable for traditional land uses.

A general concern that cut across specific concerns about disturbances was reclamation timelines. From their observations of disturbed sites, DFN members could not get a sense of the timelines for completion of reclamation and found this unacceptable. They also shared some specific concerns about impacts to traditional land uses caused by disturbances to the landscape:

Reference Landscape Features
DFN members pointed out that important landscape features, such as trails, that were used as reference points for navigating the land and for facilitating the intergenerational transfer of knowledge have been destroyed or disturbed by industrial activity and cannot be reclaimed.

Plants
DFN members have observed that original plant communities do not grow back on disturbed areas. Some DFN members consider plants growing in areas that have been disturbed to be less ‘pure’ than plants in undisturbed areas so plants in disturbed areas may be considered useless from a traditional land use perspective especially for medicinal purposes. DFN members expect that some medicinal plants will not grow back once they have been removed from an area by a disturbance because the necessary growing conditions will no longer exist. There is also a concern that if reclamation is not done properly, it will not yield useful plant species.

Animals
Another observation is that regrowth of vegetation on disturbed areas often does not provide appropriate habitat for animals. DFN members have also observed salt licks (salty, muddy waters that moose drink

from and that DFN members use as hunting sites) permanently compromised by disturbances to the source waters that maintain them. DFN members are not confident that salt licks can be reclaimed.

Water

In addition to concerns about disturbances to the source waters of salt licks, DFN members expressed concern about sedimentation of the Driftpile River as well as other bodies of water in the Swan Hills/Virginia Hills area. They shared their belief that sedimentation has impacted fish populations and said that sedimentation is a factor in the decisions of DFN members to no longer swim in the Driftpile River and to no longer drink from it either. Forestry and oil and gas sites were used as examples of disturbances that contribute to sedimentation.

Risk Preference and Avoidance Areas

DFN members revealed that, although there is a general concern about health safety, levels of risk preference for practicing consumptive traditional land uses in areas they believe to be contaminated vary by member. If the level of risk in an area is believed to be too high, DFN members will avoid practicing consumptive traditional land uses there altogether. This results in some DFN members abstaining, in perpetuity or for long periods of time, from practicing traditional land uses in these areas, while others do not allow these concerns to affect their practices. DFN members communicated that they do not differentiate between types of contaminants (e.g. PCBs, dioxins, furans, hydrocarbons, herbicides, raw sewage) because they do not know the differences between them. As a result, these contaminants all fall into the category of 'contaminants that could impact human health.' Risk preference and avoidance areas are best illustrated through examples about water, plants and animals shared by DFN members.

Bottled water rather than water taken untreated from waterbodies is used by DFN members when they are on the land, partly due to a cultural change and partly due to a belief that waterbodies in the Swan Hills/Virginia Hills area have been contaminated over the past several decades. As one DFN member put it, "In the Driftpile River in the 90's – we grew up at the river, it was like our playground right. Basically, one day there was a bunch of foam coming out of the river that had feces so we found out that the government had regulated that the sump pump, the pumphouse could put into the fresh water bodies. We were like 'OK, we're, I'm not swimming with poop,' I'm sorry. We didn't feel that it was safe or healthy to do that anymore." This comment reveals that contamination events stand out in the minds of DFN members and can alter their practices for long periods of time.

Another example is harvesting of plants for medicinal purposes. "My dad used to say, 'only for emergency purposes.' If you can't go to a pure place that hasn't been disturbed, to pick your medicine, and if you have to pick your medicines on a pipeline right away of way or a disturbed area, he said 'yes, but be careful of them.' You have to clean them a lot better before you actually try to use that." This quote shows that although gathering medicines from disturbed areas should be avoided, there are circumstances under which it is appropriate to harvest them.

Some DFN members will hunt for moose around the Swan Hills Treatment Centre but others will not for fear of health impacts caused by eating contaminated moose. These hunters fear that contaminants released by the facility may still be lingering in the environment. “My concern over that treatment plant is that I look at it as negative hunting grounds. Because of the toxic or whatever spill they had there – release.” This member believes the health risk of consuming meat harvested from around the Swan Hills Treatment Centre is too great to justify hunting in that area.

Proposed Solutions

DFN members laid out some changes that they desire but did not provide a solution for each reclamation and remediation problem. They believe that these changes would improve the regulatory process, build the credibility of the regulatory process, and build their own confidence in it. Recommended solutions fall into five categories:

Informing about spills, and remediation and reclamation planning

- DFN should be notified of all hydrocarbon spills, including land location of the spill site, type, and volume of product spilled, and health and safety considerations. These are the information requests made of companies when DFN finds out about spills
- DFN should be notified of reclamation and remediation projects
- The AER should create a document accessible to DFN that provides details of all environmental liabilities in the province including spill sites, reclamation and remediation sites, and orphan well sites. The document should include details such as the state of remediation and reclamation at the site and how it will be or has been remediated or reclaimed
- Signage should be posted at spill sites, and remediation and reclamation sites with an explanation of what activity occurred there as well as possible health and safety risks
- Technical information shared with DFN should be accompanied by plain language explanations
- One option for informing DFN could be through registered mail, like the approach oil and gas and forestry companies use with trapline holders
- Another option, proposed in the verification meeting, for informing DFN could be through public announcements on Facebook RCMP or AER Facebook pages

Involvement in remediation and reclamation planning

- DFN members should be allowed to participate in hydrocarbon spill hearings held by the AER on the basis that spills impact practice of traditional land uses
- DFN members should be allowed to participate in remediation and reclamation planning. Some of their objectives include:
  - Removal of all infrastructure, including pipelines and powerlines, from reclamation sites

  - Removal of all contaminated soil from remediation sites
  - Setting appropriate timelines for completion
  - Reclamation of sites back to their original plant community
  - Planting of species that prevent sedimentation of water bodies and provide habitat for animals
- It should be required that DFN approve reclamation certificates for sites in their traditional territory

Responding to spills

- There should be more rapid responses to spills so that the quantity of hydrocarbons that enter the environment are minimized. A more rapid response could include equipping DFN members with appropriate first responder gear, such as booms to stop spilled hydrocarbons spreading in water bodies

Monitoring remediation and reclamation sites

- DFN monitors should be on site during reclamation and remediation to confirm it is completed as planned
- DFN monitors should patrol pipelines and wells since some spills are only detectable by sight
- Monitoring should occur over all four seasons and the length of the monitoring period should be long enough for DFN members to have a visual understanding of the final phase of reclamation
- Soil and water testing on remediation and reclamation sites should be done and the results shared with DFN

Researching concerns identified by traditional knowledge

- The AER should support research with DFN on topics such as:
  - Contaminant levels in moose meat
  - Sedimentation in waterbodies in the Swan Hills/Virginia Hills
  - The impact that consumption of ‘drilling mud’ has on moose

One DFN member at the verification meeting pointed out that science and traditional knowledge can be used to verify the hypotheses of the other.

Hopes and Fears for the Application of Traditional Knowledge

Indigenous communities are often reluctant to share traditional knowledge outside of their membership so DFN members shared their hopes and fears for how the traditional knowledge they imparted to the AER would be used.

Hopes

- DFN members will have the opportunity to do follow-up work with the AER

- DFN members and WCFN members will have an opportunity, facilitated by the AER, to sit down together to discuss remediation and reclamation
- The information that DFN members shared will provide justification for changes to the AER's remediation and reclamation processes

Fears

- DFN members will be studied to death but the knowledge they share will not ultimately be applied to AER remediation and reclamation processes
- The information that the AER gathers will be leaked to other organizations or businesses and used against DFN

Other Concerns

DFN members shared concerns that fell outside the mandate of the ITK Project or outside of the mandate of the AER altogether:

- Consultation with DFN never results in significant changes to proposed projects e.g. pipelines are never rerouted away from areas valued by DFN members
- CN Rail accidentally transports noxious weeds and spreads them through DFN traditional territory
- The AER and the Alberta Utilities Commission should be sharing information about how to use traditional knowledge since both organizations regulate infrastructure that impact traditional land uses
- DFN needs more capacity funding to participate fully in traditional knowledge work

Analysis

DFN members expressed and revealed their concerns about reclamation and remediation using several 'faces' of traditional knowledge (Houde, 2007):

Factual observations of the environment, classifications, system dynamics: DFN members have a reference point for what the Swan Hills/Virigina Hills area looked like several decades ago, before industrial development began in earnest. Since that time, they have observed changes in the environment (e.g. hydrocarbon spills, orphan wells, unreclaimed lands) and are concerned about the impacts of these changes to their health and to their traditional land uses.

Factual knowledge regarding past and current uses of the environment: Some DFN members practicing traditional land uses have changed their practices in response to observations of changes in the environment.

Environmental ethics and values: Among a multitude of environmental ethics and values held by DFN members, an ethic apparent in some is that plants harvested on disturbed lands are not as valuable as those harvested on undisturbed lands because plants harvested on disturbed land are considered more potent.

DFN claims to have high standards for reclamation and remediation. In terms of remediation, this is evident in the requests of DFN members for more complete removal of contaminants and infrastructure from remediation and reclamation sites, clear timelines, and faster responses to spills. DFN members want potential contaminants restricted from entering the environment as much as possible to protect traditional land uses and the health of other members. DFN members use their observations of the environment to identify potentially contaminated and disturbed areas, but they want to use western science for monitoring and verification.

DFN members views on reclamation are more challenging to understand. One recurrent theme is that the land should be put back precisely to the way it was before any disturbance occurred. However, there is a variety of perspectives on whether land is ever usable once it has been disturbed. Beyond putting the land back to the way it was before it had been disturbed, it is difficult to get a sense of what successful reclamation looks like to DFN members. There was some suggestion that some values that should be reflected in the final state of reclamation include: animal habitat, plants valued for traditional land use, and plants that reduce sedimentation of water bodies.

Recommendations to ITK Project

- Contrast DFN concerns and solutions with WCFN concerns and solutions. What are some notable similarities and differences? What might they be attributed to?
- Review solutions proposed by DFN members, and determine which are appropriate for inclusion in the final report of the ITK Project.
- In future reclamation work with indigenous communities, elicit reclamation preferences by presenting a range of structured reclamation scenarios and outcomes.

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