

Report: Improving Indigenous-Industry Collaboration on Oversight of Imperial Oil's Aquatic Monitoring Program through the Establishment and Convening of a Sahtu Water Community of Practice

Introduction and Background

In the fall of 2020 the NWT Environmental Studies Research Fund (ESRF) gave funding to the Yamoga Land Corporation to support its responsibility to maintain oversight of Imperial Oil's Aquatic Effects Monitoring Program (AEMP) via the Sahtu Land and Water Board. Through a community roundtable of environmental researchers and the community of Fort Good Hope (known as a Community of Practice or COP) the landscape of water research in K'asho Got'ine District was discussed, with gaps identified alongside a follow-up plan for Industry Engagement with Imperial Oil regarding desired modifications for their AEMP.

This report summarizes the research presented at the inaugural COP, discussion themes, identified gaps and next steps.

Membership of the Community of Practice

Yamoga Land Corporation currently supports water research in K'asho Got'ine District. Through outreach with current research partners a snowball method was used to identify other potential academic researchers with relevant projects for participation in the COP. In total 16 researchers were invited. A list of invitees can be found in Appendix 1

At the COP 10 researchers attended representing the Cumulative Impacts Monitoring Program (CIMP), Environment and Climate Change Canada, the Government of the Northwest Territories, Wilfrid Laurier University, Global Water Futures, the Sahtu Renewable Resources Board, L'Institut national de la recherche scientifique and the University of Waterloo. A list of attendees can be found in Appendix 2.

K'asho Got'ine Participation in the COP

In total, 20 people in Fort Good Hope attended the COP. They represented the K'asho Got'ine Foundation, The Tuyeta Management Board, the K'asho Got'ine Guardians, Elders, the Fort Good Hope Renewable Resources Council, the Yamoga Land Corporation Board, the K'asho Got'ine Dene Band, the GNWT, Independent Indigenous researchers and one representative of the Sahtu Land and Water Board presented on the state of the Board's interactions with Imperial Oil.

Summary of Research Presented

8 research projects were presented at the COP, in plain language (and translated into Dene K'e as needed).

Government of the Northwest Territories

Gila Somers summarized the NWT Community-Based Water Monitoring program, a part of the NWT Water Stewardship Strategy and Action Plan. They presented a broad overview of where the NWT is currently taking samples, when and how they work with the community to support

water sampling and provide their data as an open-source resource to all. This program also is on the cusp of having sufficient data to begin looking at trends over time, which is a new and exciting development.

Environment and Climate Change Canada and CIMP

Kirsty Gurney presented research on wetlands and water quality examining how forest fires affect water quality in Ts'udé Niljné Tuyeta. The preliminary findings show that in small wetlands there are changes where fires have been present, affecting water quality and nutrient levels. The project will continue to monitor other aspects of wetland life cycle and climate change that may affect these preliminary results to confirm the findings.

Kirsty Gurney presented a second project examining levels of hydrocarbons (also known as Polycyclic Aromatic Compounds or PACs) in water bodies in the Sahtu. This research is in its initial stages with most work to date being training of locals to begin sampling. However, samples in 2020 show that hydrocarbon levels are higher in Norman Wells than they are in other places sampled in the Sahtu. More samples will be collected shortly across the Sahtu for 2021.

COP-Commissioned Literature Review on PACs

Jordyn Stalwick presented a literature review commissioned by the COP on hydrocarbons (PACs) to help inform general understanding of these compounds and the role they may play in aquatic contamination. As this research is key to understanding the concerns of the COP it will be summarized in slightly more detail here.

Stalwick presented that PACs (or hydrocarbons) are a group of chemicals formed during the incomplete combustion of organic material or formed as a by-product during the natural formation of fossil fuels. There are different types of PACs, but two are most likely due to human activity (namely Parent Higher Molecular Weight PHMW and Alkylated Higher Molecular Weight AHMW). 32 PACs are listed as priority pollutants by the US Environmental Protection Agency and are listed under Schedule 1 of the Canadian Environmental Protection Act.

Some PACs have natural sources, such as natural oil seeps and/or forest fires. Some are produced during oil and gas combustion or oil spills. Some PACs have carcinogenic properties and over the past 25 years increased concentrations of PACs have been seen in animals lower in the food chain.

Stalwick presented that the MacKenzie River has 10 times the levels of PACs compared to smaller rivers (most likely due to natural oil seeps), however PACs related to human activity are significantly higher near Norman Wells than they are upstream and downstream from the town. Data suggest PACs bind to sediment. This means they may not travel far as they settle on the bottom, but it also could mean that they attach to lighter sediment and travel down river. This means more sampling of sediment is needed to understand the levels in sediment. However, sampling sediment in a moving river presents challenges and is difficult to complete.

Of the 42 types of PACs, only 9 have been studied sufficiently to determine safe levels. These guidelines date from 1999 which does not reflect the latest knowledge or technology. It is Stalwick's conclusion that updated guidelines of non-harmful levels of PACs for all 42 types are needed.

Stalwick presented that Imperial Oil presented data around PACs near their operation in Norman Wells in 2013. According to Imperial Oil they were able to detect which PACs were due to natural oil seepage and which were due to human industrial activity but they have not shared this data with researchers, nor have they shared more current data beyond raw data in a report in 2013 as an annual report appendix with no associate analysis. Imperial Oil also did not measure PACs upstream and downstream of Norman Wells.

Finally, Stalwick presented that PAC levels in humans in the Dehcho and Sahtu region have been measured. While the concentrations in humans are low enough not to be associated with adverse health effects they are nonetheless generally higher than the concentrations found in Canadians living in other areas. Stalwick recommended a thorough investigation of the sources of PAC exposure.

Northern Contaminants Program - Lead Exposure

Kelly Skinner presented an investigation into lead exposure in the Sahtu region. The study aims to produce a literature review on routes of exposure to lead for Northern Canadians, investigate lead levels in hunter-shot birds in water and conduct a survey of community members on risk factors to lead exposure. The preliminary findings show that harvesting of game with lead-based ammunition may be the main source of exposure. Lead levels were low in water and low in fish sampled (burbot). 20 bird carcasses have been collected but not yet analyzed. The survey has been developed but not distributed.

Land Cover and Changes in Water Quality - Global Water Future and Sahtu Renewable Resources Board

Kristen Bill presented their research as to how permafrost thaw is changing land cover, which can in turn affect the water quality in downstream lakes. In 2022 there will be a water knowledge camp to support communities for on-the-land knowledge sharing and to build capacity for youth and guardians to conduct research in the fall of 2022.

L'Institut national de la recherche scientifique - Safe Drinking Water Access

The project presented by Jérôme Comté aims to evaluate how climate change can influence the quality of drinking water, to assess the presence of chemical and microbial contaminants in the water and to establish with the community a drinking water quality monitoring program using this early warning tool. The preliminary findings of the research show that there are no major issues in water quality, though continuous monitoring for a full year is needed to ensure this is the case and there is a need to investigate traditional sources.

Aquatic Ecosystems in the Fort Good Hope Area as Indicators of Environmental Change CIMP - GNWT

Jérôme Comté also presented this CIMP project which seeks to identify aquatic ecosystem health in the context of climate change. The project is monitoring water microbial and chemical quality within Ts'udé Niljné Tuyeta and also near Fort Good Hope. It involves continuous monitoring systems in sentinel lakes (and will be added Loche Lake to this in 2021). It also seems to support water sampling capacity building by Guardians in Fort Good Hope. The preliminary findings in 2020 for Rabbitskin and Ramparts rivers showed normal water chemistry. In 2021 the Guardians samples have not yet been analyzed.

Contaminants Work in the Sahtu - Summary of ECCC work led by Marlene Evans

Marlene Evans summarized 3 pieces of research (both completed and current) that were relevant to the participants. The first was a CIMP project that looked at the effects of natural oil seepages and the operation at Norman Wells on the health of fish, including contaminant concentrations. This study concluded there were no large differences in fish along the MacKenzie River, whether close to Norman Wells or not.

The second looked at mercury concentrations in fish and how they vary across the Sahtu and found higher concentrations of mercury were associated with older fish in smaller lakes. The third piece of research examined mercury and contaminant trends in Great Bear Lake and trends in contamination in lake trout. This work is ongoing but preliminary results do not show any increase in mercury concentrations in lake trout and other contaminant levels are low.

Update from Sahtu Land and Water Board

Paul Dixon from the Sahtu Land and Water Board gave the COP an update on the status of Imperial Oil's Aquatic Effects Monitoring Program. Dixon summarized that the 3rd iteration of the program has yet to be approved. The Board conducted an independent review of the AEMP and concluded that there were areas of improvement and requested Imperial Oil address these concerns. In addition, Imperial Oil's annual reports as submitted to the Board have also been deemed insufficient and Imperial Oil is now revising them at the Board's request.

Historically, the AEMP was developed before 2015 when Imperial Oil applied for a water license. The Board found there was insufficient data at that time from independent and/or government sources and so the AEMP was developed to address this in addition to the establishment of working groups. To date this has been difficult to get off the ground due to lack of trust, transparency, funding and some capacity issues on engagement. The Board has also noted a lack of meaningful participation by Indigenous groups in the AEMP and a lack of incorporation of Indigenous Traditional Knowledge into the process.

Summary of Key Discussion Points and Recommendations

Key recommendations and observations from the Community of Practice from the Community include:

GNWT Community Based Monitoring:

- Ice Samples should be taken to understand year-round water chemistry, quality and trends
- The community expressed concerns that periodic releases by Imperial Oil into water systems may not be captured by the CBM based on timing and frequency of sampling

Lead Exposure

- Community members feel birds returning to the North from down south have been exposed to lead. They strongly encouraged the bird carcasses to be analyzed to confirm this.

Fish and Animal Health Observations

- Community members discussed how fish harvested this year in certain locations had unnaturally soft flesh, there was discussion as to whether this could be related to low fat content and/or water temperature.
- Other community members identified changes in the livers of Burbot over the past 20 or so years. 20 years ago burbot livers were rarely black, but this has been becoming more and more frequent now.

Water Quality in Changing Landscape

- Community members have seen lakes disappear (due to permafrost melting and the lake draining into this area) and seen lakes over methane gas. Encouraged research into this phenomenon, especially as methane affects fish habitat

Safe Drinking Water

- The community encourages researchers not just to sample water at treatment facilities but to sample it at point of consumption at multiple homes in Fort Good Hope. Community members reported water that was discoloured, dried up leaving dusty residue etc. Community members believe investigating whether pipes are the issue is important.

Barriers to Independent, Indigenous-led research

- Community members discussed the challenges of conducting research in a colonial system that still prioritizes western knowledge and science over Indigenous knowledge systems and ways of knowing. Barriers to true Indigenous driven research are difficult and it makes tracking data and recording by local people, independent of research institutes, very difficult.
- Researchers discussed different pools of funding available to fund Indigenous research and examples of other Indigenous communities developing their own databases. Work in Deline and the Deh Cho were referenced, as both areas are developing databases (and apps) to support observations of the land.

Imperial Oil's AEMP

- Imperial Oil should immediately release all of its data on PACs, including its findings on the chemical fingerprints of PACs that occur naturally near oil seeps and/or PACs due to human activity;
- Imperial Oil should measure PACs upstream and downstream of Norman Wells;
- A sediment sampling protocol should be developed for all 3 sampling locations;
- PACs should be measured in additional samples near and around Norman Wells: fish, soil, animal etc.;
- Imperial Oil and researchers should collaborate on learning more about natural oil seepages, their chemical fingerprint and how they change over time;
- Imperial Oil has data on seepages from the 40s, 50s, etc so this can be tracked and compared to current findings in the same locations;

Upcoming Research: 100 years of Imperial Oil

- There exists a prime opportunity for improved collaboration between Imperial Oil, the K'asho Got'ine and the Sahtu research community through a newly approved CIMP project that aims to examine the legacy of Imperial Oil's operations in the region through both a Western Scientific and Dene Traditional Knowledge lens. Entitled "A Century of Petroleum Extraction at Tłegóhłı (Norman Wells): Indigenous knowledge for Indigenous Guardianship" the project seeks to "explore the hundred-year history and impacts of petroleum extraction at Tłegóhłı through Indigenous eyes". Imperial Oil should collaborate fully with this research team, releasing all of its relevant data (both contemporary and historical) to support this process;

Conclusion and Next Steps

The inaugural meeting of the COP regarding water issues in K'asho Got'ine District came up with strong recommendations regarding improved industrial transparency, collaboration and specific recommendations around monitoring of key chemicals that research indicates are likely being released into the MacKenzie River at Norman Wells due to human industrial activity.

Yamoga Land Corporation will follow up with Imperial Oil, the Sahtu Land and Water Board and all relevant academic and community organizations to bring these recommendations forward with the ultimate objective of improving research outcomes, Industry-Community collaboration and stewardship of the local environment.

Appendix 1: Invited Researchers

Dr. Kirsty Gurney, Environment Canada & CIMP kirsty.gurney@canada.ca

Dr. Jennifer Baltzer, Wilfrid Laurier University, Canada Research Chair in Forests and Global Change, Global Water Futures jbaltzer@wlu.ca

Dr. Heidi Swanson, University of Waterloo, Global Water Futures heidi.swanson@uwaterloo.ca

Dr. Andrew Spring, Wilfrid Laurier University, Global Water Futures aspring@wlu.ca

Kristen Bill, Phd Student, Global Water Futures kbill@wlu.ca

Jordyn Stalwick, Research Assistant CIMP jordyn.stalwick@usask.ca

Dr. Colin McDonald, SRRB northern@granite.mb.ca

Dr. Jérôme Comté, L'Institut national de la recherche scientifique, CIMP Jerome.Comte@inrs.ca

Dr. Gary Stern, University of Manitoba, Northern Contaminants Program: unknown – never met/contacted gary.stern@dfo-mpo.gc.ca

Dr. Marlene Evans, Environment Canada marlene.evans@canada.ca

Dr. Mylène Ratelle, University of Waterloo mratelle@uwaterloo.ca

Dr. Kim Howland, Department of Fisheries and Oceans kimberly.howland@dfo-mpo.gc.ca

Gila Somers, Department of Environment and Natural Resources, GNWT Gila_Somers@gov.nt.ca

Dr. Alex Latta Associate Professor, Department of Global Studies; Department of Geography and Environmental Studies alatta@wlu.ca

Dr. Kelly Skinner, Assistant Professor, University of Waterloo, School of Public Health and Health Systems kskinner@uwaterloo.ca

Dr. Philippe Thomas, Wildlife Biologist at Environment Canada philippe.thomas@canada.ca

Leon Andrew, Research Director, Sahtu Renewable Resources Board, lamountaindene@theedge.ca

Appendix 2: Researchers - Confirmed Attendee List

1. Dr. Kirsty Gurney, Environment and Climate Change Canada & CIMP
2. Dr. Jennifer Baltzer, Wilfrid Laurier University, Canada Research Chair in Forests and Global Change, Global Water Futures jbaltzer@wlu.ca
3. Kristen Bill, Phd Student, Global Water Futures -
4. Jordyn Stalwick, Research Assistant Environment and Climate Change Canada
5. Dr. Colin McDonald, SRRB
6. Dr. Jérôme Comté, L'Institut national de la recherche scientifique, CIMP
7. Dr. Marlene Evans, Environment and Climate Change Canada
8. Gila Somers, Department of Environment and Natural Resources, GNWT
9. Dr. Kelly Skinner, Assistant Professor, University of Waterloo, School of Public Health and Health Systems
10. Dr. Alex Latta Associate Professor, Department of Global Studies; Department of Geography and Environmental Studies, Wilfred Laurier University

Appendix 3: K'asho Got'ine Attendees

K'asho Got'ine Community of Practice
June 14th, 2021
Attendance

Translation

Laura Tobac

Elders

Lucy Jackson

Wilfrid Jackson

Florence Barnaby

Sahtu Land and Water Board

Paul Dixon, President

Yamoga Board of Directors

Edwin Erutse, President

Roger Boniface

Anne Marie Jackson

Shawn Grandjambe

Renewable Resource Council

Daniel Jackson

Chief Danny Masuzumi

Elder

Vicki Orlias (also TMB)

Tuyeta Management Board

Lawrence Jackson

K'ahsho Got'ine Foundation

Montana T'Seleie King

Twyla Edgi Mazusumi

Joseph Tobac

John Tobac

Dr. Alexa Scully, Interim Executive Director

GNWT

Nigel Roussouw

Mitchell Shae

Appendix 4: PACs near and Around Norman Wells by Jordyn Stalwick

See attached PDF.