

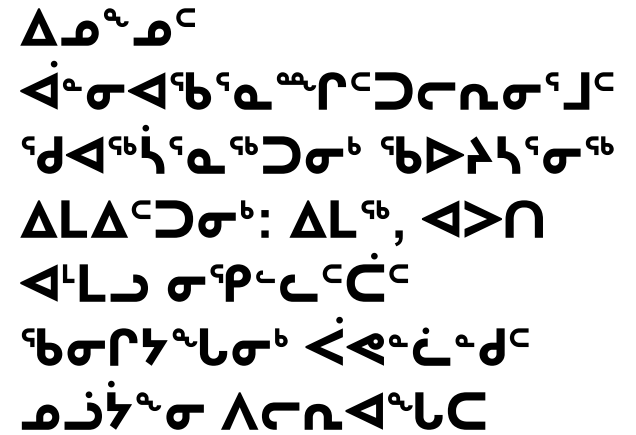
Proposed Field Work for April 2024



Google Earth



Appendix D Intrinsic Presentation



በኢሉ 5, 2024



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Prig Δ^a Dn^a P^b?

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- $\Delta^a \supset \Delta^a \rho^b \partial^c \wedge c n^{\epsilon} n \dot{\rho}^{\epsilon} r^c$.

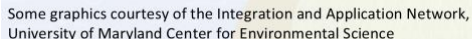
- [illegible]

- [illegible]

[illegible]

- $\sigma^{\epsilon} \rho^{\epsilon} \subset C \dot{C} \sigma^{\flat} \Delta_m \Delta^{\epsilon} \rightarrow \triangleleft^{\epsilon} \sigma \triangleleft^{\epsilon} b^{\epsilon} \subset \Delta \cap L \sigma^{\epsilon} \rho^{\epsilon} m^{\epsilon}$
 $\triangleright \cup n \triangleleft q p^{\epsilon} q^{\epsilon} \supset \sigma^{\flat} \epsilon \rho \Gamma^{\epsilon} \rho \sigma^{\epsilon}$
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မေ့, $\Delta L^c \Gamma$, $\Delta \sigma^{\dagger c} <^b C^c N^c \sigma$, $\sigma^{\dagger} \nabla N \sigma \Delta m^c \sigma^c \dots P^c L^c \dot{L}^c$

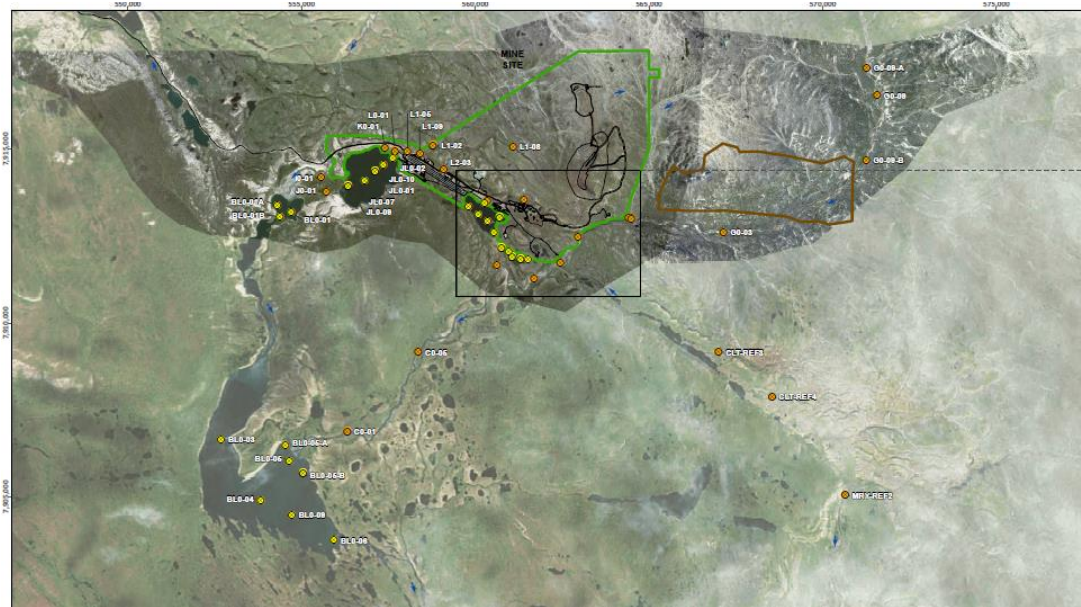


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2023 ልደገፍ ፍቴጋዝና ነጥብ ምድር ምድር

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L ⚡ ➤ C ...

◀▷ **በግፊት ምልክቶች አርዳኞች** **▷** **ረጅም ምልክቶች, ስለሆነውም ስለሰነድ**

$\Delta^{fb} d\dot{C}\sigma \Delta^L L \supset P^{su} J \Delta \sigma \supset C^b C^s \delta^u \Gamma \Delta \supset n$

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[illegible]
$$\Delta_{\mathbb{C}} \subset \mathbb{D} \cap \mathbb{L}^{\infty} \Gamma^{\mathbb{C}} \quad \text{is} \quad \mathbb{D} \cap \mathbb{L}^{\infty} \Gamma^{\mathbb{C}} \quad \Delta_{\mathbb{C}}^{\mathbb{C}} \quad \Delta_{\mathbb{C}}^{\mathbb{C}}$$

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- $\rho^{\text{adj}} \sigma \supset \mathcal{C}^{\text{adj}} \Delta^{\text{adj}} = 11$
- $\triangleright \rho^{\text{adj}} \sigma \supset \mathcal{C}^{\text{adj}} \Delta^{\text{adj}} = 10$
- $\triangleright \rho^{\text{adj}} \sigma \supset \mathcal{C}^{\text{adj}} \Delta^{\text{adj}} = 7$

L 79 C ...

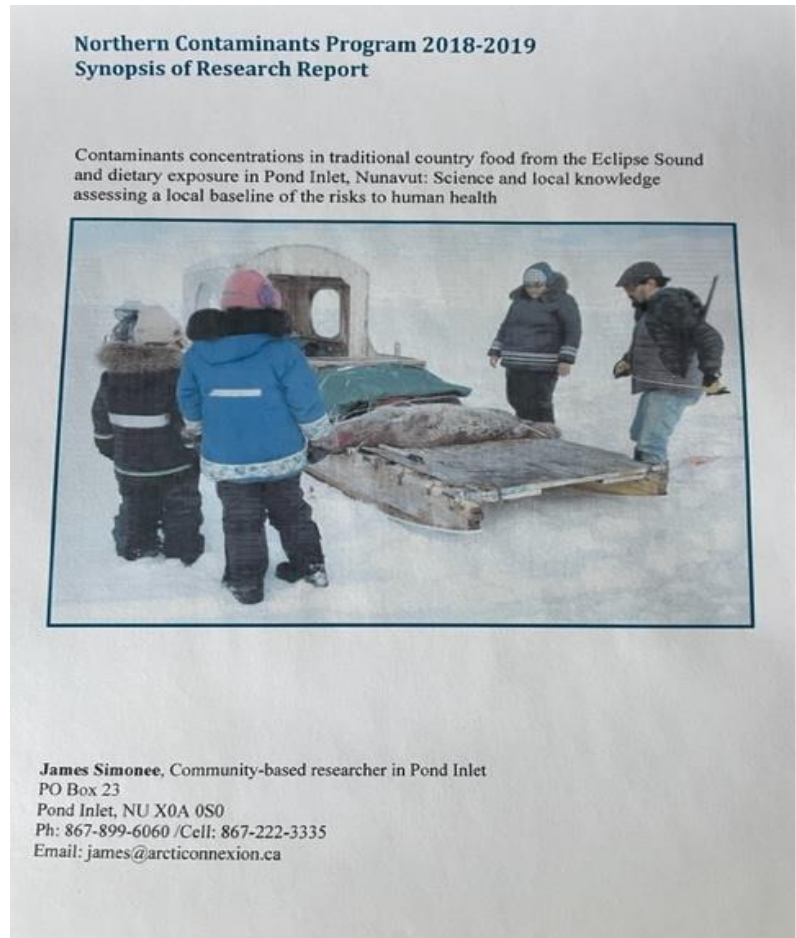
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- $\triangleright b c^{\text{qb}}$ ($n = 9$)
- $\triangleright^b \triangleright \Delta^c \dashv p^q r^c$ ($n = 88 - \Gamma 220 - J$)
- $\triangleright^b \triangleright \Delta^c \Delta \neg c^q r^c$ ($n = 43 - \Gamma 78 - J$)
- $\triangleleft^q p^l r^{\text{qb}}$ ($n = 46$)
- $C n \triangleright^q \Gamma \triangleright C^{\text{qb}} \Delta^{\text{qb}} \neg^b$
- $\Delta L^c \cap \triangleleft q^q \Gamma$ ($n = 69$)
- $C n \triangleright \Gamma$ ($n = 8$)
- $\dot{\neg} \dot{\neg}^c$ ($n = 11$)
- $a^c \dot{\neg}^c$
 - $\cap^q j \triangleleft \sigma$ ($n = 12 - \Gamma 26 - J$)
 - $\dashv p^q l \sigma$ ($n = 26$)

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ΔL^{9b} Δ^c C⁹ e⁹ r[<] ΔΓ⁹ J?



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- [illegible]

[illegible][illegible]

- [illegible]

[illegible]

-
- A person wearing an orange protective suit and black gloves is holding a white bucket lid. The lid has a yellow label with the text "MP 5503 C" and a smaller, less legible label below it. The bucket is filled with a white, granular substance, likely snow or ice. The background is a snowy, outdoor environment.

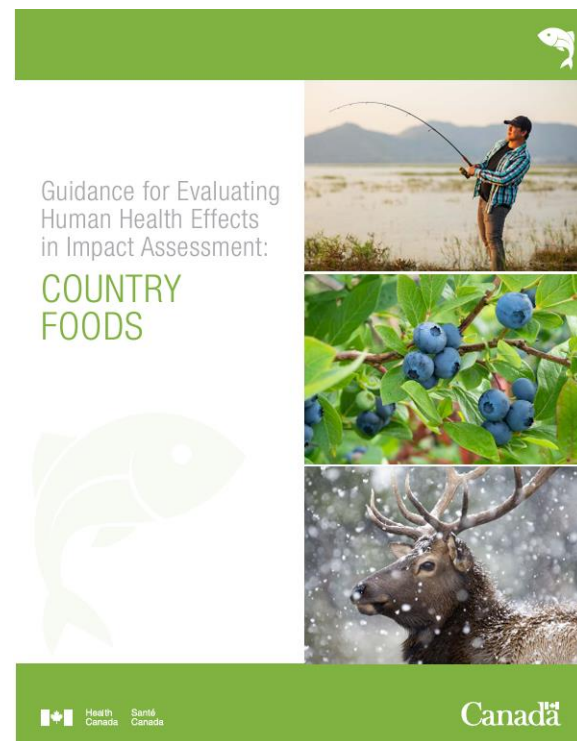
◁▷ ∩ Γ^c ◁ ▷^b <^c ∩ ◁ ↗^{a b} ◁^c C^b e^a ∩ <^c
 ᠨᠢᠴᠤᠨᠣᠷᠭᠡ?

- [illegible]

[illegible]

σ^ρρ^λλ^μμ^ν Δ^αΔ^βε^{μνρ}Γ^{αβγ} σ_{αβ}Γ^α?

- $\Delta \sigma \Delta^c \nabla^a \sigma \nabla^b \nabla^c \Delta \sigma \Delta^c \sigma^a \sigma^b \sigma^c$
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σ^qρ^cℓ^cĈ^c Δ^cĈ^qℓ^{q̃}Γ[<]Λ[̇]^c σ_ℓΓ^c?

- [illegible]

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- [illegible]


$$\Delta_{\mathcal{D}} \Delta^c \triangleleft^a \sigma \triangleleft^{fb} \mathbb{C} \Delta_{\mathcal{C}} \mathcal{L} \sigma^a \mathcal{P}^a_{\mathcal{D}} \mathcal{C}$$



Human Health Risk Assessment of:

Water, Snow and Country Foods near the Baffinland Mary River Project

Presentation to the Dust Audit Committee

December 5, 2024

Presented by: Bart Koppe, Intrinsik

Presentation Outline

- Background on Intrinsic (“who we are”)
- Objectives
- Information we relied on
- Key findings
- Monitoring programs

What is Intrinsic?

- Environmental and health consulting firm (independent of Baffinland)
 - Specialize in assessing the risks of chemical exposures to human health and the environment
- 40-year history
- Private, independent company with staff across Canada and the United States
- We have worked in all provinces and Territories of Canada, and internationally in many countries
- We work for industry, all levels of government, and Indigenous communities across the country

Who are we?

- Team of scientists, with three senior staff leading the assessments:
 - Each with 25+ years of experience assessing the risks to human health and the environment from different contaminants
- Intrinsic Team:
 - Christine Moore – experience in northern projects (including mining), environmental monitoring, human health and ecological risk assessment
 - Claire McAuley – experience working for Indigenous communities on country food assessments and reviewing mining projects for communities
 - Bart Koppe – experience working with Indigenous communities, northern projects, environmental monitoring, human health and ecological risk assessment, health impact assessment

What did Intrinsic do for Baffinland?

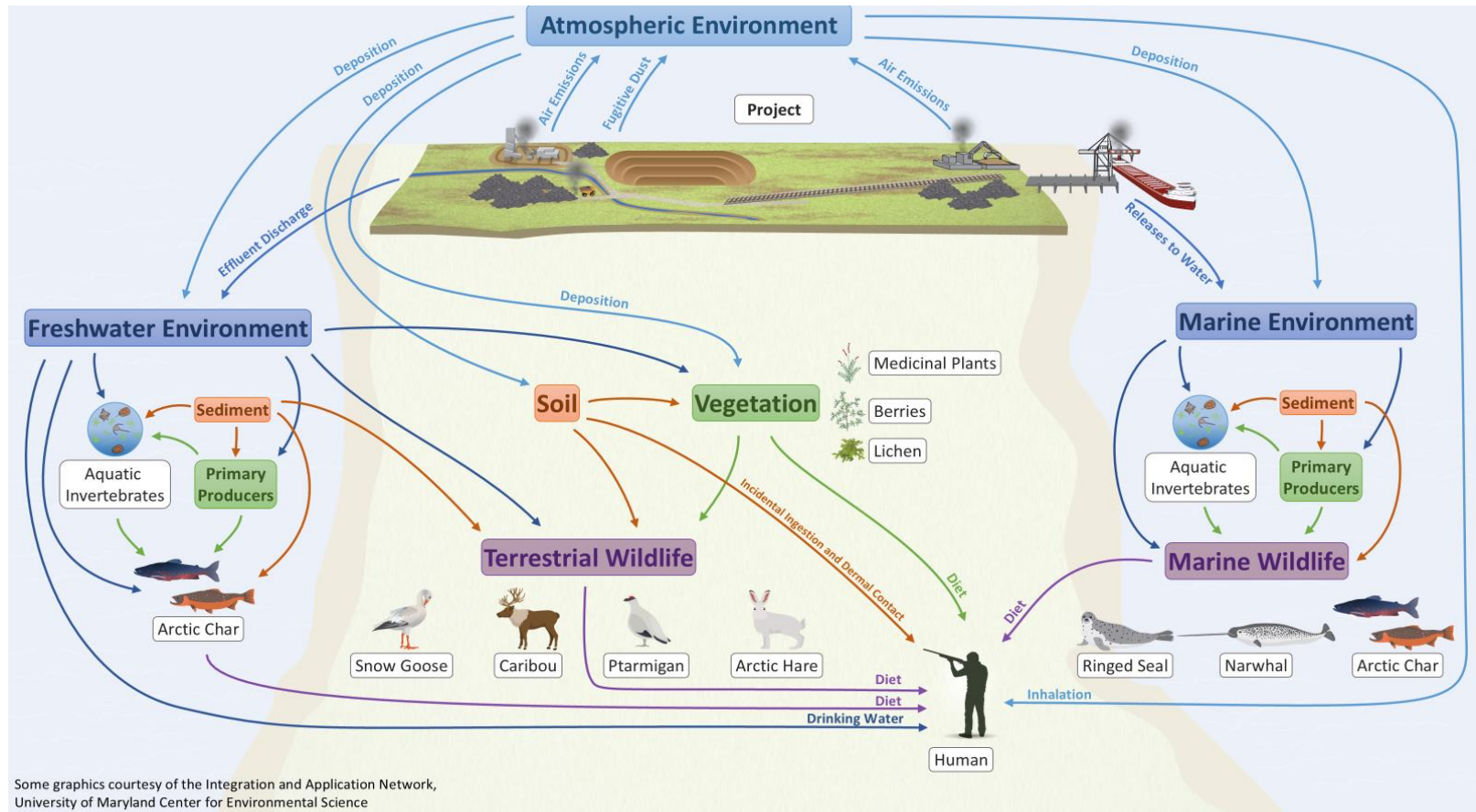
- Country Foods Human Health Risk Assessment
- Assessment of monitoring data, such as surface water data and snow meltwater data
- Review of scientific reports and studies

Objectives / Key Questions

- Is the lake water and snow meltwater safe to drink or use for tea?
- Are country foods safe to eat?

Interconnected Risk Model

Land, water, air, animals and people ... everything is connected

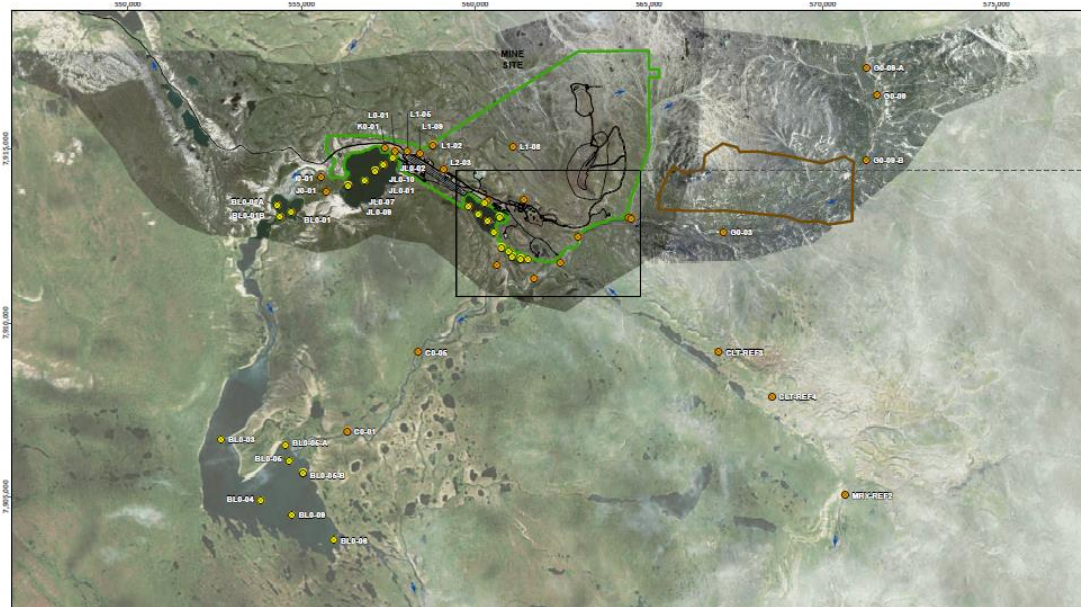


Some graphics courtesy of the Integration and Application Network,
University of Maryland Center for Environmental Science

What we sampled ...

Surface water quality monitoring data from areas close to and far away from the Mine.

Locations have been monitored since before the Project started.



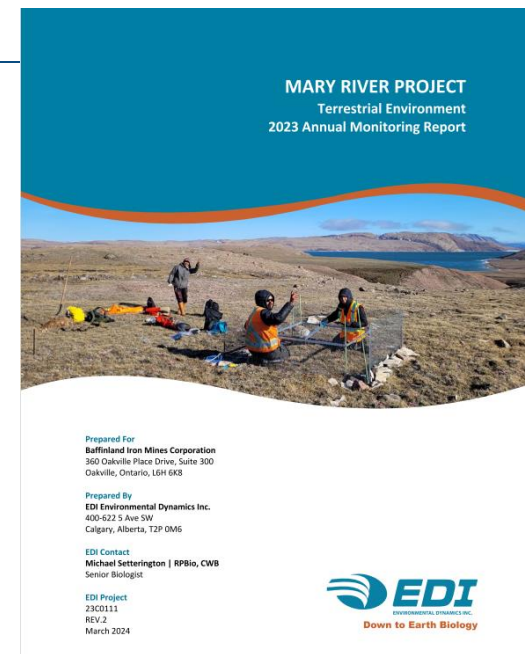
2023 Water Quality Data

- Camp Lake
- Mary Lake North
- Sheardown Lake North
- Mary River
- Tom River
- Tributaries
- Milne Port (raw intake water)

Total = 61 stations

What we sampled ...

Dustfall data from near and far sampling locations, as well as soil and lichen data



- Collected by EDI – Mine, Milne Port and Tote Road
- In 2023, 49 passive dustfall collectors
- Results from stations nearest to active operations were selected to characterize dust composition
- Deposition data used in exposure model

What we sampled ...

Snow samples from the Mine, Tote Road and Milne Port for the snow meltwater assessment



2023 program included the same locations as previous years, with the **additions** of a transect across Tote Road (5) and traditional use locations at the Mine Site (3) and Milne Port (5)

Also included reference sites

Sampling locations (totals):

- Milne Port = 11
- Mine = 10
- Tote Road = 7

What we sampled ...

Country Foods (muscle and organs)

Sources: Combination of scientific literature and shared report

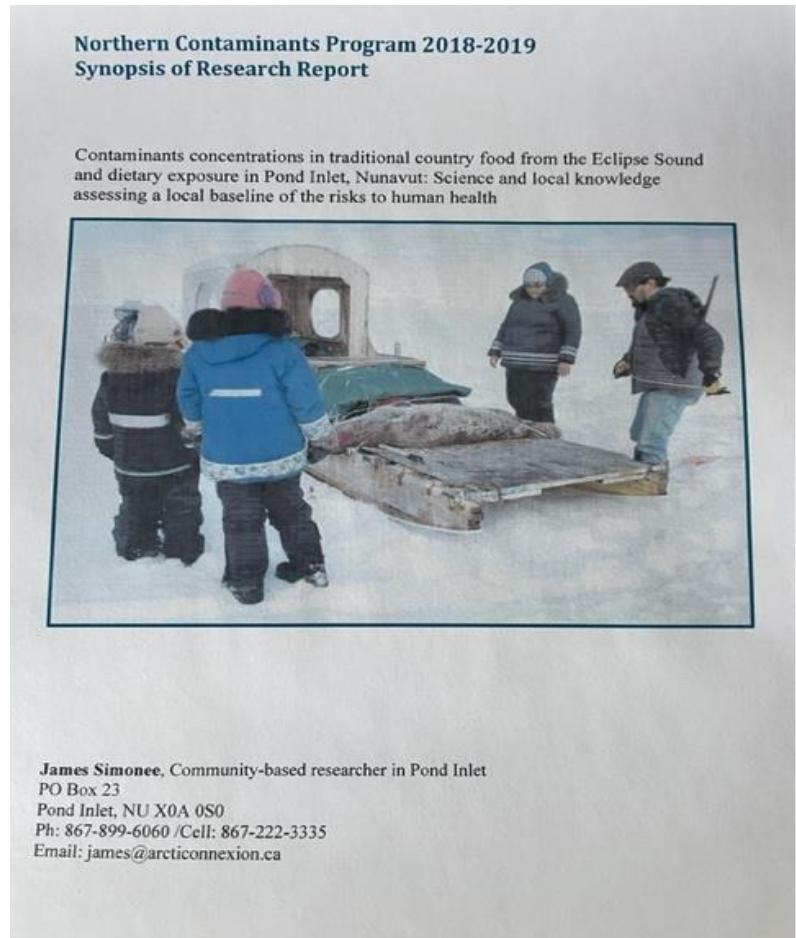


Sample sizes:

- Arctic hare (n = 9)
- Caribou muscle (n = range 88 to 220)
- Caribou organ (n = range 43 to 78)
- Ptarmigan (n = 46)
- Arctic char
 - Freshwater (n = 69)
 - Marine (n = 8)
- Narwhal (n = 11)
- Ringed seal
 - Liver (n = range 12 to 26)
 - Muscle (n = 26)

Other information we used ...

Community based sampling studies
and scientific publications



Is the water safe to drink?



Water concentrations were compared to Canadian Drinking Water Quality Guidelines:

- Maximum Allowable Concentrations (health-based)
- Aesthetic Objectives (odour and taste based)

Guidelines are based on continuous consumption (daily over a lifetime)

Findings:

- Water samples often did not have measurable concentrations of contaminants
 - More than half the contaminants were undetectable
 - Mercury was undetectable in all samples
- Of the 61 locations:
 - 7 had water samples that could have a different taste or colour (iron)
 - 2 had water samples with concentrations higher than the MAC Guideline
- Health risks are very low

Results of snow meltwater sampling ...

- Compared to Canadian Drinking Water Guidelines
- Most of the parameters were below Guidelines
 - Milne Port = 18/22
 - Mine Site = 18/22
 - Tote Road = 19/22
- Occasional exceedances of health-based guidelines in locations close to the Mine site, Milne Port and Tote Road
 - Milne Port = 1 location (aluminum)
 - Mine Site = none
 - Tote Road = 2 locations (aluminum and manganese)
- Occasional exceedances of the aesthetic objectives at the same locations
 - Milne Port = 4 locations (aluminum, manganese and iron)
 - Mine Site = 2 locations (aluminum, manganese and iron)



Is snow meltwater safe for tea?

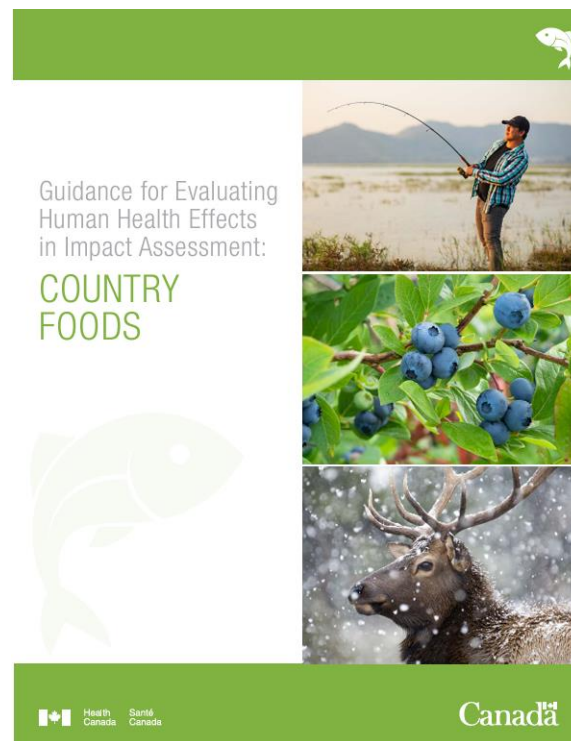
- Snow samples from inside the operational areas at Milne Port and the Mine Site had higher concentrations (compared to locations further away)
- For Tote Road, concentrations of metals were highest in samples collected closest to the road.
- All the traditional use locations added in 2023 had concentrations below health-based guidelines

Yes, the snow water is safe to use for tea.



Are country foods safe to eat?

- Human health risk assessment followed Health Canada guidance
- Combination of measured data and modelled data
- Focus was on the potential changes associated with dust
- Findings were consistent with results and conclusions from other researchers in the region

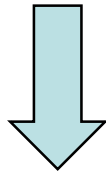


Are country foods safe to eat?

- Country foods are an important and safe source of nutrients in North Baffin Island
- Some risks are higher for people who eat organs or meats of certain animals, but this is **not related to Project dust**:
 - Caribou organs (cadmium)
 - Seal liver (mercury / cadmium)
 - Narwhal (mercury)
- Mercury is not associated with dust from the Mine. Mercury is a global pollutant which comes to the Arctic through long range air transport, as well as naturally occurring sources.
- Cadmium is also naturally occurring in rocks, and is commonly found in organ meats across the country. The assessment indicates contributions from mine dust are very small.

Next Steps – Monitoring Programs

- Terrestrial monitoring program (soil, lichen, dustfall)
- Marine monitoring program (sediment, surface water, fish)
- Freshwater monitoring program (surface water)
- Snow meltwater monitoring program
- Fish health monitoring program (pending collaboration with community)



Human Health