SUBMISSION TO THE

NUNAVUT WILDLIFE MANAGEMENT BOARD

FOR

Information: **Decision: X**

Issue: Review of Nunavut Wildlife Studies Fund application #206-16-01 "Metal related oxidative stress and DNA damage in ringed seal population from the Strathcona Sound (Arctic Bay, Nunavut)"

Background:

At the Nunavut Wildlife Management Board's (NWMB or Board) March In-Camera meeting (IC 003-2016) the Board reviewed a Nunavut Wildlife Studies Fund application from Solomon Amuno with the Nunavut Impact Review Board titled "Metal related oxidative stress and DNA damage in ringed seal population from the Strathcona Sound (Arctic Bay, Nunavut)". The applicant requested $30,000 in single year funding[1].The objective of this study is to compare contaminant loads and health issues in ringed seals near the former Nanisivik mine, with those farther away from the site, to determine if significant differences exist between the two groups. The results from this project may be used to provide information on the effects of accumulated heavy metals on ringed seals exposed to mining wastes in Nunavut, including stress and disease susceptibility. As well, the results will inform community choice of traditional country food harvested, especially in areas affected by historical mining activities. Appendix 1 includes a more detailed overview of the project design, score and budget.

Overview:

During the NWMB's review of this proposal, the Board agreed that they supported the goal and objectives of this research, but needed clarification on some sections of the application before making a funding decision. Specifically, the Board asked for further details on the following: 1) hunter compensation for the collection of seals; 2) incorporation of Inuit Qaujimajatuqangit in the research design; 3) hunter involvement in sample collection, including training, capacity building and compensation; and 4) consultation with other organizations such as Fisheries and Oceans Canada and the Northern Contaminants Program (Appendix 2). On March 30th, 2016, the applicant sent a reply to the Board's questions, which are included as Appendix 3. The applicant

[1] The Board approved $100,000 for 2016-2017 Nunavut Wildlife Studies Fund applications, of which $40,000 has been allocated. Therefore, there is $60,000 remaining for additional 2016-2017 projects.

informed the Board that after consulting with the Arctic Bay Hunters and Trappers Organization, it was agreed that hunters will be paid $50-$60 per seal. In addition, participating hunters will be involved in sample collection and receive training on research protocols for biological sampling and tissue storage. The applicant has been collecting Inuit Qaujimajatuqangit on ringed seal health near the former mine site through documented research, as well as through interviews with hunters and elders. Finally, the applicant has consulted with other departments and organizations on the project design and funding opportunities, and has received positive feedback from the Government of Nunavut and Fisheries and Oceans Canada on the type of data that would be generated from the project.

Prepared by: Karla Letto, Wildlife Management Biologist
Consultations: Danica Crystal, Wildlife Management Biologist
Date: May 3rd, 2016

PROPOSAL REVIEW

Project Number: 206-16-01 **Applicant:** Solomon Amuno

Organization: Nunavut Impact Review Board

Title: Metal related oxidative stress and DNA damage in ringed seal population from the Strathcona Sound (Arctic Bay, Nunavut)

Funding Requested: $30,000[1]

Total Score 56.5/100
(0 points deducted)

Scoring Breakdown: NWMB Priority: 4.5 / 7.5
Regional Priority: 17.5 / 17.5
Quality: 16.5 / 35.0
Consultation: 12.0 / 15.0
Funding: 6.0 / 25.0

Project Summary: The marine environment of the Strathcona Sound represents an important seal hunting and fishing area for harvesters from Arctic Bay, and has been historically exposed to a mixture of contaminants due to historical lead-zinc mining, and operations of a marine shipping terminal north of the mine site. Prior to the closure of the Nanisivik mine in 2003, and following decommissioning of the mine in 2006, Inuit engaged in hunting and fishing activities around the Strathcona sound have expressed concerns about rapid ringed seal population declines, and health issues related to contaminants. This project will attempt to answer the following research questions:

1) Do ringed seals from the Strathcona Sound carry a higher burden of heavy metals compared to seals from control sites?
2) To what extent have metal-related stresses, including damage to lipids, DNA and proteins, occurred in ringed seals from the Strathcona Sound compared to seals from control sites?
3) Do ringed seals in Strathcona Sound have a decreased resistance to parasites and disease as a result of exposure to metals compared to seals from control sites?

Project Contributions:

Requested from NWMB	$ 30,000	100%
Other Contributions[2]	$0.00	0%
Total	**$30,000**	**100%**

Budget:

Item	Funds ($)
Total Metals analysis	$10,500

[1] The Board approved $100,000 for 2016-2017 Nunavut Wildlife Studies Fund applications.
[2] Although the project does not include financial contributions from other sources, proposal includes in-kind support from lead researcher, secondary researcher and Arctic Bay Hunters and Trappers Organization.

(210 samples x $50 per sample)		
Enzyme tests		$4,800
Histopathological (disease) Assessment		$2,382
Lab Technician Salary		$3000
Round trip to Arctic Bay (Cambridge Bay-Arctic Bay) for 1-2 days		$8000
Truck Rental to Nanisivik mine site/Strathcona Sound		$2000
	TOTAL	**$30,682**[3]

NWMB Staff Evaluation:

NWMB Priority: #4 – Contributes to the provision of advice regarding the Nunavut Settlement Area's marine areas and proposed decisions which would affect those marine areas.

Regional Priority: #1 Qikiqtaaluk – Marine mammals: examine the increase in health issues/diseases (for example, causes).

Project design: This study will compare contaminant loads in ringed seals near the former mining area, with those farther away from the site, to determine if significant differences exist between the two groups. This project will be conducted in two areas: 1) the Strathcona Sound near the former Nanisivik mine, and 2) a relatively uncontaminated area (control site) within Admiralty Inlet 50-75 km from the mine area. The Ikajutit Hunters and Trappers Organization in Arctic Bay will harvest 30 ringed seals for the study. The weight, length and gender of each animal will be recorded and blood samples will be collected from each animal and stored in prepared vials. Each animal will be dissected for the removal of target organs, such as kidney, liver, testicles and fatty tissues. Samples will be stored and shipped to labs at the University of Saskatchewan and Guelph University for analysis.

Application of results: The results from this project may be used to provide information on the effects of accumulated heavy metals on ringed seals exposed to mining wastes in Nunavut, including stress and disease susceptibility. As well, the results will inform community choice of traditional country food harvested, especially in areas affected by historical mining activities.

Community involvement / consultation: The Arctic Bay Hunters and Trappers Organization has reviewed the project proposal and has provided its support (appendix 1). The application states that the lead researcher will pay the hunters for the ringed seals, but does not include details on payment amount. The results of the project will be shared with the community in the form of a community report.

Prepared By: Karla Letto, Wildlife Management Biologist, NWMB
Consultations: Danica Crystal, Wildlife Management Biologist, NWMB

[3] Application does not provide details on how the researcher will cover the remaining $682.00 in the budget.

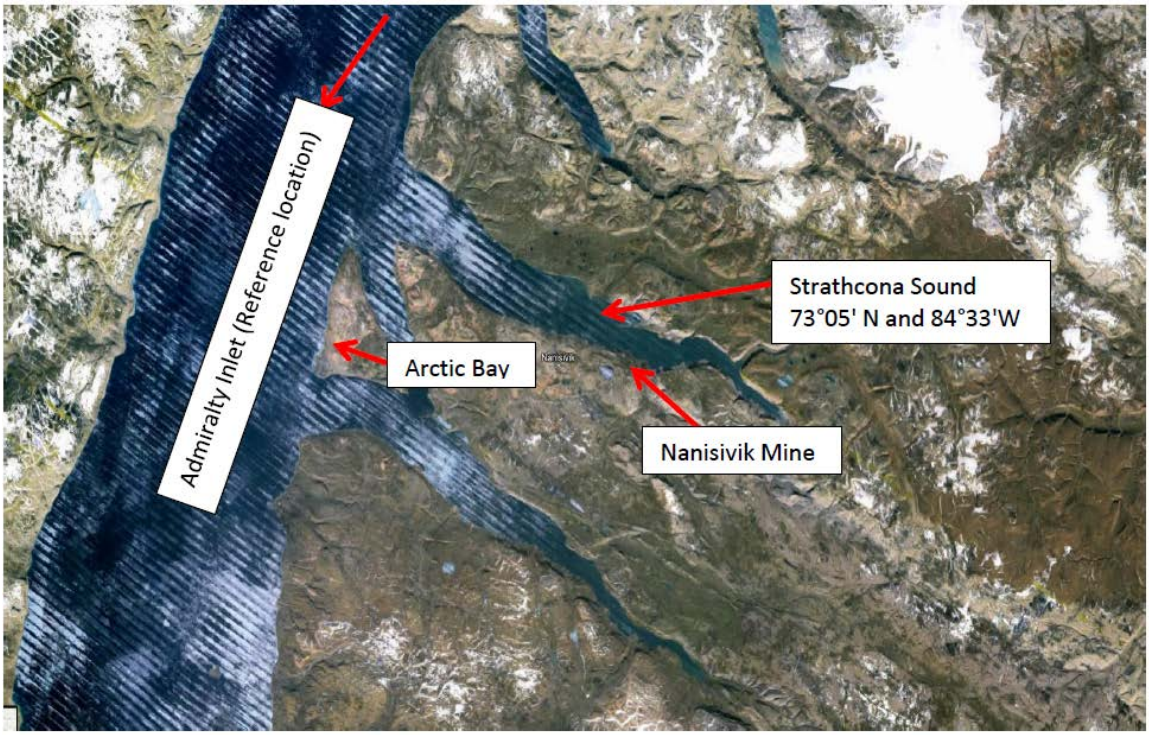

Figure 1. Study area.

www.nwmb.com

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Nunavut Wildlife Management Board

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Tammaqtailinahuarniriit anngutighat atuqhugit Inuit qaujimajatuqangillu ilihimaniillu ilitquhiannin
Conserving wildlife through the application of Inuit Qaujimajatuqangit and scientific knowledge

March 24th, 2016

Solomon Amuno
Technical Advisor
Nunavut Impact Review Board

Re: Nunavut Wildlife Studies Fund project #206-16-01 "Metal Related Oxidative Stress and DNA Damage in Ringed Seal Population from Strathcona Sound"

Dear Mr. Amuno:

The Nunavut Wildlife Management Board (NWMB or Board) conducted its review of your Nunavut Wildlife Studies Fund (NWSF) application titled "Metal Related Oxidative Stress and DNA Damage in Ringed Seal Population from Strathcona Sound" (NWSF project #206-16-01) at its March Regular meeting on March 15th, 2016 in Iqaluit, Nunavut. Overall, the NWMB supported the goal and objectives of this research. However, the NWMB would like to get clarification on some sections of your application before making a funding decision. Specifically, the NWMB would like clarification on the following:

1. Will hunter(s) be compensated for the collection of seals? If yes, what will the hunter(s) be paid per seal?
2. How will your project design incorporate Inuit Qaujimajatuqangit and/or Traditional Ecological Knowledge?
3. Will hunter(s) be involved in sample (i.e., blood, organ and tissue) collection? If yes, please provide details on training, capacity building and compensation.
4. Have you consulted with other departments and organizations, such as Fisheries and Oceans Canada, Government of Nunavut – Department of Environment, Fisheries and Sealing Division, and the Northern Contaminants Program, on the project design and potential for collaboration?

Thank you for your interest in the Nunavut Wildlife Studies Fund. The NWMB looks forward to receiving your response to these points of clarification. Once received, the NWMB will once again review your application and make a funding decision during its next Board meeting.

If you have any questions or concerns with the contents of this letter, please do not hesitate to contact the NWMB.

Sincerely,

Peter Kydd
Director of Wildlife Management
Nunavut Wildlife Management Board

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1. **Will Hunter(s) be compensated for the collection of seals? If yes, what will hunters be paid per seal?**

Yes, participating Inuit hunters will be compensated for the collection of seals for the research. However, during our consultation with the HTO chairperson (Jobbie Attitaq) in November/December 2015, we agreed that each hunter will be paid between $50-$60 per seal captured from the selected area.

2. **How will your project design incorporate Inuit Qaujimajatuqangit (IQ) and or traditional ecological knowledge?**

We anticipate incorporating IQ at each phase of the research project, particularly during field sampling program in order to inform where exactly to sample ringed seals population in relation to impacts from the former mine site. During the drafting of the research project, and prior to the submission of our proposal to the NWMB, our research team had specifically collected IQ through archival studies/locally documented research, as well as and through interview with the HTO and elders. We sought traditional information related to ringed seal health proximal to the Nanisivik mine/Strathcona Sound. The following summarizes the traditional ecological knowledge obtained:

- The Strathcona Sound continues to be an important seal hunting and fishing area for Arctic Bay Inuit, but this area has been historically exposed to complex mixture of contaminants due to historical lead-zinc mining and operations of a marine shipping terminal north of the mine site
- Hunters have observed rapid declines, and deteriorating health conditions of ringed seals inhabiting the Strathcona sound, and further observed severe hepatic tissue alteration and impairments
- Hunters are still unsure whether seals captured near the former mine site are safe for human consumption due to potential for heavy metal bioaccumulation

3. **Will hunters be involved in sample (blood, organ and tissue) collection? If yes, please provide details on training, capacity building and compensation.**

The HTO will be assisting us in selecting participating hunters for the ringed seal sampling program. Prior to sampling, we will be organizing by teleconference basic training sessions for all participating hunters, and will provide training in research protocols for biological sampling, and tissue storage. In addition, we will be providing an interactive, step-by-step guidance notes to help participating hunters during sample collection and tissue storage. We will be providing financial compensation of up to $60 for each ringed seal, and tissue sample collected.

4. **Have you consulted with other department and organisations, such as fisheries and ocean Canada, Government of Nunavut-Department of Environment, Fisheries and sealing Division, and Northern Contaminant Program on the Project design and potential for collaboration?**

Prior to the submission of our research proposal to the NWMB, our research team had initially consulted Nunavut Tungavik Inc (NTI), Polar Knowledge (Canadian High Arctic Research Station) including indigenous Affairs and Northern Canada (Northern

Contaminant Program) in early 2015 to discuss avenues for potential funding and research collaboration with experts on this project. However, the feedback we received jointly from NTI/NCP was that they typically fund research projects focused on long-range contaminants effects on wildlife, and that our proposed study only focused on localized contaminants from a legacy mine, and as such did not meet the criteria for NCP funding. In addition, Polar Knowledge indicated that they are not able to fund marine wildlife research due to their focus on other priority research areas. While the GN and DFO was contacted with respect to the research project, however, their staff further expressed interest in the type of data that would be generated from the study, but no funding opportunities was made available or financial commitment from these agencies to support the research at Nanisivik.