

Replies to the NIRB permit comments:

First of all, we would like to express our deep gratitude for your review of this permit application and the comments made on our proposal. As the comments were provided by multiple stakeholders, we drew up a list of them and added our reply to each comment as below.

Apiusie Apak (Chairman)- Nangamautaq Hunters & Trappers Association

COMMENT:

- ... Activities take place at a time and in an area of narwhal hunting for the community.
- ... Ensure this activity does not create any concerns for our hunters (fuel drops).
- ... Ship moving back and forth between Scott Inlet and Clyde River.
- ... Ensure there are no concerns about hunting activities closer to the community.

REPLY:

Our aim is to avoid any hunting activities.

We will communicate with the Clyde River community to aim to avoid the areas and periods of narwhal hunting for the community.

Our aim is to stay on the ship/boat for the entire period of our research activities. However, if the weather is bad, the ship/boat may have to shelter in Scott Inlet or nearby.

Felexce Ngwa (manager, impact assessment)

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)

COMMENT:

1. Potential for positive effects to Inuit through employment, training & procurement opportunities... Clyde River should be prioritized in any project-related employment, training and procurement opportunities that may be made available.
2. Consultation with Interested parties
 - a. Hamlet of Clyde River
 - b. Clyde River Hunters and Trappers Organization

REPLY:

We have budgeted a small amount of funding in our project to support personnel of Clyde River who can be invited to participate our project. We have also been trying to recruit a PhD student from one of the Inuit communities. We have funded a Clyde River person for translation of our summary to Inuktitut.

Rick Kiriluk (DFO) - Rick.Kiriluk@dfo-mpo.gc.ca (905-336-4560)

COMMENT:

The Fisheries Act protects all marine mammals under the provisions of the Marine Mammal Regulations of the Act, which prohibits the disturbance of a marine mammal. The minimum distance requirements are in place to ensure marine mammals are not disturbed or harmed inadvertently while watching marine wildlife (<https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/watching-observation/index-eng.html>).

When your proposed activities cannot follow the minimum distance requirements, the Minister of Fisheries and Oceans may issue an authorization to disturb a marine mammal in some circumstances under the Marine Mammal Regulations. If your activity constitutes disturbance as defined by the Marine Mammal Regulations, you need to apply for authorization to disturb a marine mammal. The application form and further application instructions can be found at <https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/section38/index-eng.html>. Applications related to the production of audio-visual records should be submitted to NT-NUpermit@dfo-mpo.gc.ca at least 30 days before the proposed start date.

REPLY:

We have referred to: <https://laws-lois.justice.gc.ca/eng/regulations/sor-93-56/index.html> Marine Mammal Regulations (SOR/93-56) - Part V (Section 38) which defines marine mammal disturbances.

We shall not conduct any disturbing activities as stated in Section 7 and 7.2.

With the cruise speed of our underwater vehicle, 1.5m/s, at the approximate depth of AUV operations of 100m or more, the AUV has a low likelihood of causing disturbances or impediments to the path of marine mammals (Section 38.2.e). The AUV is a very quietly operating vehicle as it uses electrical power from batteries.

We expect the outcomes of our activities will contribute to strengthen our knowledge of oil-in-water which could form a base for future marine scientific research (Section 38.1.e)

In compliance with the Section 39 of the Regulations, our skipper/vessel operator will follow the protocols required in terms of any accidental contact between our support vessel and a marine mammal.

In particular, the skipper of the vessel will notify the Minister of Justice:

- (a) the date, time and location of the incident;
- (b) the species of marine mammal involved in the incident;
- (c) the circumstances of the incident;
- (d) the size and type of vehicle and, if applicable, the type of fishing gear involved in the incident;
- (e) the weather and sea conditions at the time of the incident;
- (f) the observed state of the marine mammal after the incident; and
- (g) the direction of travel of the marine mammal after the incident, to the extent that it can be determined.

Alan Cormack (Mayor of the Municipality of Clyde River)

The Nammautaq HTO, Hamlet of Clyde River, and Ittaq Heritage and Research Centre

COMMENT:

We request that this application be resubmitted after the following points are addressed in order to provide more complete information to the community.

1. ... It is important to know which ship is being used as it has an impact on noise, operations, and other factors.
2. ... depending on which ship is used, there would be other activities that happen on board at the same time, specifically the Students on Ice (SOI) program ... we need to understand what other activities are happening from the ship during this time period, and where, in order to properly assess the application.
3. ... the proponent has indicated that they will visit the community August 22-24, 2022. This is an opportunity for the public to be informed about the project through public presentations and radio show...

... In addition to the above, we also request information on the following questions:

4. The project will be collecting information about oil deposits in the area and this information will be part of project results and publications... What are the risks of this information being accessed and used by oil or other companies who might use it for oil exploitation purposes? ... What if other companies with other intentions use the information? How can this be mitigated?
5. The project includes operation of underwater UAVs. What plans are in place in the event that a UAV is lost in the water due to damage, malfunction, etc.?

REPLY:

1. The vessel we're considering to use is either the M/V Patrick and William (32m fishing vessel from Newfoundland) or the R/V Sanna (32m research vessel from Nuuk). We have been in contact with the Nunavut Government about use of the M/V Nuliajuk, but this vessel is very small for our purposes and would need a custom handling system for the larger AUV. The final decision is dependent on an additional funding application which will add to funding we have already secured.

The purpose of the support vessel in our activities is:

- As a base to prepare our autonomous underwater vehicles (AUV) for deployment/ missions
 - The launch and recovery of the AUVs
 - To accommodate the research personnel
 - To house the AUVs when they are not in use
2. An original aim was to collaborate with Students on Ice, but this is no longer an option for us as our two missions do not coordinate well with each other. As a result, we will be using a smaller ship/vessel to support our mission.
 3. Dr. Neil Bose, who is the Principal Investigator of the project, is planning to give a presentation in

Clyde River which outlines the overall project and activities; and he is more than happy to participate in a radio show to receive and answer questions from the public.

4. The exact details of oil deposit locations, including any GPS coordinates, will not be disclosed. This will limit any possible oil exploitation by oil and gas, or other companies in the future.

5. Explorer AUV is equipped with extensive safety systems in case of difficulty or loss including: The AUV has two bottom avoidance sonars (altimeter: Kongsberg Simrad Mesotech 1007 Digital and a Doppler Velocity Log, DVL). These enable the vehicle to avoid obstacles on the seafloor and to maintain a minimum distance from the seafloor in operation. The DVL also updates the accuracy of the AUV's navigation by calculating drift of the AUV relative to the seabed.

The AUV is fitted with GPS that updates the position (GPS coordinates) of the vehicle every time the vehicle comes to surface.

The AUV is also equipped with an emergency satellite beacon (ARGOS) which runs on an independent battery power system and reports the position of the vehicle via satellite to the operators on the ship. This beacon provides location of the vehicle should all other systems on the AUV fail such that it can be located and retrieved.

A ballast test and pre-dive checks are always conducted prior to deployment/ operation. The vehicle maintains a positively buoyant state via this ballast test which returns the vehicle to the surface should the power systems fail; and any malfunctions are pre-detected through pre-dive checks to ensure the vehicle is ready for diving. Post-dive tests are also done after each dive.

While the AUV is submerged during the mission, the onboard fault management system continuously monitors and logs any faults. If critical faults occur, the immediate actions are triggered in accordance with the appropriate fault response table which is carefully set by the operation team before each mission.

In case the vehicle becomes stuck in a fresh water layer the water column or sinks to the seabed, a drop-weight fitted on the bottom side of the vehicle automatically releases to give extra buoyancy to force the vehicle to the surface.

In the event of a critical failure of the above safety systems, such as the extremely unlikely case where the main pressure vessel collapses, a USBL beacon (Sonardyne Ranger2), which also runs on an independent battery, enables the operators on the ship to find position of the AUV if stuck at depth.

Once the vehicle is on the surface, the support ship can get close to the AUV and recover it. If the AUV does not surface for some reasons, if it is entangled for example, a remotely controlled vehicle (ROV) can be sent down to the depth/location where the AUV is stuck then assist in releasing the AUV.

This multi-layered safety system is embedded into the AUV to prevent any damage or malfunction as well as to prevent any potential impact from loss of the vehicle. The AUV is a scientific asset worth approximately 7 million dollars.

The glider AUV is a simpler system. It also is fitted with GPS and a satellite beacon which can be used for emergencies. It is also fitted with a USBL and underwater acoustic communication system. It is designed to be operated remotely for extended periods of up to several weeks duration at which time it is located by satellite and retrieved by a surface ship/vessel.