

July 14, 2020

Mayor and Council  
Hamlet of Arctic Bay  
Box 150  
Arctic Bay NU X0A 0A0

Re: Parks Canada proposal for a three year pilot Underwater Noise Baseline Study

Dear Mayor Oyukuluk and Councillors

Parks Canada, with guidance from the Canada-Inuit Aulattiqatigiit Board which is responsible for the management of Tallurutiup Imanga National Marine Conservation Area (TINMCA), would like to begin a three year pilot project (2020 to 2022) to deploy up to four hydrophones in the marine environment around Arctic Bay. The hydrophones, which would be deployed at the beginning of the open water season and recovered at the end of it, would focus on capturing background and human generated noise in the ocean, and how that changes over the years. With TINMCA Inuit Impact and Benefit Agreement implementation underway, this work would contribute to better understanding human generated noise and its effects on marine life and ocean health within the NMCA. This pilot underwater noise study is consistent with similar studies done in the Arctic (e.g. around Pond Inlet) and in Canada. It is expected that the result of this study would contribute to the overall understanding of the impact of human generated noise on marine wildlife. Once the data is analyzed, the results will be shared with the Hunter and Trapper Organization of Arctic Bay, the Hamlet, and the community at large.

This year offers a special opportunity to understand how quiet the ocean is, as vessel traffic is expected to be down significantly with restrictions on vessels, mandated by the Covid-19 virus pandemic.

Hydrophones are underwater microphones and digital recorders deployed at a depth of less than 30 metres. Details of their use and deployment can be found in Appendix 1 at the end of this letter. However, it is important to know that these devices record sound, they do not make sound. They are passive and remain in one spot. Further, surface floats to which the hydrophones are attached are small vinyl floats that will not cause damage to boats and create no risk to wildlife. This technology, although relatively new, is in place throughout the Arctic and the rest of Canada and has been used by government and universities. These recorders will gather the noise of the seascape (the background noise that always exists), and any human made noise generated in the ocean.

Based on conversations with the Qikiqtani Inuit Association's Nauttiguqtiit (Inuit Stewards) from Arctic Bay, and our objective to collect data from different types of areas (e.g. with vessel traffic, quiet, important areas), general locations we are considering are:

1. Strathcona Sound, to gather data on the approaches vessels take to Nanisivik;
2. Adam's Sound, to gather data at the approaches vessels would take to Arctic Bay;
3. In the lower reaches of Admiralty Inlet, around or near Yeoman Island, to gather baseline data in an area that sees less large vessel traffic; and

4. Admiralty Inlet in the area of Kakiak, as it is an important hunting area, and data could be gathered on any large vessel traffic and its effect on marine life. Recognizing the sensitivity of this area, this hydrophone could be deployed at an alternate location if suggested by the community.

Pending the outcomes of the consultation and permitting processes, Parks Canada has received the conditional support from the Aulattiqatigiit Board (copied), the co-management board responsible for the management of TINMCA with representation from QIA, Parks Canada, Transport Canada and the Department of Fisheries and Oceans Canada. The Nauttisuqtiit of Arctic Bay may also contribute to the deployment, maintenance and recovery of the hydrophones.

Parks Canada would follow proper Covid-19 precautions during the work in accordance with the guidance of the Government of Nunavut's public health officer, including social distancing and the use of personal protective equipment, and work with our partners in following those guidelines. Further, it is important to note that for this year's open water season from August to November only people from Arctic Bay will be involved, with no one traveling from outside Nunavut.

The summary of the project, along with a map of the general areas and additional relevant information, is attached to this letter.

We are seeking guidance from the Hamlet of Arctic Bay regarding this proposed pilot project, including, its value to the community. We would appreciate your feedback by the 13<sup>th</sup> of August 2020. Meanwhile, Clare Kines, Parks Canada's project lead will follow up directly with you, or you can contact him at (867)324-0124, by email at [clare.kines@canada.ca](mailto:clare.kines@canada.ca), or by mail at Box 73, Arctic Bay, NU X0A 0A0.

Thank you, sincerely,

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CC:

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Joel Ingram  
Manager, Marine Planning and Conservation, Central and Arctic Region  
Department of Fisheries and Oceans

## Appendix 1

This proposal is a three year pilot research project designed to begin establishing baseline data on underwater noise, within Tallurutiup Imanga National Marine Conservation Area (TINMCA). TINMCA is currently in the establishment phase but has been operating since the signing of an Inuit Impact Benefit Agreement in August 2019. The pilot project will involve deploying four hydrophones in strategic spots within TINMCA in the area of Arctic Bay. this work would contribute to better understanding human generated noise and its effects on marine life and ocean health within the NMCA. This pilot underwater noise study is consistent with similar studies done in the Arctic (e.g. around Pond Inlet) and in Canada. It is expected that the result of this study would contribute to the overall understanding of human generated noise on marine wildlife. Once the data is analyzed, the results will be shared with the Hunter and Trapper Organization of Arctic Bay, the Hamlet, and the community at large.

The following suggested locations have been discussed with Arctic Bay Inuit Stewards of the Qikiqtani Inuit Association (QIA), Depart of Fisheries and Oceans scientists, and experts in underwater acoustics to help determine their suitability:

- 1) Adam's Sound, the approach to the community of Arctic Bay;
- 2) Strathcona Sound, the approach to the Nanisivik Naval Facility;
- 3) near Kakiak Point on Admiralty Inlet, an important area for the harvest of Narwhal by Arctic Bay Community members, and an important area of Narwhal habitat, although a Steward felt that there may be some reservations locally about the location, and felt further consultation necessary; and
- 4) the area in the vicinity of Sannirugaaluit (Yeoman Island), an area that should have less anthropogenic underwater noise.

The exact locations will be confirmed after further consultation with the community, including Arctic Bay Hunter and Trapper Organization, the Hamlet, and QIA. Discussion with QIA is also ongoing to explore potential partnership between Parks Canada and the Inuit Stewards regarding the deployment and recovery of the hydrophones.

2020 is an important year to start baseline data, as Covid-19 has reduced the amount of ship traffic that should be present in the Arctic. If there is any significant change in locations, or substantive changes in the project after consultation, the revision will be brought back to Nunavut Planning Committee.

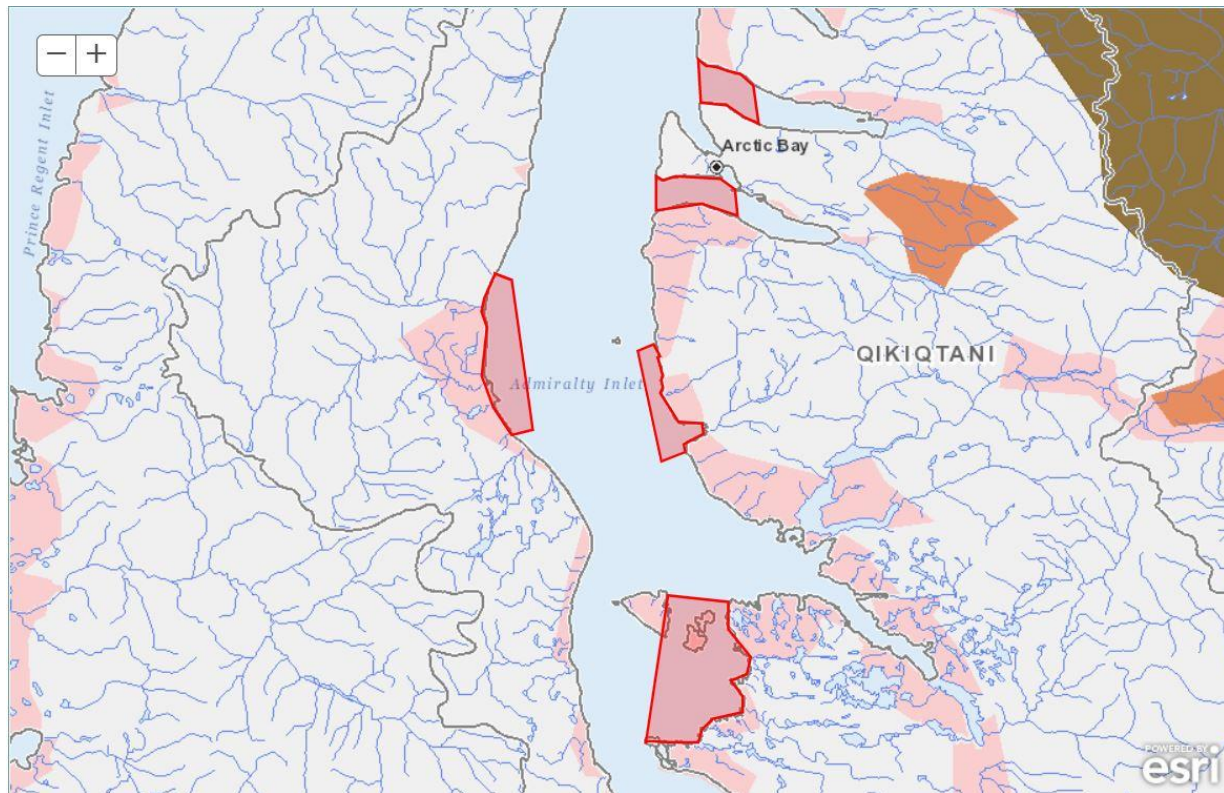
The four hydrophones that are to be deployed are Micro Aural hydrophones (Multi-Electronique Ltd.), locations 1-4 on the map. These hydrophones will be deployed annually over three years during the open water season. They would be deployed in waters less than 30 metres deep, using an anchor and surface buoy (see below photos of the hydrophones and quick release devices). At the earliest, initial deployment would take place in mid-August and the sites revisited in 5 week intervals (in late September and early November). An alternative mooring may be used, consisting of a subsurface buoy, and a Vemco Ascent acoustical release, depending on circumstance. In the case of the subsurface mooring, an anchor made of local rock with an eye bolt would be left behind. The acoustic devices also obtain data on tagged Greenland sharks as part of an ongoing study by Nigel Hussey of the University of Windsor. He has been using similar devices throughout Baffin Bay, including around Pond Inlet, Clyde River and Qikiqtarjuaq, to

monitor the movement of 180 Greenland sharks in order to support sustainable fisheries management and development of community fisheries. Nigel Hussey's research is conducted through the support of local HTOs, the Government of Nunavut and the Nunavut Fisheries Association with relevant licenses to fish obtained through the Department of Fisheries and Ocean. Basically, Nigel Hussey will lend Parks Canada some of his Vemco Ascent acoustical release to make the underwater noise baseline pilot project more efficient, while collecting data on Greenland sharks for him.

Hydrophones record sound, they do not make sound. They are passive and remain in one spot. Further, surface floats to which the hydrophones are attached are small vinyl floats that will not cause damage to boats and create no risk to wildlife. This technology, although relatively new, is in place throughout the Arctic and the rest of Canada and has been used by government and universities.

During the 2nd visit the data would be downloaded and the battery recharged. The equipment will be removed from the site during the 3rd visit in late October / early November. Dates may be adjusted to account for ice and other local conditions. The hydrophones are set to sample at 96,000 Hz and record at 15 minutes out of each hour, for approximately five weeks each deployment. It is important to note that the hydrophones record sounds only, and do not make any sound. No camp is planned, visits will be by boat. Vessels utilized to deploy and recover the hydrophones would be welded aluminum runabouts, not exceeding 28 feet, and powered by outboard motors. It is anticipated that either Arctic Bay Adventures' boat, or one used by the Inuit Stewards would be used, but circumstances may dictate similar boats being used. Social distancing and other Covid-19 protective measures will be followed as recommended by the Nunavut Health Authority and the Arctic Bay community council (e.g. use of personal protective equipment).

Data obtained would be recordings of underwater noise, including marine mammals, benthic organisms (animals that live on the bottom of the ocean), ship traffic, small vessel traffic, and ice. Data will be used to establish the baseline of underwater noise within TINMCA, in proximity of Arctic Bay. It is expected that the baseline data could help better understand the impact of underwater noise on, marine mammals within TINMCA, and could be used to complement the work on similar initiatives conducted in Nunavut waters and elsewhere. .



Polygons show approximate locations of hydrophone deployment, from the north the polygons represent the general area of deployment for Hydrophone 2, Hydrophone 1, Hydrophone 3, and alternate location for hydrophone 3, and Hydrophone 4.

# AURAL-M2

## Specification Sheet

### General

**Supply Voltage:** 12Vdc nominal (9Vdc to 15Vdc)

**Operating temperature:** 0 °C to 40 °C

**Tested depth:** 300 meters

**Case Material:** Stainless Steel 316, Delrin, Fiberglass Epoxy

**Anode Material:** Zinc

### Analog Section

**A/D:** 16 bits

**Filter:** Programmable frequency 8th order linear phase low pass (Anti Aliasing)

**Amplifier:** Low Noise amplification with 16, 18, 20 & 22 dB selectable gain

**Pressure Sensor:** 0 to 1000 psi (0–682 m.) (resolution: 1,3 cm, display: 0,1 m, accuracy: +/- 0,25 % max)

**Temperature sensor:** -10 °C to 40 °C (resolution: 0,0625 °C, display: 0,1 m, accuracy: +/- 0,5 °C)

**Hydrophone:** HTI-96-MIN

**Usable Frequency range:** 10 to 128, 256, 512, 1024, 2048, 4096, 8192, 16 384 Hz

### Digital Section

**MCU:** 33 MIPS Dallas DS89C450 Ultra High Speed Flash Microcontroller

**Flash Type & Size:** Compact Flash 1 GB or more

**Hard Disk Size:** 1 TB

**Hard Disk Data Transfer Speed:** 1.5 MB/Sec

**Time Base:** Low Power 32.768 KHz TCXO with +/- 2ppm accuracy

**Communication:** RS232 (38.4Kbs, N, 8, 1)

**System File Format:** FAT32

**Audio File Format:** WAV

**Sampling Rate:** 256, 512, 1024, 2048, 4096, 8192, 16 384, 32 768 samples/second

Power requirement	AURAL-M2 Release 2, 3 & 4
Standby	~ 8mA
Active - Wait to Record mode "5 sec"	~ 47 mA
Active - Record mode	~ 58mA
Active - Saving mode	~ 253mA



### Units Information

	16 batteries	64 batteries	128 batteries
<b>A</b> Diameter (1)	14,6 cm (5,75 in)	14,6 cm (5,75 in)	14,6 cm (5,75 in)
<b>B</b> Length	90 cm (35,375 in)	120 cm (47,375 in)	178 cm (70 in)
In air weight (2) (5)	20 Kg (45 lb)	32 Kg (71,5 lb)	49 Kg (109 lb)
In water weight (2) (4) (5)	9 Kg (19,5 lb)	14 Kg (30,5 lb)	21 Kg (46 lb)
Battery capacity (3)	30 Ah	120 Ah	240 Ah
Shipping case	-	16 Kg / 19 Kg 35,27 lb / 41,89 lb	21 Kg (46,30 lb)

(1) Cylinder only (without strap)

(2) Including EN95 Batteries

(3) Battery capacity using Energizer EN95 (Based on 15mA constant drain)

(4) Submerged in fresh water

(5) Valid informations for AURALS made since 01-01-09





# Ascent™ Acoustic Release



## Recover your marine instruments with VEMCO's shallow water acoustic release

### Key Features

- ▶ Depth rating: 500 metres
- ▶ AR battery life: 28 months  
AR-2 battery life: 60 months
- ▶ Real-time unit health information retrieval
- ▶ Quick and reliable release - typically within 30 seconds
- ▶ Easy re-arming method
- ▶ Release mechanism: push-off titanium pin has a copper sleeve to reduce biofouling and is controlled by a DC motor
- ▶ External case designed for easy attachment of marine instruments and flotation for buoyancy



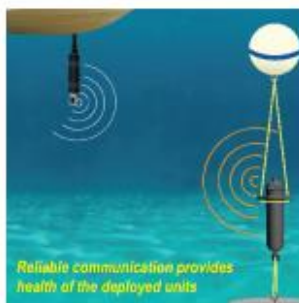
### The Ascent Acoustic Release

is ruggedly designed for superior performance, reliability and real-time communications. It is available in two battery life models:

- ▶ Ascent AR with a battery life of 28 months
- ▶ Ascent AR-2 with a battery life of 60 months

### Superior Communications

- ▶ 35 years experience in underwater communications
- ▶ Designed specifically for shallow water
  - reduced reflections
  - superior reliability
- ▶ Sophisticated transmission protocol
- ▶ Coded communication messages
  - pass more real-time information
  - eliminate false triggers



### Obtain Real-time Information from Deployed Units

- ▶ Unit health
- ▶ Tilt, depth and temperature
- ▶ Estimated remaining battery life
- ▶ Release status and activating the release
- ▶ Ability to get range and depth information as the unit is rising to the surface
- ▶ Estimate the distance between Ascent Acoustic Releases and the surface Deck Box
- ▶ Locate deployed units

### Unit Discovery Mode Option

- ▶ Determine which Ascents are within range of the Deck Box without having to remember specific serial numbers and exact release locations





Ascent AR and Ascent AR-2 Specifications	
AR Dimensions AR-2 Dimensions	Length: 401 mm, 342 mm without release lug Length: 465 mm, 406 mm without release lug Diameter: 81 mm Float attachment bracket width: 165 mm
AR Weight AR-2 Weight	2350 g in air; 500 g in water 2746 g in air; 812 g in water
AR Power supply AR-2 Power supply Common to AR and AR-2	1 - 3.6 V Lithium D cell battery 1 - 3.6 V Lithium DD cell battery 1 - 4 V Lithium AA cell battery (for release motor only)
AR Unit battery life AR-2 Unit battery life	Approximately 28 months Approximately 60 months
Release battery life	> 100 releases per battery
Maximum depth	500 metres
Communication	Acoustic via the VR100 Deck Box and Bluetooth®
Mooring	Mooring lug opening - 19 mm; Float attachment bracket - 2 x 14 mm
Firmware	Field upgradeable acoustic release firmware
Max test load	1000 lbs
Max safe working load	250 lbs
Max release load	250 lbs

