



SCREENING DECISION REPORT NIRB FILE No.: 06YN071

NPC File No.: 148573
NRI File No.: 0601016R-M
DFO File No.: S-17/18-1006-NU

July 26, 2017

Following the Nunavut Impact Review Board's (NIRB or Board) assessment of all materials provided, the NIRB is recommending that a review of ArcticNet's "ArcticNet Project 1: The Northwest Passage at the end of the Last Glaciation. ArcticNet 2: River sampling during 2017 ArcticNet expedition" is not required pursuant to paragraph 92(1)(a) of the *Nunavut Planning and Project Assessment Act* (NuPPAA).

Subject to the Proponent's compliance with the terms and conditions as set out in below, the NIRB is of the view that the project proposal is not likely to cause significant public concerns, and it is unlikely to result in significant adverse environmental and social impacts. The NIRB therefore recommends that the responsible Minister(s) accepts this Screening Decision Report.

OUTLINE OF SCREENING DECISION REPORT

- 1) REGULATORY FRAMEWORK
- 2) PROJECT REFERRAL
- 3) PROJECT OVERVIEW & THE NIRB ASSESSMENT PROCESS
- 4) ASSESSMENT OF THE PROJECT PROPOSAL IN ACCORDANCE WITH PART 3 OF NUPPAA
- 5) VIEWS OF THE BOARD
- 6) RECOMMENDED PROJECT-SPECIFIC TERMS AND CONDITIONS
- 7) OTHER NIRB CONCERNS AND RECOMMENDATIONS
- 8) REGULATORY REQUIREMENTS
- 9) CONCLUSION

REGULATORY FRAMEWORK

The primary objectives of the NIRB are set out in Section 12.2.5 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement) as follows:

"In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut

Settlement Area. NIRB shall take into account the well-being of the residents of Canada outside the Nunavut Settlement Area.”

These objectives are confirmed under section 23 of the NuPPAA.

The purpose of screening is provided for under section 88 of the NuPPAA:

“The purpose of screening a project is to determine whether the project has the potential to result in significant ecosystemic or socio-economic impacts and, accordingly, whether it requires a review by the Board...”

To determine whether a review of a project is required, the NIRB is guided by the considerations as set out under subsection 89(1) of NuPPAA:

“89. (1) The Board must be guided by the following considerations when it is called on to determine, on the completion of a screening, whether a review of the project is required:

- (a) a review is required if, in the Board’s opinion,*
 - i. the project may have significant adverse ecosystemic or socio-economic impacts or significant adverse impacts on wildlife habitat or Inuit harvest activities,*
 - ii. the project will cause significant public concern, or*
 - iii. the project involves technological innovations, the effects of which are unknown; and*
- (b) a review is not required if, in the Board’s opinion,*
 - i. the project is unlikely to cause significant public concern, and*
 - ii. its adverse ecosystemic and socioeconomic impacts are unlikely to be significant, or are highly predictable and can be adequately mitigated by known technologies.”*

It is noted that subsection 89(2) provides that the considerations set out in paragraph 89(1)(a) prevail over those set out in paragraph 89(1)(b).

Where the NIRB determines that a project may be carried out without a review, the NIRB has the discretion to recommend specific terms and conditions to be attached to any approval of the project proposal. Specifically, paragraph 92(2)(a) of NuPPAA provides:

“92. (2) In its report, the Board may also
(a) recommend specific terms and conditions to apply in respect of a project that it determines may be carried out without a review.”

PROJECT REFERRAL

On May 23, 2017 the Nunavut Impact Review Board (NIRB or Board) received a referral to screen ArcticNet’s “ArcticNet Project 1: The Northwest Passage at the end of the Last Glaciation. ArcticNet 2: River sampling during 2017 ArcticNet expedition” project proposal from the Nunavut Planning Commission (NPC or Commission), with an accompanying positive

conformity determination with the North Baffin Regional Land Use Plan. The NPC noted that the previous conformity determination issued on July 11, 2006 for the activities associated with the current proposal continues to apply and determined that the project proposal was a significant modification to the project because of the addition of the collection of river water samples was not part of the original or previously amended proposal and its inclusion is a significant modification of the project.

Pursuant to Article 12, Sections 12.4.1 and 12.4.4 of the Nunavut Agreement and section 87 of the NuPPAA, the NIRB commenced screening this project proposal. Due to the proposal containing activities that were sufficiently related to previously assessed activities under NIRB file number **06YN071**, the NIRB viewed this project proposal as an amendment to the previously screened project and assigned this proposal with this previous file number. A summary of the previously screened project activities can be found in **Appendix A**.

PROJECT OVERVIEW & THE NIRB ASSESSMENT PROCESS

1. Project Scope

The proposed “ArcticNet Project 1: The Northwest Passage at the end of the Last Glaciation. ArcticNet 2: River sampling during 2017 ArcticNet expedition” (formerly ArcticNet Marine-based research program: Integrated Regional Impact Study of the Canadian High Arctic) project a shore based study located within the Kitikmeot and Qikiqtani regions. The Proponent intends to conduct a study of the Canadian Arctic Archipelago environment and its sensitivity to environmental variability and change along shorelines as previously approved and is currently proposing the addition of river sampling to the project. The additional program is proposed to take place from July to August. The scope of activities previously approved for this ongoing research (NIRB File No. 06YN071) has been included within **Appendix A**.

As required under subsection 86(1) of the NuPPAA, the Board accepts the scope of the “ArcticNet Project 1: The Northwest Passage at the end of the Last Glaciation. ArcticNet 2: River sampling during 2017 ArcticNet expedition” as set out by ArcticNet in the proposal. The scope of the project proposal includes the following undertakings, works, or activities:

- Use of the helicopter on board the CCGS Amundsen to sample various river locations along the route, weather dependent,
 - Collect eight (8) litres (L) via battery-powered pump for further analysis and some samples would be preserved with mercuric chloride,
 - Use of sensors to measure temperature, salinity, and water flow rate, and
- Any garbage or materials taken to the sampling location would be taken back to the ship to be disposed of appropriately.

2. Inclusion or Exclusion to Scoping List

The NIRB has identified no additional works or activities in relation to the project proposal. As a result, the NIRB proceeded with screening the project based on the scope as described above. However, the NIRB notes that the research activities proposed to occur within the Sirmilik National Park and the Queen Maud Gulf Migratory Bird Sanctuary were not able to be permitted for this operational season due to the project proposal being submitted after the deadlines. Therefore, the river sampling locations that are within the Sirmilik National Park and the Queen

Maud Gulf Migratory Bird Sanctuary would not be sampled in 2017 as noted by Parks Canada, and Environment and Climate Change Canada.

3. Key Stages of the Screening Process

The following key stages were completed:

Date	Stage
May 23, 2017	Receipt of project proposal and positive conformity determination (North Baffin Regional Land Use Plan) from the NPC
May 24, 2017	Information request(s)
June 1, 2017	Proponent responded to information request(s)
June 1, 2017	Scoping pursuant to subsection 86(1) of the NuPPAA
June 16, 2017	Public engagement and comment request
June 26, 2017	Receipt of public comments
July 17, 2017	Ministerial extension requested from the Government of Nunavut's Minister Responsible for Nunavut Arctic College, and Government of Canada Ministers of Environment and Climate Change and Fisheries and Oceans and Canadian Coast Guard

4. Public Comments and Concerns

Notice regarding the NIRB's screening of this project proposal was distributed on June 16, 2017 to community organizations in Clyde River, Grise Fiord, Resolute Bay, Pond Inlet, Iqaluit, Qikiqtarjuaq, seasonal communities of Bathurst Inlet and Bay Chimo, Kugluktuk, Cambridge Bay, Gjoa Haven and Taloyoak as well as to relevant federal and territorial government agencies, Inuit organizations and other parties. The NIRB requested that interested parties review the proposal and provide the Board with any comments or concerns by June 26, 2017 regarding:

- Whether the project proposal is likely to arouse significant public concern; and if so, why;
- Whether the project proposal is likely to cause significant adverse eco-systemic or socio-economic effects; and if so, why;
- Whether the project proposal is likely to cause significant adverse impacts on wildlife habitat or Inuit harvest activities; if so, why;
- Whether the project proposal is of a type where the potential adverse effects are highly predictable and mitigable with known technology, (please provide any recommended mitigation measures); and
- Any matter of importance to the Party related to the project proposal.

The following is a summary of the comments and concerns received by the NIRB:

Environment and Climate Change Canada (ECCC)

- Canadian Wildlife Service (CWS) permit is required for the Proponent to enter and collect water samples at three river sampling sites in the Queen Maud Gulf Migratory Bird Sanctuary. The deadline to apply for a permit to access Migratory Bird Sanctuaries in Nunavut between June and October of this year was February 1, 2017. Without a

CWS permit the Proponent will be unable to access or complete the proposed work at the three river sites located in the Queen Maud Gulf Migratory Bird Sanctuary.

Fisheries and Oceans Canada (DFO)

- Noted the proposal does not require a *Fisheries Act* Authorization.
- Recommended the Proponent follow DFO's guidance tools which can be found at the following website: (<http://www.dfo-mpo.gc.ca/pnw-ppe/mesures/measure-mesures-eng.html>).

Indigenous and Northern Affairs Canada (INAC)

- No comments of additional terms and conditions to offer at this time.

5. Comments and Concerns with respect to Inuit Qaujimaningit, Traditional, and Community Knowledge

No concerns or comments were received with respect to Inuit Qaujimaningit or traditional and community knowledge in relation to the proposed project.

6. Time of Report Extension

The NIRB was not able to provide its screening decision report to the responsible Minister within 45 days as required by Article 12, Section 12.4.5 of the Nunavut Agreement and subsection 92(3) of the NuPPAA due to the high volume of screenings being considered by the Board since that date and the continued vacancies on the Board limiting board member availability. Therefore, on July 17, 2017 the NIRB wrote to the Government of Nunavut's Minister Responsible for Nunavut Arctic College, and Government of Canada Ministers of Environment and Climate Change, and Fisheries and Oceans and Canadian Coast Guard, seeking an extension to the 45-day timeline for the provision of the Board's Report.

ASSESSMENT OF THE PROJECT PROPOSAL IN ACCORDANCE WITH PART 3 OF NuPPAA

In determining whether a review of the project is required, the Board considered whether the project proposal had potential to result in significant ecosystemic or socio-economic impacts.

Accordingly, the assessment of impact significance was based on the analysis of those factors that are set out under section 90 of the NuPPAA. The Board took particular care to take into account Inuit Qaujimaningit, traditional and community knowledge in carrying out its assessment and determination of the significance of impacts.

The following is a summary of the Board's assessment of the factors that are relevant to the determination of significant impacts with respect of this project proposal:

1. *The size of the geographic area, including the size of wildlife habitats, likely to be affected by the impacts.*

The size of the geographic area of the proposed project includes several river and shoreline study sites within the Kitikmeot and North Baffin regions near the communities of Arctic Bay, Cambridge Bay, Gjoa Haven, Pond Inlet, and Resolute Bay, within the Sirmilik

National Park on Bylot Island and within Queen Maud Gulf Migratory Bird Sanctuary. The project footprint would also include aircraft-assisted travel routes to and from the sampling sites from the CCGS Amundsen. As identified by the Proponent, GN, and NPC mapping sources, the proposed activities may take place within habitat and seasonal ranges for far-ranging and local terrestrial and marine wildlife, migratory and non-migratory birds and Species at Risk such as Ivory Gull, Eskimo Curlew, and Polar Bear.

2. *The ecosystemic sensitivity of that area.*

The proposed project would occur in an area with no particular identified ecosystemic sensitivity with the exception of some sampling sites would fall within the Sirmilik National Park and the Queen Maud Gulf Migratory Bird Sanctuary. These areas have been identified as having value and priority to the local communities for:

- i. Terrestrial wildlife such as caribou and crossings,
- ii. Marine Mammals including walrus habitat, bearded and ring seal breeding ground, narwhal, beluga,
- iii. Polar Bears, including hunting, and
- iv. Substance hunting and sport hunting.

3. *The historical, cultural, and archaeological significance of that area.*

Neither the Proponent nor any parties that submitted comments for this proposed project identified any known areas of historical and archaeological significance associated with the project areas. Should the project be approved to proceed, the Proponent would be required to contact the Government of Nunavut – Department of Culture and Heritage if any sites of historical, cultural, or archaeological significance are encountered.

4. *The size of the human and the animal populations likely to be affected by the impacts.*

The proposed project includes several river and shoreline study sites within the Kitikmeot and North Baffin regions near the communities of Arctic Bay, Cambridge Bay, Gjoa Haven, Pond Inlet, and Resolute Bay; as such human populations are likely to be affected by project impacts, but only temporarily. The proposed project could interact with various marine and terrestrial species, including Species at Risk, throughout the project area.

No significant public concerns were raised during the public commenting period; however, the NIRB notes the close proximity of the proposed project to several communities and important conservation areas, and as a result has recommended a condition to direct engagement with the communities, hunters and trappers organization and interested parties, as well as posting of public notices to ensure residents are aware of the research activities being or to be conducted.

5. *The nature, magnitude, and complexity of the impacts; the probability of the impacts occurring; the frequency and duration of the impacts; and the reversibility or irreversibility of the impacts.*

As this research project would involve the collection of river water samples for chemical analysis, including measurement of greenhouse gases within the Kitikmeot and North Baffin

regions, the nature of potential adverse impacts is considered to be well-known, of low magnitude, infrequent, reversible and mitigable with due care.

6. *The cumulative impacts that could result from the impacts of the project combined with those of any other project that has been carried out, is being carried out or is likely to be carried out.*

The proposed project would take place in proximity to a number of other active projects that have been or are currently being assessed by the Board.

Due to the number of research projects occurring in proximity to the Northwest Passage, the potential for cumulative impacts has been identified to terrestrial wildlife and habitat, fish and fish habitat, migratory birds, marine mammals, water quality, cultural and archaeological resources, air quality, traditional wildlife harvesting pursuits, and local economies. As a result, the NIRB has provided recommendations for mitigation to reduce the potential of any residual effects resulting from this project which continue to apply.

7. *Any other factor that the Board considers relevant to the assessment of the significance of impacts.*

No other specific factors have been identified as relevant to the assessment of this project proposal.

Views of the Board

In considering the factors as set out above in the screening of the project proposal, the NIRB has identified a number of issues below and respectfully provide the following views regarding whether or not the proposed project has the potential to result in significant impacts. In addition, the NIRB has proposed terms and conditions that would mitigate the potential adverse impacts identified.

Administrative Conditions:

To encourage compliance with applicable regulatory requirements and assist the Board and responsible authorities with compliance and effects monitoring for project activities, the Board has previously recommended terms and conditions 1 and 2 which continue to apply to the current project proposal. The Board is also recommending term and condition 15 through 17 to ensure complete reference to applicable regulatory requirements.

The Board would also note that, as justified in its previous decision (NIRB File No.: 06YN071 dated August 22, 2006), terms and conditions 3 through 7 remain applicable to the project ship based study research activities, while the additional impacts identified for the new components of the research warrant mitigation measures as justified below.

Ecosystem, wildlife habitat and Inuit harvesting activities:

Issue 1: Potential adverse impacts to terrestrial and marine wildlife from the research activities, the use of a helicopter to transport personnel to and from research sites and increased noise due to the research activities to proposed project sites.

Board views: As discussed above, the potential for impacts is applicable to small study sites and is limited due to infrequent activities but may affect several terrestrial wildlife species, marine wildlife species and migratory and non-migratory birds. Further, the some of the proposed research sites would fall within the Sirmilik National Park and Queen Maud Gulf Migratory Bird Sanctuary. However, any resulting impacts would be expected to be temporary only, low in magnitude and reversible in nature. Minimum flight altitudes and seasonal restrictions are expected to further mitigate potential adverse impacts to terrestrial wildlife, migratory and non-migratory birds.

The Proponent would also be required to follow the *Migratory Birds Convention Act*, *Migratory Birds Regulations*, *Species at Risk Act*, the *Wildlife Act (Nunavut)*, and the *Canada National Parks Act* (see Regulatory Requirements section).

Recommended Mitigation Measures: The potential adverse impacts may be mitigated by measures such as requiring the Proponent to maintain minimum flight altitudes and seasonal restrictions. The Board has previously recommended terms and conditions to mitigate potential adverse impacts to wildlife, specifically 9 through 13 which continue to apply to the current project proposal. In addition, the NIRB also recommends the following terms and conditions to mitigate potential adverse impacts to wildlife and their habitat: 18 through 29.

Issue 2: Potential adverse impacts to surface water quality, fish and fish habitat, soil and vegetation from research sampling (use of chemicals for preservation) and from the transportation of personnel via helicopter including refuelling activities.

Board views: As discussed in the previous section, the potential for impacts is applicable to a limited geographic area and the probability of impacts occurring is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence, and reversible in nature due to the short period of the research activities.

Further, it is noted that the project activities would occur in proximity to the within the Sirmilik National Park and Queen Maud Gulf Migratory Bird Sanctuary and that there is the potential for adverse impacts to the watercourses flowing through the park and bird sanctuary from improper management of wastes. The potential for impacts is considered to be low, with potential adverse effects anticipated to be low in magnitude, infrequent in occurrence, and reversible in nature.

Recommended Mitigation Measures: The Board previously recommended terms and conditions: to reduce potential adverse impacts from fuel/chemical spill hazards by issuing terms and conditions 8 and 10, which continue to apply to the current proposed project. In addition, the following terms and conditions are recommended to mitigate the potential

adverse impacts from conducting the research activities along the shoreline and at the rivers: 30 and 31.

Issue 3: Potential adverse impacts to public and traditional land use activities in the different areas due to the research activities.

Board Views: Due to the project's proximity to several communities in the Kitikmeot and North Baffin region, there is the potential for adverse impacts to arise as a result of the research activities and the use of the helicopter for transportation overlapping with traditional land and ice-floe edge use, and harvesting activities from community members. If situations arise where the project may interfere with traditional land use, mitigation measures have been recommended to ensure safety to the public and to minimal impacts to traditional land use activities.

Recommended Mitigation Measures: Term and condition 32 is recommended to ensure that the affected communities and organizations are informed about the project proposal and term and condition 33 has been recommended to ensure that project activities do not interfere with Inuit wildlife harvesting or traditional land use activities in the area. In addition, terms and conditions 9 through 12, and 20 through 29 have been recommended to minimize interference with the movements of terrestrial wildlife and nesting/breeding birds.

Socio-economic effects on northerners:

Issue 4: Potential adverse impacts to historical, cultural and archaeological sites from research activities.

Board Views: The Proponent is proposing to work in areas of no known historical significance. The Proponent would be required to contact the Government of Nunavut-Department of Culture and Heritage when encountering historical sites and would be required to follow the *Nunavut Act* (as recommended in Regulatory Requirements section).

Recommended Mitigation Measures: The Board previously recommended term and condition 14 to ensure the Proponent was aware that it is illegal to alter or disturb any palaeontological site in Nunavut unless permission is first granted through the permitting process, which continues to apply to this proposed project. Term and condition 32 is recommended to ensure that available Inuit Qaujimaningit can inform project activities, and reduce the potential for negative impacts occurring to any historical sites.

Significant public concern:

Issue 5: No significant public concern was expressed during the public commenting period for this file.

Board Views: Follow up consultation and involvement of local community members is expected to mitigate any potential for public concern resulting from project activities. It is recommended that the Proponent considers hiring local people for the project activities.

Recommended Mitigation Measures: Term and condition 32 is recommended to ensure that the affected community and organizations are informed about the project proposal, and to provide the Proponent with an opportunity to proactively address or mitigate any concerns that may arise from the project activities findings. Term and condition 34 is recommended to ensure that the Proponent provide community members with information to ensure a successful local hiring opportunity.

Technological innovations for which the effects are unknown:

No specific issues have been identified associated with this project proposal.

In considering the above factors and subject to the Proponent's compliance with the terms and conditions necessary to mitigate against the potential adverse environmental and social effects, the Board is of the view that the proposed project is unlikely to cause significant public concern and its adverse ecosystemic and socioeconomic impacts are unlikely to be significant, or are highly predictable and can be adequately mitigated by known technologies.

RECOMMENDED PROJECT-SPECIFIC TERMS AND CONDITIONS

The following terms and conditions were previously issued by the NIRB in the August 22, 2006 Screening Decision Report(s) for File No. 06YN071, **and continue to apply to the ArcticNet Project 1: The Northwest Passage at the end of the Last Glaciation. ArcticNet Project 2: River sampling during the 2017 ArcticNet expedition" project:**

General

1. Dr. Martin Fortier (The Proponent) shall maintain a copy of the Project Terms and Conditions at the sites of operation at all times.
2. Prior to commencing research activities, the Proponent shall submit to NIRB copies of all permits, licenses and authorizations required to undertake the project.

Radioisotopes

3. The Proponent shall use all radioisotopes in accordance with the security policies of Laval University and Fisheries and Oceans Canada.
4. The Proponent shall not discard any radioactive isotopes at sea. All waste material shall be stored onboard in storage drums.

Wildlife

5. The Proponent shall attenuate sound frequencies using sounders.
6. If areas of concentration of marine mammals or hunting activity are encountered, the Proponent shall avoid such areas and any other specific location identified by local communities.
7. If marine mammals are encountered, the Proponent will cease operation and move to an alternate location.

8. The Proponent shall not deposit, nor permit the deposit of any fuel, chemicals, wastes, or sediment into any water body. Be advised that the deposition of deleterious substances in or near water bodies is a violation of Section 36(3) of the *Fisheries Act*, which states:
“The deposition of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water, is prohibited.”
9. The Proponent shall follow Section 6 (a) of the *Migratory Birds Regulations* that states:
“No one shall disturb or destroy the nests or eggs of migratory birds. If active nests are encountered during project activities, the nesting area should be avoided to prevent disturbance (i.e. the young have left the vicinity of the nest).”
10. The Proponent shall follow Section 35 of the *Migratory Birds Regulations* that states:
“No person shall deposit or permit to be deposited, oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds.”
11. The Proponent shall ensure that aircraft used in conducting project activities maintain a flight altitude of at least 610 m during horizontal (point to point) flight to avoid disturbing nesting birds, and a vertical distance of 1000 m and minimum horizontal distance of 1500 m from any observed concentrations (flocks/groups) of birds in order to reduce disturbance to resting, feeding, or moulting birds.
12. The Proponent shall ensure that aircraft do not, unless for emergency, touch-down in areas where wildlife are present.
13. The Proponent shall follow Section 79 (2) of the *Species at Risk Act* (SARA) that states that during an assessment of effects of a project, the adverse effects of the project on listed wildlife species and its critical habitat must be identified, that measures are taken to avoid or lessen those effects, and that the effects need to be monitored. This section applies to all species listed on Schedule 1 of SARA. However, as a matter of best practice, the Proponent is asked to consider other Schedules of SARA and under consideration for listing be included in this type of assessment.

Archaeological

14. The Proponent should be aware that under the *Nunavut Archaeological and Palaeontological Sites Regulations*, it is illegal to alter or disturb any palaeontological site in Nunavut unless permission is first granted through the permitting process. If a site is found it should remain undisturbed and its location should be reported to the Government of Nunavut – Culture, Language, Elders and Youth.

In addition to the previously issued terms and conditions, the Board recommends the following project-specific terms and conditions:

General

15. ArcticNet (the Proponent) shall maintain a copy of the Project Terms and Conditions at the site of operation at all times.

16. The Proponent shall operate in accordance with all commitments stated in correspondence provided to the Nunavut Planning Commission (Application to Determine Conformity, May 23, 2017), and the NIRB (Online Application Form, June 1, 2017; Project Summary, June 1, 2017).
17. The Proponent shall operate the site in accordance with all applicable Acts, Regulations and Guidelines.

Waste Disposal

18. The Proponent shall keep all garbage and debris in bags placed in a covered metal container or equivalent until disposed of at an approved facility. All such wastes shall be kept inaccessible to wildlife at all times.

Wildlife - General

19. The Proponent shall ensure that there is no damage to wildlife habitat in conducting this operation.
20. The Proponent shall not harass wildlife. This includes persistently circling, chasing, hovering over pursuing or in any other way harass wildlife, or disturbing large groups of animals.
21. The Proponent shall not hunt or fish, unless proper Nunavut authorizations have been acquired.
22. The Proponent shall ensure that all project personnel are made aware of the measures to protect wildlife and are provided with training and/or advice on how to implement these measures.

Migratory Birds and Raptors Disturbance

23. The Proponent shall minimize activities during periods when birds are particularly sensitive to disturbance such as migration, nesting and moulting.
24. The Proponent shall avoid the seaward site of seabird colonies and areas used by flocks of migrating waterfowl by three (3) kilometres.
25. The Proponent shall ensure its aircraft avoid excessive hovering or circling over areas where bird presence is likely.

Aircraft Flight Restrictions

26. The Proponent shall not alter flight paths to approach wildlife, and avoid flying directly over animals.
27. The Proponent shall advise all pilots of relevant flight restrictions and enforce their application over the project area, including flight paths to/from the project area.

Caribou and Muskoxen Disturbance

28. The Proponent shall cease activities that may interfere with the migration or calving of caribou or muskox, until the caribou or muskox have passed or left the area.
29. The Proponent shall not block or cause any diversion to caribou migration, and shall cease activities likely to interfere with migration such as movement of equipment or personnel until such time as the caribou have passed.

Restoration of Disturbed Areas

30. The Proponent shall remove all garbage, fuel and equipment upon abandonment.
31. The Proponent shall ensure that all disturbed areas are restored to a stable or pre-disturbed state as practical as possible upon completion of field work.

Other

32. The Proponent should consult with local residents regarding their activities in the area and solicit available Inuit Qaujimaningit and information that can inform project activities.
33. The Proponent shall ensure that project activities do not interfere with Inuit wildlife harvesting or traditional land use activities.
34. The Proponent should, to the extent possible, hire local people and access local services where possible.

OTHER NIRB CONCERNS AND RECOMMENDATIONS

In addition to the project-specific terms and conditions, the Board is recommending the following:

Change in Project Scope

1. Responsible authorities or Proponent shall notify the Nunavut Planning Commission (NPC) and the NIRB of any changes in operating plans or conditions, including phase advancement, associated with this project prior to any such change.

Bear and Carnivore Safety

2. The Proponent should review the Government of Nunavut's booklet on Bear Safety, which can be downloaded from this link: http://gov.nu.ca/sites/default/files/bear_safety_-_reducing_bear-people_conflicts_in_nunavut.pdf. Further information on bear/carnivore detection and deterrent techniques can be found in the "*Safety in Grizzly and Black Bear Country*" pamphlet, which can be downloaded from this link: http://www.enr.gov.nt.ca/sites/default/files/web_pdf_wd_bear_safety_brochure_1_may_2015.pdf.
3. There are polar bear and grizzly bear safety resources available from the Bear Smart Society with videos on polar bear safety available in English, French and Inuktitut at <http://www.bearsmart.com/play/safety-in-polar-bear-country/>. Information can also be obtained from Parks Canada's website on bear safety at the following link: <http://www.pc.gc.ca/eng/pn-np/nu/quttinirpaaq/visit/visit6/d.aspx> or in reviewing the "*Safety in Polar Bear Country*" pamphlet, which can be downloaded from the following link: http://www.pc.gc.ca/eng/pn-np/nu/quttinirpaaq/visit/visit6/~/_media/pn-np/nu/auyuittuq/pdf/shared/PolarBearSafety_English.ashx.
4. Any problem wildlife or any interaction with carnivores should be reported immediately to the local Government of Nunavut, Department of Environment Conservation Office (Conservation Officer of Iqaluit, phone: (867) 462-4002).

Species at Risk

5. The Proponent review Environment and Climate Change Canada's "Environment Assessment Best Practice Guide for Wildlife at Risk in Canada", available at the following link:
http://www.sararegistry.gc.ca/virtual_sara/files/policies/EA%20Best%20Practices%202004.pdf. The guide provides information to the Proponent on what is required when Wildlife at Risk, including *Species at Risk*, are encountered or affected by the project.

Migratory Birds

6. The Proponent review Canadian Wildlife Services' "Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut", available at the following link: <http://publications.gc.ca/site/eng/317630/publication.html> and "Key marine habitat sites for migratory birds in Nunavut and the Northwest Territories", available at the following link: <http://publications.gc.ca/site/eng/392824/publication.html>. The guide provides information to the Proponent on key terrestrial and marine habitat areas that are essential to the welfare of various migratory bird species in Canada.
7. For further information on how to protect migratory birds, their nests and eggs when planning or carrying out project activities, consult Environment and Climate Change Canada's Incidental Take web page and the fact sheet "Planning Ahead to Reduce the Risk of Detrimental Effects to Migratory Birds, and their Nests and Eggs" available at <http://www.ec.gc.ca/paom-itmb/>.

REGULATORY REQUIREMENTS

The Proponent is also advised that the following legislation may apply to the project:

Acts and Regulations

1. The *Fisheries Act* (<http://laws-lois.justice.gc.ca/eng/acts/F-14/index.html>).
2. The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (<http://laws-lois.justice.gc.ca/eng/acts/n-28.8/>).
3. The *Migratory Birds Convention Act* and *Migratory Birds Regulations* (<http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>).
4. The *Species at Risk Act* (<http://laws-lois.justice.gc.ca/eng/acts/S-15.3/index.html>). Attached in **Appendix B** is a list of Species at Risk in Nunavut.
5. The *Wildlife Act (Nunavut)* and its corresponding regulations (<http://www.canlii.org/en/nu/laws/stat/snu-2003-c-26/latest/snu-2003-c-26.html>) contains provisions to protect and conserve wildlife and wildlife habitat, including specific protection measures for wildlife habitat and species at risk.
6. The *Nunavut Act* (<http://laws-lois.justice.gc.ca/eng/acts/N-28.6/>). The Proponent must comply with the proposed terms and conditions listed in the attached **Appendix C**.
7. The *Canada National Parks Act* (<http://laws-lois.justice.gc.ca/eng/acts/n-14.01/>).
8. The *Aeronautics Act* (<http://laws-lois.justice.gc.ca/eng/acts/A-2/>).

CONCLUSION

The foregoing constitutes the Board's screening decision with respect to the ArcticNet's "ArcticNet Project 1: The Northwest Passage at the end of the Last Glaciation. ArcticNet 2: River sampling during 2017 ArcticNet expedition". The NIRB remains available for consultation with the Minister regarding this report as necessary.

Dated July 26, 2017 at Whale Cove, NU.



Elizabeth Copland, Chairperson

Attachments: Appendix A: Previously-Screened Project Proposals
 Appendix B: Species at Risk in Nunavut
 Appendix C: Archaeological and Palaeontological Resources Terms and Conditions for Land Use
 Permit Holders

APPENDIX A: PREVIOUSLY-SCREENED PROJECT PROPOSALS

The original project proposal NIRB (File No. 06YN071), was received by the NIRB from the Nunavut Research Institute (NRI) on July 5, 2006 and was screened by the Board in accordance with Part 4, Article 12 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement). On August 22, 2006 the NIRB issued a Nunavut Agreement 12.4.4(a) screening decision to the Minister of Culture, Language, Elders and Youth (Government of Nunavut) which indicated that the proposed project could proceed subject to the NIRB's recommended project-specific terms and conditions.

The University of Laval's (Proponent) original "ArcticNet marine-based research program: Integrated Regional Impact Study of the Canadian High Arctic" project was a ship based study located within the Kitikmeot, Kivalliq, and Qikiqtani regions. The Proponent indicated that it intended to study the Canadian Arctic Archipelago environment and its sensitivity to environmental variability and change, with proposed project activities to take place between mid-August and November 2006.

According to the previously screened project proposal, the scope of the project included the following undertakings, works or activities:

- Use of *CCGS Amundsen* ship as the base location;
 - Storage of fuel and chemicals
 - Housing for up to 43 scientists and 39 Canadian Coast Guard crew
 - Use of a zodiac boat
 - Use of a helicopter for scheduled crew changes in Pond Inlet, Resolute, and Kugluktuk
- Examine sea ice cover, ocean currents and contaminants;
- Mooring to measure the sinking of carbon to the ocean bottom;
- Use of sediment traps to obtain sediment core samples; and
- Collection of water, plankton, juvenile fish and sea ice samples.

Additional authorization and extension requests associated with the "ArcticNet marine-based research program: Integrated Regional Impact Study of the Canadian High Arctic" project have also been reviewed by the NIRB following screening of the original project proposal (File No. 06YN071). In each instance where the NIRB received applications up to and including April 24, 2013, the NIRB confirmed that the applications were exempt from the requirement for further screening pursuant to Section 12.4.3 of the Nunavut Agreement and that the activities therein remained subject to the terms and conditions recommended in the original August 22, 2006 Screening Decision Report. The following is a summary of the previously screened project activities as received by the NIRB:

The scope of the previously screened project associated with the previous May 10, 2007 amendment application included the following undertakings, works or activities:

- The inclusion of sampling locations in Hudson Bay.

The scope of the previously screened project associated with the previous August 31, 2009 amendment included the following undertakings, works or activities:

- The inclusion of sampling locations in McClure Strait.

The scope of the previously screened project associated with the previous April 24, 2013 was to extend Université Laval's Scientific Research Licence to continue with previously approved research activities between August and October 2013.

Appendix B

Species at Risk in Nunavut

Due to the requirements of Section 79(2) of the Species At Risk Act (SARA), and the potential for project-specific adverse effects on listed wildlife species and its critical habitat, measures should be taken as appropriate to avoid or lessen those effects, and the effects need to be monitored. Project effects could include species disturbance, attraction to operations and destruction of habitat. This section applies to all species listed on Schedule 1 of SARA, as listed in the table below, or have been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which may be encountered in the project area. This list may not include all species identified as at risk by the Territorial Government. The following points provide clarification on the applicability of the species outlined in the table.

- Schedule 1 is the official legal list of Species at Risk for SARA. SARA applies to all species on Schedule 1. The term “listed” species refers to species on Schedule 1.
- Schedule 2 and 3 of SARA identify species that were designated at risk by the COSEWIC prior to October 1999 and must be reassessed using revised criteria before they can be considered for addition to Schedule 1.
- Some species identified at risk by COSEWIC are “pending” addition to Schedule 1 of SARA. These species are under consideration for addition to Schedule 1, subject to further consultation or assessment.

If species at risk are encountered or affected, the primary mitigation measure should be avoidance. The Proponent should avoid contact with or disturbance to each species, its habitat and/or its residence. All direct, indirect, and cumulative effects should be considered. Refer to species status reports and other information on the species at risk Registry at <http://www.sararegistry.gc.ca> for information on specific species.

Monitoring should be undertaken by the Proponent to determine the effectiveness of mitigation and/or identify where further mitigation is required. As a minimum, this monitoring should include recording the locations and dates of any observations of species at risk, behaviour or actions taken by the animals when project activities were encountered, and any actions taken by the proponent to avoid contact or disturbance to the species, its habitat, and/or its residence. This information should be submitted to the appropriate regulators and organizations with management responsibility for that species, as requested.

For species primarily managed by the Territorial Government, the Territorial Government should be consulted to identify other appropriate mitigation and/or monitoring measures to minimize effects to these species from the project.

Mitigation and monitoring measures must be undertaken in a way that is consistent with applicable recovery strategies and action/management plans.

Schedules of SARA are amended on a regular basis so it is important to check the SARA registry (www.sararegistry.gc.ca) to get the current status of a species.

Updated: October 2016

Species at Risk ¹	COSEWIC Designation	Schedule of SARA	Government Organization with Primary Management Responsibility ²
Migratory Birds			
Eskimo Curlew	Endangered	Schedule 1	ECCC
Buff-breasted Sandpiper	Special concern	Pending	ECCC
Ivory Gull	Endangered	Schedule 1	ECCC
Ross's Gull	Threatened	Schedule 1	ECCC
Harlequin Duck (Eastern population)	Special Concern	Schedule 1	ECCC
Rusty Blackbird	Special Concern	Schedule 1	GN
Peregrine Falcon	Special Concern (<i>anatum-tundrius</i> complex ³)	Schedule 1 - Threatened (<i>anatum</i>) Schedule 3 – Special Concern (<i>tundrius</i>)	GN
Short-eared Owl	Special Concern	Schedule 1	GN
Red Knot (<i>rufa</i> subspecies)	Endangered	Schedule 1	ECCC
Red Knot (<i>islandica</i> subspecies)	Special Concern	Schedule 1	ECCC
Horned Grebe (Western population)	Special Concern	Pending	ECCC
Red-necked Phalarope	Special concern	Pending	ECCC
Vegetation			
Felt-leaf Willow	Special Concern	Schedule 1	GN
Blanket-leaved Willow	Special Concern	Schedule 1	GN
Porsild's Bryum (Moss)	Threatened	Schedule 1	GN
Terrestrial Wildlife			
Peary Caribou	Endangered	Schedule 1	GN
Peary Caribou (High Arctic Population)	Endangered	Schedule 2	GN
Peary Caribou (Low Arctic Population)	Threatened	Schedule 2	GN
Dolphin and Union Caribou	Special Concern	Schedule 1	GN
Grizzly Bear (Western Population)	Special Concern	Pending	GN
Wolverine	Special Concern	Pending	GN
Marine Wildlife			
Polar Bear	Special Concern	Schedule 1	GN/DFO
Atlantic Walrus	Special Concern	Pending	DFO
Beluga Whale (Cumberland Sound population)	Threatened	Pending	DFO
Beluga Whale (Eastern Hudson Bay population)	Endangered	Pending	DFO
Beluga Whale (Western Hudson Bay population)	Special Concern	Pending	DFO
Beluga Whale (Eastern High Arctic – Baffin Bay population)	Special Concern	Pending	DFO
Bowhead Whale (Eastern Canada – West Greenland population)	Special Concern	Pending	DFO
Bowhead Whale (Eastern Arctic population)	Endangered	Schedule 2	DFO

Killer Whale (Northwest Atlantic / Eastern Arctic populations)	Special Concern	Pending	DFO
Grey Whale (Eastern North Pacific population)	Special Concern	Schedule 1	DFO
Humpback Whale (Western North Atlantic population)	Special Concern	Schedule 3	DFO
Narwhal	Special Concern	Pending	DFO
Fish			
Northern Wolffish	Threatened	Schedule 1	DFO
Atlantic Wolffish	Special Concern	Schedule 1	DFO
Bering Wolffish	Special Concern	Schedule 3	DFO
Fourhorn Sculpin	Special Concern	Schedule 3	DFO
Roundnose Grenadier	Endangered	Pending	DFO
Spotted Wolffish	Threatened	Schedule 1	DFO
Thorny Skate	Special Concern	Pending	DFO
Atlantic Cod, Arctic Lakes	Special Concern	Pending	DFO
Blackline Prickleback	Special Concern	Schedule 3	DFO

Notes: DFO: Fisheries and Oceans Canada; ECCC: Environment and Climate Change Canada; GN: Government of Nunavut

¹ The Department of Fisheries and Oceans has responsibility for aquatic species.

² Environment and Climate Change Canada has a national role to play in the conservation and recovery of Species at Risk in Canada, as well as responsibility for management of birds described in the Migratory Birds Convention Act (MBCA). Day-to-day management of terrestrial species not covered in the MBCA is the responsibility of the Territorial Government. Populations that exist in National Parks are also managed under the authority of the Parks Canada Agency.

³ The *anatum* subspecies of Peregrine Falcon is listed on Schedule 1 of SARA as threatened. The *anatum* and *tundrius* subspecies of Peregrine Falcon were reassessed by COSEWIC in 2007 and combined into one subpopulation complex. This subpopulation complex was assessed by COSEWIC as Special Concern.

Appendix C

Archaeological and Palaeontological Resources Terms and Conditions for Land Use Permit Holders



INTRODUCTION

The Department of Culture and Heritage (CH) routinely reviews land use applications sent to the Nunavut Water Board, Nunavut Impact Review Board and the Indigenous and Northern Affairs Canada. These terms and conditions provide general direction to the permittee/proponent regarding the appropriate actions to be taken to ensure the permittee/proponent carries out its role in the protection of Nunavut's archaeological and palaeontological resources.

TERMS AND CONDITIONS

- 1) The permittee/proponent shall have a professional archaeologist and/or palaeontologist perform the following **Functions** associated with the **Types of Development** listed below or similar development activities:

	Types of Development (See Guidelines below)	Function (See Guidelines below)
a)	Large scale prospecting	Archaeological/Palaeontological Overview Assessment
b)	Diamond drilling for exploration or geotechnical purpose or planning of linear disturbances	Archaeological/ Palaeontological Inventory
c)	Construction of linear disturbances, Extractive disturbances, Impounding disturbances and other land disturbance activities	Archaeological/ Palaeontological Inventory or Assessment or Mitigation

Note that the above-mentioned functions require either a Nunavut Archaeologist Permit or a Nunavut Palaeontologist Permit. CH is authorized by way of the *Nunavut and Archaeological and Palaeontological Site Regulations*¹ to issue such permits.

- 2) The permittee/proponent shall not operate any vehicle over a known or suspected archaeological or palaeontological site.

¹ P.C. 2001-1111 14 June, 2001

- 3) The permittee/proponent shall not remove, disturb, or displace any archaeological artifact or site, or any fossil or palaeontological site.
- 4) The permittee/proponent shall immediately contact CH at (867) 934-2046 or (867) 975-5500 should an archaeological site or specimen, or a palaeontological site or fossil, be encountered or disturbed by any land use activity.
- 5) The permittee/proponent shall immediately cease any activity that disturbs an archaeological or palaeontological site encountered during the course of a land use operation until permitted to proceed with the authorization of CH.
- 6) The permittee/proponent shall follow the direction of CH in restoring disturbed archaeological or palaeontological sites to an acceptable condition. If these conditions are attached to either a Class A or B Permit under the Territorial Lands Act Indigenous and Northern Affairs Canada directions will also be followed.
- 7) The permittee/proponent shall provide all information requested by CH concerning all archaeological sites or artifacts and all palaeontological sites and fossils encountered in the course of any land use activity.
- 8) The permittee/proponent shall make best efforts to ensure that all persons working under its authority are aware of these conditions concerning archaeological sites and artifacts and palaeontological sites and fossils.
- 9) If a list of recorded archaeological and/or palaeontological sites is provided to the permittee/proponent by CH as part of the review of the land use application the permittee/proponent shall avoid the archaeological and/or palaeontological sites listed.
- 10) Should a list of recorded sites be provided to the permittee/proponent, the information is provided solely for the purpose of the proponent's land use activities as described in the land use application, and must otherwise be treated confidentially by the proponent.

Legal Framework

As stated in Article 33 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement):

Where an application is made for a land use permit in the Nunavut Settlement Area, and there are reasonable grounds to believe that there could be sites of archaeological importance on the lands affected, no land use permit shall be issued without written consent of the Designated Agency. Such consent shall not be unreasonably withheld. [33.5.12]

Each land use permit referred to in Section 33.5.12 shall specify the plans and methods of archeological site protection and restoration to be followed by the permit holder, and any other conditions the Designated Agency may deem fit. [33.5.13]

Palaeontology and Archaeology

Under the *Nunavut Act*², the federal government can make regulations for the protection, care and preservation of palaeontological and archaeological sites and specimens in Nunavut. Under

² s. 51(1)

the *Nunavut Archaeological and Palaeontological Sites Regulations*³, it is illegal to alter or disturb any palaeontological or archaeological site in Nunavut unless permission is first granted through the permitting process.

Definitions

As defined in the *Nunavut Archaeological and Palaeontological Sites Regulations*, the following definitions apply:

“archaeological site” means a place where an archaeological artifact is found.

“archaeological artifact” means any tangible evidence of human activity that is more than 50 years old and in respect of which an unbroken chain of possession or regular pattern of usage cannot be demonstrated, and includes a Denesuline archaeological specimen referred to in section 40.4.9 of the Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada (Nunavut Agreement).

“palaeontological site” means a site where a fossil is found.

“fossil” includes:

Fossil means the hardened or preserved remains or impression of previously living organisms or vegetation and includes:

- (a) natural casts;*
- (b) preserved tracks, coprolites and plant remains; and*
- (c) the preserved shells and exoskeletons of invertebrates and the preserved eggs, teeth and bones of vertebrates.*

Guidelines for Developers for the Protection of Archaeological Resources in the Nunavut Territory

(Note: Partial document only, complete document at: www.ch.gov.nu.ca/en/Archaeology.aspx)

Introduction

The following guidelines have been formulated to ensure that the impacts of proposed developments upon heritage resources are assessed and mitigated before ground surface altering activities occur. Heritage resources are defined as, but not limited to, archaeological and historical sites, burial grounds, palaeontological sites, historic buildings and cairns. Effective collaboration between the developer, the Department of Culture, and Heritage (CH), and the contract archaeologist(s) will ensure proper preservation of heritage resources in the Nunavut Territory. The roles of each are briefly described.

CH is the Nunavut Government agency which oversees the protection and management of heritage resources in Nunavut, in partnership with land claim authorities, regulatory agencies, and the federal government. Its role in mitigating impacts of developments on heritage resources is as follows: to identify the need for an impact assessment and make recommendations to the appropriate regulatory agency; set the terms of reference for the study depending upon the scope of the development; suggest the names of qualified individuals

³ P.C. 2001-1111 14 June, 2001

prepared to undertake the study to the developer; issue an archaeologist or palaeontologist permit authorizing field work; assess the completeness of the study and its recommendations; and ensure that the developer complies with the recommendations.

The primary regulatory agencies that CH provides information and assistance to are the Nunavut Impact Review Board, for development activities proposed for Inuit Owned Lands (as defined in Section 1.1.1 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* (Nunavut Agreement)), and the Indigenous and Northern Affairs Canada, for development activities proposed for federal Crown Lands.

A developer is the initiator of a land use activity. It is the obligation of the developer to ensure that a qualified archaeologist or palaeontologist is hired to perform the required study and that provisions of the contract with the archaeologist or palaeontologist allow permit requirements to be met; i.e. fieldwork, collections management, artifact and specimen conservation, and report preparation. On the recommendation of the contract archaeologist or palaeontologist in the field and the Government of Nunavut, the developer shall implement avoidance or mitigative measures to protect heritage resources or to salvage the information they contain through excavation, analysis, and report writing. The developer assumes all costs associated with the study in its entirety.

Through his or her active participation and supervision of the study, the contract archaeologist or palaeontologist is accountable for the quality of work undertaken and the quality of the report produced. Facilities to conduct fieldwork, analysis, and report preparation should be available to this individual through institutional, agency, or company affiliations. Responsibility for the curation of objects recovered during field work while under study and for documents generated in the course of the study as well as remittance of artifacts, specimens and documents to the repository specified on the permit accrue to the contract archaeologist or palaeontologist. This individual is also bound by the legal requirements of the *Nunavut Archaeological and Palaeontological Sites Regulations*.

Types of Development

In general, those developments that cause concern for the safety of heritage resources will include one or more of the following kinds of surface disturbances. These categories, in combination, are comprehensive of the major kinds of developments commonly proposed in Nunavut. For any single development proposal, several kinds of these disturbances may be involved

- *Linear disturbances: including the construction of highways, roads, winter roads, transmission lines, and pipelines;*
- *Extractive disturbances: including mining, gravel removal, quarrying, and land filling;*
- *Impoundment disturbances: including dams, reservoirs, and tailings ponds;*
- *Intensive land use disturbances: including industrial, residential, commercial, recreational, and land reclamation work, and use of heritage resources as tourist developments.*

- *Mineral, oil and gas exploration: establishment of camps, temporary airstrips, access routes, well sites, or quarries all have potential for impacting heritage resources.*

Types of Studies Undertaken to Preserve Heritage Resources

Overview: An overview study of heritage resources should be conducted at the same time as the development project is being designed or its feasibility addressed. They usually lack specificity with regard to the exact location(s) and form(s) of impact and involve limited, if any, field surveys. Their main aim is to accumulate, evaluate, and synthesize the existing knowledge of the heritage of the known area of impact. The overview study provides managers with baseline data from which recommendations for future research and forecasts of potential impacts can be made. A Class I Permit is required for this type of study if field surveys are undertaken.

Reconnaissance: This is done to provide a judgmental appraisal of a region sufficient to provide the developer, the consultant, and government managers with recommendations for further development planning. This study may be implemented as a preliminary step to inventory and assessment investigations except in cases where a reconnaissance may indicate a very low or negligible heritage resource potential. Alternately, in the case of small-scale or linear developments, an inventory study may be recommended and obviate the need for a reconnaissance.

The main goal of a reconnaissance study is to provide baseline data for the verification of the presence of potential heritage resources, the determination of impacts to these resources, the generation of terms of reference for further studies and, if required, the advancement of preliminary mitigative and compensatory plans. The results of reconnaissance studies are primarily useful for the selection of alternatives and secondarily as a means of identifying impacts that must be mitigated after the final siting and design of the development project. Depending on the scope of the study, a Class 1 or Class 2 Permit is required for this type of investigation.

Inventory: A resource inventory is generally conducted at that stage in a project's development at which the geographical area(s) likely to sustain direct, indirect, and perceived impacts can be well defined. This requires systematic and intensive fieldwork to ascertain the effects of all possible and alternate construction components on heritage resources. All heritage sites must be recorded on Government of Nunavut Site Survey forms. Sufficient information must be amassed from field, library and archival components of the study to generate a predictive model of the heritage resource base that will:

- allow the identification of research and conservation opportunities;
- enable the developer to make planning decisions and recognize their likely effects on the known or predicted resources; and
- make the developer aware of the expenditures, which may be required for subsequent studies and mitigation. A Class 1 or 2 permit is required.

Assessment: At this stage, sufficient information concerning the numbers and locations of heritage resources will be available, as well as data to predict the forms and magnitude of impacts. Assessments provide information on the size, volume, complexity and content of a

heritage resource, which is used to rank the values of different sites or site types given current archaeological knowledge. As this information will shape subsequent mitigation program(s), great care is necessary during this phase.

Mitigation: This refers to the amelioration of adverse impacts to heritage resources and involves the avoidance of impact through the redesign or relocation of a development or its components; the protection of the resource by constructing physical facilities; or, the scientific investigation and recovery of information from the resource by excavation or other method. The type(s) of appropriate mitigative measures are dictated by their viability in the context of the development project. Mitigation strategies must be developed in consultation with, and approved by, the Department of Culture and Heritage. It is important to note that mitigation activities should be initiated as far in advance of the construction of the development as possible.

Surveillance and monitoring: These may be required as part of the mitigation program.

Surveillance may be conducted during the construction phase of a project to ensure that the developer has complied with the recommendations.

Monitoring involves identification and inspection of residual and long-term impacts of a development (i.e. shoreline stability of a reservoir); or the use of impacts to disclose the presence of heritage resources, for example, the uncovering of buried sites during the construction of a pipeline.