



SCREENING DECISION REPORT NIRB FILE No.: 16YN010

NPC File No.: 149020

Related to NPC File Nos.: 148222, 148582 and 148671

April 15, 2019

Following the Nunavut Impact Review Board's (NIRB or Board) assessment of all materials provided, the NIRB is recommending that a review of University of Colorado's "Ancient DNA in Lake Sediment" is not required pursuant to Article 12, Section 12.4.4(a) of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada (Nunavut Agreement)* and s. 92(1)(a) of the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14, s. 2 (*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 accepts this Screening Decision Report.

OUTLINE OF SCREENING DECISION REPORT

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The primary objectives of the NIRB are set out in Article 12, Section 12.2.5 of the *Nunavut Agreement* and are confirmed by s. 23 of the *NuPPAA*:

Nunavut Agreement, Article 12, Section 12.2.5: 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.

The purpose of screening is provided for under Article 12, Section 12.4.1 of the *Nunavut Agreement* and s. 88 of the *NuPPAA* which states:

NuPPAA, s. 88: 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 Article 12, Section 12.4.2(a) and (b) of the *Nunavut Agreement* and s. 89(1) of *NuPPAA* which states:

NuPPAA, s. 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 under Article 12, Section 12.4.2(c) and s. 89(2) of the *NuPPAA* provides that the considerations set out in s.89(1)(a) prevail over the considerations set out in s. 89(1)(b) of the *NuPPAA*.

As set out under Article 12, Section 12.4.4 of the *Nunavut Agreement* and s. 92(1) of the *NuPPAA*, upon conclusion of the screening process, the Board must provide its written report the Minister. The contents of the NIRB's report are specified under *NuPPAA*:

NuPPAA, s. 92(1): The Board must submit a written report to the responsible Minister containing a description of the project that specifies its scope and indicating that:

- (a) a review of the project is not required;
- (b) a review of the project is required; or
- (c) the project should be modified or abandoned.

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 pursuant to paragraph 92(2)(a) of *NuPPAA* as follows:

NuPPAA, s. 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 January 22, 2019 the NIRB received a referral to screen University of Colorado's "Ancient DNA in Lake Sediment" 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 February 24, 2017 and December 19, 2017 for the activities associated with the current proposal continues to apply and has determined that the project proposal is a significant modification to the project because it includes a new lake near Pond Inlet.

Pursuant to Article 12, Sections 12.4.1 and 12.4.4 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada (Nunavut Agreement)* and section 87 of the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14, s. 2 (*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 **16YN010**, the NIRB viewed this project proposal as an amendment to the previously screened project and assigned this proposal with this previous file number. Please reference this file number in all future related correspondence. A summary of the previously screened project activities can be found in [Appendix A](#).

PROJECT OVERVIEW & THE NIRB ASSESSMENT PROCESS

1. Information Requests and Suspension of Assessment

On January 22, 2019 the NIRB requested that the Proponent complete the online application form through the NIRB's public registry system and ensure, pursuant to s. 144(1) of the *NuPPAA*, that the information provided be sufficient to determine the scope of the project activities being proposed and that sufficient information has been provided to commence screening. On February 7, 2019 and on February 26, 2019 the NIRB followed up with the Proponent requesting an online application, which was received on March 7, 2019. Following a preliminary completeness check of the proposal as submitted, the NIRB determined that the proposal did not contain the necessary information for the NIRB to carry out its screening and on March 8, 2019 requested that the

Proponent provide the Board with the additional information in order to carry out the screening of the project proposal.

On March 14, 2019 the NIRB received the required additional information and commenced the screening pursuant to Part 3 of the *NuPPAA*.

2. Project Scope

All documents received and pertaining to this project proposal can be accessed from the NIRB's online public registry at www.nirb.ca/project/125447.

The "Ancient DNA in Lake Sediment" project activities as previously screened by the NIRB (File No. 16YN010) included taking lake sediment samples from lakes near Iqaluit, Clyde River and Qikiqtarjuaq to analyze for ancient DNA to reconstruct past vegetation types, and species diversity and reveal past summer temperatures. A complete description of the scope of activities previously approved has been included within [Appendix A](#).

The University of Colorado is currently proposing to amend the "Ancient DNA in Lake Sediment" project; which would be located in the Qikiqtani Region in the same areas as previously approved, approximately 16 kilometres (km) from Clyde River with an addition of one (1) new location approximately 35 km southwest of Pond Inlet. The current program is proposed to take place from May to August 2019.

As required under s. 86(1) of the *NuPPAA*, the Board accepts the scope of the "Ancient DNA in Lake Sediment" project as set out by University of Colorado in the proposal. The scope of the project proposal includes the following undertakings, works, or activities:

- Use of all-terrain vehicles (ATVs), snowmobiles and helicopter to transport research personnel and equipment to sampling sites;
- Establishment of temporary camps to provide accommodation for research personnel during fieldwork;
- Undertake sampling and research activities in two (2) natural lakes:
 - Use of ice auger to drill through lake ice to collect water and lake-bottom sediment samples;
 - Mapping of vegetation around the lakes;
 - Installation of thermometers to record air, soil and water temperatures;
- Transport, storage and use of 180 litres of gasoline to support snowmobile operations and cooking;
- Use of water from lakes for domestic purposes;
- Burial of sewage generated from the camp; and
- Hiring of local community members for logistical support.

3. 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.

4. Key Stages of the Screening Process

The following key stages were completed:

Date	Stage
January 22, 2019	Receipt of project proposal and positive conformity determination (North Baffin Land Use Plan) from the NPC
January 22, 2019 & February 26, 2019	Information requests
March 14, 2019	Proponent responded to information requests
March 14, 2019	Scoping pursuant to s. 86(1) of the <i>NuPPAA</i>
March 19, 2019	Public engagement and comment request
March 29, 2019	Receipt of public comments

5. Public Comments and Concerns

Notice regarding the NIRB's screening of this project proposal was distributed on March 19, 2019 to community organizations in Clyde River and Pond Inlet, 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 the NIRB's *proposed* project-specific terms and conditions, and provide the Board with any comments or concerns by March 29, 2019 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; and if so, why;
- Whether the project proposal is of a type where the potential adverse effects are highly predictable and mitigable with known technology, (and providing any recommended mitigation measures); and
- Any matter of importance to the Party related to the project proposal.

On or before March 29, 2019 the NIRB received comments from the following interested parties (see Summary of Comments and Concerns section below):

- **Government of Nunavut (GN)**
- **Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**
- **Environment and Climate Change Canada (ECCC)**

On April 1, 2019, the GN provided revised comments for consideration for this project proposal.

a. Summary of Public Comments and Concerns Received during the Public comment period of this file

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

Government of Nunavut (GN)

- Project will not likely lead to destruction of wildlife habitat and recommended the following to mitigate potential adverse effects related to wildlife disturbance:
 - Ensure that wildlife will not be harassed or disturbed;
 - Cease project activities when caribou are observed to be approaching the project area; and
 - Maintain a minimum aircraft flight altitude of 610m above ground level and 600m horizontal distance from caribou.
- Recommended the Proponent obtain a Wildlife Research Permit from the GN prior to the commencement of any vegetation related research activities.
- Noted that four (4) archaeological sites have been recorded near the proposed activities and noted concern that the transportation activities would occur during periods that the snow cover might mask recorded and unrecorded archaeological sites.
- Recommended the following to mitigate impacts to archaeological sites
 - The Proponent exercises caution in their movements in the area, specifically with regards to placement of the camp site.
 - Avoid conducting activities in the vicinity (50 metres buffer zone) of any archaeological/historical sites.
 - If archaeological sites or features are encountered, activities should immediately be interrupted and moved away from this location, with locations recorded and report to the GN office.
 - No artifacts shall be removed without proper authorizations and the building of inuksuit is not recommended.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)

- Recommended that the Proponent describe and document the efforts taken to inform the communities of Pond Inlet and Clyde River about the proposed project and how it intends to share the results of its project activities with the community members.
- Has no further comments or additional terms and conditions to recommend with the understanding that the previously recommended terms and conditions will continue to apply for this proposal.

Environment and Climate Change Canada (ECCC)

- No information provided on spill contingency measures for the usage of fuel and recommended that the Proponent use secondary containment for storage and have an appropriate spill kit available at the project site for the required fuel.

b. 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.

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 s. 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:

Factor	Comment
The size of the geographic area, including the size of wildlife habitats, likely to be affected by the impacts.	<ul style="list-style-type: none">▪ The proposed project would be carried out approximately 16 km from Clyde River and approximately 35 km from Pond Inlet.▪ Proposed activities may take place within habitats for many far-ranging wildlife species including wolves, wolverine, migratory birds and non-migratory birds, and Species at Risk (Polar Bears), and may potentially affect animal migratory patterns.
The ecosystemic sensitivity of that area.	<ul style="list-style-type: none">▪ No specific areas of ecosystemic sensitivity have been identified by the Proponent within the physical footprint of the proposed project.
The historical, cultural and archaeological significance of that area.	<ul style="list-style-type: none">▪ No specific areas of historical, cultural and archaeological significance have been identified by the Proponent within the physical footprint of the proposed project.▪ The GN has identified 4 archeological sites in the vicinity of the proposed project areas.
The size of the human and the animal populations likely to be affected by the impacts.	<ul style="list-style-type: none">▪ The proposed project may take place within the habitat of a number of species identified above and as such, may potentially affect wildlife, their habitat and their migratory patterns. Human population and/or traditional land activities may be affected

Factor	Comment
	as the nearest community to the proposed project is 16 km away.
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.	<ul style="list-style-type: none"> A zone of influence of up to 20 km from the most potentially-disruptive project activities was selected for the NIRB's assessment. With adherence to the relevant regulatory requirements and application of the mitigation measures recommended by the NIRB, no significant residual effects are expected to occur.
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.	<ul style="list-style-type: none"> The mitigation measures recommended by the NIRB have been designed with consideration for the potential for cumulative effects to result from the impacts of the project combined with other past, present and reasonably foreseeable projects.
Any other factor that the Board considers relevant to the assessment of the significance of impacts.	<ul style="list-style-type: none"> No other relevant factors were identified.

Other past, present and reasonably foreseeable projects considered in this assessment:

NIRB Number	Project Title	Project Type
<i>Proposed Developments – undergoing assessment</i>		
19AN004	Bylot Island Multi-Day Hike	Tourism
<i>Present Projects – approved or in operation</i>		
17QN015	Pond Inlet 2017 Quarry Administration Agreement	Pits and Quarries
17XN030	Pond Inlet Marin Infrastructure	Infrastructure
<i>Past Projects</i>		
16TN052	MS SILVER CLOUD Arctic and Greenland Expedition Cruise (Voyage 1819, 18 August-03 September 2018) and Canada New England Expedition Cruise (Voyage 1820, 03-18 September 2018)	Tourism
17AN031	Canada C3 led by the Students on Ice Foundation	Tourism
17TN057	MY Archimedes Northwest Passage 2017	Tourism
17YN003	GEM-2 North Baffin Bedrock Mapping Project	Research
17YN014	Onshore Stratigraphy Studies, Northwest Baffin Bay	Research
17YN041	A Coastal, Pan-Canadian Collection of plants, microalgae and marine invertebrates for the	Research

NIRB Number	Project	Project Title	Project Type
		Canadian Museum of Nature, as part of Canada C3	
17YN050		Preservation of Organic Matter in Early Diagenetic Chert	Research
17YN069		Effects of Anthropogenic Stressors on Arctic Seabirds	Research
18TN035		MS FRAM The Northwest Passage – In The Wake of Great Explorers	Tourism
18YN007		Climate – Terrestrial Biodiversity Investigation of Tundra Vegetation and Sediment of Lakes/Ponds along an Arctic Latitudinal Gradient	Research
18YN008		Spatially Distributed Modelling of Carbon, Water and Nutrient Fluxes for Arctic Community Source Water Catchment	Research
18YN017		ATKA Expedition	Research
18YN029		URI Northwest Passage Project 2018	

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.

Ecosystem, wildlife habitat and Inuit harvesting activities:

- Potential adverse impacts to migratory patterns of animals including birds, Polar Bears, wolves and wolverines due to research activities including noise disturbance associated with the transport of personnel and research equipment to the proposed project sites. The potential for impacts is applicable to a small geographic area encompassing travel to two (2) lakes near Clyde River and Pond Inlet, the establishment of a temporary camp and the research sites within the lakes. The potential for impacts are considered to be limited due to infrequent activities and any resulting impacts would be expected to be reversible and temporary in nature. The potential adverse impacts may be mitigated by measures such as requiring the Proponent to avoid nesting areas of migratory birds, avoid critical wildlife areas and ensure not to harass wildlife. The Board has previously issued terms and conditions 8 through 12, and 19 to mitigate potential adverse impacts to terrestrial wildlife, migratory birds and non-migratory birds which continue to apply to the current project proposal.
- Potential adverse impacts to surface water quality, fish and fish habitat, soil and vegetation from the establishment of temporary camps, potential fuel spills, disposal of sewage, and greywater at the temporary camps, use of ATVs, boats and snowmobiles, and general

research activities. The Board has previously recommended terms and conditions to mitigate potential adverse impacts to surface water, soil and vegetation, specifically: 5 through 7, 13 through 15, 20, 22 and 23 which continue to apply to the current project proposal.

- Potential adverse impacts to public and traditional land use activities in the area due to transportation of personnel and equipment to the two (2) lakes and associated research and camping activities. The Proponent has committed to working with local community members in navigating and transporting to the proposed project sites. The Board previously issued term and condition 8 through 12 to minimize potential interference with the movement of birds and wildlife, term and condition 16 to ensure that the affected communities and organizations are consulted on the project proposal. Further, term and condition 17 has been previously recommended to ensure that available Inuit Qaujimaningit can inform project activities and to ensure the project activities do not interfere with Inuit wildlife harvesting or traditional land use activities in the area. These terms and conditions will continue to apply to the current project proposal.
- The Proponent will also be required to follow the specific Acts and Regulations as applicable for this project proposal (see Regulatory Requirements section) to mitigate the potential adverse impacts of the project proposal to the valued component as discussed above.

Socio-economic effects on northerners:

- Potential adverse impacts to historical, cultural and archaeological sites from research activities. The GN has noted that there are known archeological sites in the vicinity of the proposed project. However, the Proponent would be required to contact the Department of Culture and Heritage when encountering historical sites and is required to follow the *Nunavut Act*. Term and condition 16 was previously recommended to ensure that available Inuit Qaujimaningit can inform project activities, and reduce the potential for negative impacts occurring to any historical sites which continues to apply to the current project proposal.
- Potential positive impacts to the local community from the purchasing of local goods and services and the hiring of local guides to assist in transportation and in research activities. It is noted that the Proponent has committed to work with the local community to hire guides to assist with the proposed research activities. This would allow the community to increase the local economy and expenditures within the community. Term and condition 16 was previously recommended by the Board and continues to apply to the proposed activities to ensure the Proponent continues to inform the community of the research activities and findings as well as provide community members with information to ensure a successful local hiring opportunity.

Significant public concern:

- No significant public concern was expressed during the public commenting period for this file. Follow up consultation and involvement of local community members is expected to mitigate any potential for public concern resulting from project activities. Term and

condition 16 was previously recommended by the Board and continues to apply to the proposed activities 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.

Technological innovations for which the effects are unknown:

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

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 following project-specific terms and conditions have been recommended: 1-4, 18, 21 and 24.

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 April 18, 2016 Screening Decision Report for File No. **16YN010**, **and continue to apply to the Ancient DNA in Lake Sediment project:**

General

1. The University of Colorado (the Proponent) shall maintain a copy of the Project Terms and Conditions at the site of operation at all times.
2. The Proponent shall forward copies of all permits obtained and required for this project to the Nunavut Impact Review Board (NIRB) prior to the commencement of the project.
3. The Proponent shall operate in accordance with all commitments stated in correspondence provided to the Nunavut Planning Commission (Application to Determine Conformity, Project Description, February 25, 2016), and the NIRB (Part 1 Summary Application Form, Non-technical summary, Description of Environmental Impacts, February 29, 2016; Part 1 Summary Application Form in Inuktitut, March 10, 2016).
4. The Proponent shall operate the site in accordance with all applicable Acts, Regulations and Guidelines.

Fuel and Chemical Storage

5. The Proponent shall ensure that re-fueling of all equipment occurs a minimum of thirty-one (31) metres away from the high water mark of any water body, unless otherwise authorized by the Nunavut Water Board.
6. The Proponent shall ensure that appropriate spill response equipment and clean-up materials (e.g., shovels, pumps, barrels, drip pans, and absorbents) are readily available during any transfer of fuel or hazardous substances.

7. The Proponent shall ensure that all personnel are properly trained in fuel and hazardous waste handling procedures, as well as spill response procedures. All spills of fuel or other deleterious materials of any amount must be reported immediately to the 24 hour Spill Line at (867) 920-8130.

Wildlife - General

8. The Proponent shall ensure that there is no damage to wildlife habitat in conducting this operation.
9. The Proponent shall not harass wildlife. This includes persistently worrying or chasing animals, or disturbing large groups of animals. The Proponent shall not hunt or fish, unless proper Nunavut authorizations have been acquired.
10. 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

11. The Proponent shall not disturb or destroy the nests or eggs of any birds. If nests are encountered and/or identified, the Proponent shall take precaution to avoid further interaction and or disturbance (e.g., a 100 metre buffer around the nests). If active nests of any birds are discovered (i.e., with eggs or young), the Proponent shall avoid these areas until nesting is complete and the young have left the nest.

Caribou Disturbance

12. The Proponent shall cease activities that may interfere with the migration or calving of caribou, until the caribou have passed or left the area.

Land Use

13. The Proponent shall ensure that the land use area is kept clean and tidy at all times.

Restoration of Disturbed Areas

14. The Proponent shall remove all garbage, fuel, and equipment following each day of field work.
15. 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

16. The Proponent should, to the extent possible, hire local people and to consult with local residents regarding their activities in the area and available Inuit Qaujimaningit that can inform project activities
17. The Proponent shall ensure that project activities do not interfere with Inuit wildlife harvesting or traditional land use activities.

The following additional terms and conditions were previously issued by the NIRB in the July 14, 2017 Screening Decision Report for File No.: **16YN010, and continue to apply to the Ancient DNA in Lake Sediment project:**

General

18. The Proponent shall operate in accordance with all commitments stated in correspondence provided to the Nunavut Planning Commission (Application to Determine Conformity, May 31, 2017), and the NIRB (Non-technical summary, June 13, 2017; Map, June 14, 2017; Online Application Form, June 14, 2017).

Waste Disposal

19. 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.

Ground Disturbance

20. The Proponent shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. Overland travel of equipment or vehicles must be suspended if rutting occurs.

The following additional terms and conditions were previously issued by the NIRB in the February 6, 2018 Screening Decision Report for File No.: **16YN010, and continue to apply to the Ancient DNA in Lake Sediment project:**

General

21. The Proponent shall operate in accordance with all commitments stated in correspondence provided to the Nunavut Planning Commission (Application to Determine Conformity, December 19, 2017), and the NIRB (Online Application Form, January 10, 2018).

Temporary Camps and Land Use

22. The Proponent shall ensure that all camps are located on gravel, sand or other durable land.
23. The Proponent shall not erect camps or store material on the surface ice of lakes or streams

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

General

24. The Proponent shall operate in accordance with all commitments stated in correspondence provided to the Nunavut Planning Commission (NPC File No.: 149020), and the NIRB (Online Application Form, March 14, 2019).

OTHER NIRB CONCERNS AND RECOMMENDATIONS

In addition to the project-specific terms and conditions, the Board has previously recommended the following on April 18, 2016, July 14, 2017 and February 6, 2018:

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. (updated) 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. (updated) Any problem wildlife or any interaction with carnivores should be reported immediately to the local Government of Nunavut, Department of Environment Conservation Office (Wildlife Officer of the Pond Inlet office, phone: (867) 899-8819).

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/>.

The Board previously recommended in the April 18, 2016, July 14, 2017 and February 6, 2018 Screening Decision Reports for the Ancient DNA in Lake Sediment project the following legislation, which continues to apply to the current proposal:

Acts and Regulations

1. The *Fisheries Act* (<http://laws-lois.justice.gc.ca/eng/acts/F-14/index.html>).
2. (updated) 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. (updated) 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>).
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**.

CONCLUSION

The foregoing constitutes the Board's screening decision with respect to the University of Colorado's "Ancient DNA in Lake Sediment". The NIRB remains available for consultation with the Minister regarding this report as necessary.

Dated April 15, 2019 at Baker Lake, NU.

A handwritten signature in black ink, appearing to read "M. Kavik Kaluraq", is written over a light blue horizontal line.

Marjorie Kavik Kaluraq, Acting 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.: 16YN010), was received by the Nunavut Impact Review Board (NIRB or Board) from the Nunavut Planning Commission (NPC or Commission) on February 25, 2016, which noted that his project was located outside of an applicable regional land use plan. The project proposal 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)* and Section 3 of the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14, s. 2 (*NuPPAA*). On April 18, 2016 the NIRB issued a screening decision pursuant to p. 92(2)(a) of the *NuPPAA* to the Minister Responsible for Nunavut Arctic College which indicated that the proposed project could proceed subject to the NIRB's recommended project-specific terms and conditions.

The University of Colorado's (Proponent) original "Ancient DNA in Lake Sediment" project was located in the Qikiqtani region, approximately 20 kilometres (km) southeast of Iqaluit. The Proponent indicated that it intended to conduct lake sediment sampling at three (3) separate study sites for testing of benthic organisms. The program was proposed to take place in April 2016.

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

- Extraction of six (6) (total) lake sediment core samples, six (6) centimetres in diameter and one (1) metre in length, from three (3) lake study sites using a mobile ice auger and a sediment corer;
- Disposal of waste and accommodations for two (2) personnel in Iqaluit;
- Transportation to and from study sites via snowmobile;
- Storage and use of five (5) litres of fuel for ice auger; and
- Hiring of a local community member for logistical support.

Additional authorization and amendment requests associated with the "Ancient DNA in Lake Sediment" project have also been reviewed by the NIRB following screening of the original project proposal (File No. 16YN010). In each instance, the NIRB re-issued the original terms and conditions recommended in the original April 18, 2016 Screening Decision Report and issued additional terms and conditions associated with the Project as per p. 92(2)(a) of the *NuPPAA*. The following is a summary of the previously screened project activities as received by the NIRB:

- 1) The scope of the activities and components associated with the March 31, 2017 amendment application included:
 - Use of all-terrain vehicles, inflatable boat, or on foot to transport three (3) personnel and equipment from Clyde River or Iqaluit to study sites in order to:
 - Extract lake sediment samples with steel coring device (eight (8) centimetres in diameter and one and a half (1.5) metres in length;
 - Aluminum tripod (half a metre (0.5) in diameter and (2) metres in length)
 - Use of fuel to operate the all-terrain vehicle or boat sourced locally;
 - Hiring of local guides to transport personnel to the project sites; and
 - Accommodations and use of local facilities for up to three (3) personnel in Clyde River and Iqaluit.

- 2) The scope of the activities and components associated with the February 6, 2018 amendment application included:
- Use of snowmobiles during winter season and boats during summer season to transport research personnel and equipment to sampling sites;
 - Use of a rental cabin or establishment of temporary camps to provide accommodation for research personnel during fieldwork;
 - Undertake sampling and research activities in three (3) natural lakes:
 - Use of ice auger to drill through lake ice to collect water and lake-bottom sediment samples;
 - Mapping of plants around the lakes;
 - Installation of thermometers to record air, soil and water temperatures;
 - Deployment of a weather station to collect weather data for one (1) year;
 - Transportation, storage and use of 100 litres of gasoline to support snowmobile and camp operations; and
 - Burial of sewage generated from the camp.

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: November 2018

Terrestrial Species at Risk¹	COSEWIC Designation	Schedule of SARA	Government Organization with Primary Management Responsibility²
Migratory Birds			
Buff-breasted Sandpiper	Special Concern	Schedule 1	Environment and Climate Change Canada (ECCC)
Common Nighthawk	Threatened	Schedule 1	ECCC
Eskimo Curlew	Endangered	Schedule 1	ECCC
Harlequin Duck	Special Concern	Schedule 1	ECCC
Harris's Sparrow	Special Concern	Schedule 1	ECCC
Horned Grebe	Special Concern	Schedule 1	ECCC
Ivory Gull	Endangered	Schedule 1	ECCC
Olive-sided Flycatcher	Special Concern	Schedule 1	ECCC
Red Knot Islandica Subspecies	Special Concern	Schedule 1	ECCC
Red-necked Phalarope	Special Concern	No Schedule	ECCC
Ross's Gull	Threatened	Schedule 1	ECCC
Rusty Blackbird	Special Concern	Schedule 1	ECCC
Short-eared Owl	Special Concern	Schedule 1	ECCC
Vegetation			
Porsild's Bryum	Threatened	Schedule 1	Government of Nunavut (GN)
Arthropods			
Transverse Lady Beetle	Special Concern	No Schedule	GN
Terrestrial Wildlife			
Caribou (Dolphin and Union Population)	Endangered	Schedule 1	GN
Caribou (Barren-ground Population)	Threatened	No Schedule	GN
Caribou (Torngat Mountains Population)	Endangered	No Schedule	GN
Grizzly Bear (Western Population)	Special Concern	Schedule 1	GN
Peary Caribou	Threatened	Schedule 1	GN
Polar Bear	Special Concern	Schedule 1	GN
Wolverine	Special Concern	Schedule 1	GN
Marine Wildlife			
Atlantic Walrus (High Arctic Population)	Special Concern	No Schedule	Fisheries and Oceans Canada (DFO)
Atlantic Walrus (Central/Low Arctic Population)	Special Concern	No Schedule	DFO
Beluga Whale (Cumberland Sound Population)	Threatened	Schedule 1	DFO
Beluga Whale (Eastern Hudson Bay Population)	Endangered	No Schedule	DFO
Beluga Whale (Eastern High Arctic-Baffin Bay Population)	Special Concern	No Schedule	DFO

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

² Environment and Climate Change Canada (ECCC) 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.

Terrestrial Species at Risk¹	COSEWIC Designation	Schedule of SARA	Government Organization with Primary Management Responsibility²
Beluga Whale (Western Hudson Bay Population)	Special Concern	No Schedule	DFO
Fish			
Atlantic Cod (Arctic Lakes Population)	Special Concern	No Schedule	DFO
Fourhorn Sculpin (Freshwater Form)	Data Deficient	Schedule 3	DFO
Lumpfish	Threatened	No Schedule	DFO
Thorny Skate	Special Concern	No Schedule	DFO

APPENDIX C: ARCHAEOLOGICAL AND PALAEOONTOLOGICAL 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*³ to issue such permits.

³ P.C. 2001-1111 14 June, 2001

- 2) The permittee/proponent shall not operate any vehicle over a known or suspected archaeological or palaeontological site.
- 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*⁴, the federal government can make regulations for the protection, care and preservation of palaeontological and archaeological sites and specimens in Nunavut. Under the *Nunavut Archaeological and Palaeontological Sites Regulations*⁵, 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

⁴ s. 51(1)

⁵ P.C. 2001-1111 14 June, 2001

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 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.