**SCREENING DECISION REPORT**
**NIRB FILE NO.: 08YN010**

NRI File No.: 0200614R-M

May 2, 2014

The Honourable Paul Quassa
Minister Responsible for Nunavut Arctic College
Government of Nunavut
P.O. Box 2410
Iqaluit, NU X0A 0H0

*Sent via email*: pquassa@gov.nu.ca, mkunuk2@gov.nu.ca

**Re: Screening Decision for the University of Ottawa – Luke Copland's Amendment Request with the Nunavut Research Institute for its "Northern Ellesmere Ice Shelves", North Baffin Region, Additional Application Terms and Conditions, NIRB File No. 08YN010**

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Dear Mr. Quassa:

The primary objectives of the Nunavut Impact Review Board (NIRB) are set out in section 12.2.5 of the Nunavut Land Claims Agreement (NLCA) 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.*"

Section 12.4.3 of the NLCA states that:

> "*Any application for a component or activity of a project proposal that has been permitted to proceed in accordance with these provisions shall be exempt from the requirement for screening by NIRB unless:*
>
> *(a) such component or activity was not part of the original project proposal; or*
>
> *(b) its inclusion would significantly modify the project.*"

## NIRB ASSESSMENT AND DECISION

The NIRB has completed a review of the University of Ottawa – Luke Copland's request to the Nunavut Research Institute (NRI) for an amendment to their Scientific Research License for their "Northern Ellesmere Ice Shelves" project (NRI File No.: 0200614R-M).

After a thorough assessment of the project proposal, the amendment application information and the comments received (please see *Procedural History* and *Project Activities* in **Appendix A)**, in accordance with Section 12.4.3 of the NLCA, the Board has determined that this request will result in a change to the original scope of the project. Therefore, the NIRB is re-issuing the recommended project-specific terms and conditions contained in the January 27, 2009 Screening Decision, NIRB file No.: 08YN010 in addition to new terms and conditions which are designed to mitigate any potential impacts to the environment as per Section 12.4.4(a) of the NLCA.

## ***PREVIOUSLY APPROVED*** PROJECT-SPECIFIC TERMS AND CONDITIONS

The following terms and conditions were previously approved by the NIRB for file **08YN010** in a Screening Decision Report dated March 26, 2008 and are available on the NIRB's online public registry using the following link:

http://ftp.nirb.ca/01-SCREENINGS/COMPLETED%20SCREENINGS/2008/08YN010-Luke%20Copland/.

### General

1. Mr. Luke Copland (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 to the NIRB obtained and required for this project prior to the commencement of the project.
3. The NIRB shall be notified of any changes in operating plans or conditions associated with this project prior to any such change.
4. The Proponent shall operate in accordance with all commitments stated in the application provided to Nunavut Research Institute and the Nunavut Planning Commission**.**
5. The Proponent shall operate the project sites in accordance with all applicable Acts, Regulations and Guidelines.

### Fuel and Chemical Storage

6. The Proponent shall locate all fuel and chemicals/ hazardous materials on the land with a minimum of thirty (30) metres away from the high water mark of any water body and in such a manner as to prevent their release into the environment.
7. If fuel and chemicals/ hazardous materials have to be used on ice in conduction this research, all the residual maters and containers must be removed from ice when project activities are accomplished.

### Restoration

8. The Proponent shall remove all garbage, fuel barrels and debris upon abandonment.
9. The Proponent shall complete all clean-up and restoration of the lands/ice used prior to the expiry date of the permit.

The following additional terms and conditions were previously recommended by the NIRB for file 08YN010 in a Screening Decision Report dated January 27, 2009:

**Water**

1. The Proponent shall not use water, including constructing or disturbing any stream, lakebed or the banks of any definable water course unless approved by the Nunavut Water Board.

**Waste**

2. The Proponent shall incinerate all combustible wastes daily, and remove the ash from incineration activities and non-combustible wastes from the project site to an approved facility for disposal.
3. The Proponent shall keep all garbage and debris in bags placed in a covered metal container or equivalent until disposed of. All wastes must be kept inaccessible to wildlife at all times.

**Fuel and Chemical Storage**

4. The Proponent shall ensure that all fuel caches are removed at the end of each field season.
5. The Proponent shall use secondary containment, such as self-supporting insta-berms, when storing barrelled fuel on location rather than relying on natural depressions. The Proponent shall also ensure that a spill kit is located at every fuel cache.
6. The Proponent shall use drip pans, or other similar preventative measures when refueling equipment on site.
7. The Proponent shall store all fuel and chemicals in such a manner that they are inaccessible to wildlife.
8. The Proponent shall ensure that all on site personnel are properly trained in fuel handling procedures as well as spill response procedures. All spills of fuel or other deleterious materials, regardless of quantity, must be reported immediately to the 24 hour Spill Line at (867) 920-8130.

**Wildlife**

9. The Proponent shall ensure that there is no damage to wildlife habitat in conducting this operation.
10. 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.
11. The Proponent shall ensure all project staff are trained in appropriate bear/carnivore detection and deterrent techniques.

**Other**

12. The Proponent should, to the extent possible, hire local people and to consult with local residents regarding their activities in the region.

## ***NEW*** RECOMMENDED PROJECT-SPECIFIC TERMS AND CONDITIONS (pursuant to Section 12.4.4(a) of the NLCA)

The Board is recommending that the following or similar ***additional*** project-specific terms and conditions be imposed upon the Proponent through all relevant legislation:

**General**

13. The Proponent shall operate in accordance with all commitments stated in additional correspondence provided to Nunavut Research Institute (Amendment Request for Scientific Research Licence, (February 20, 2014) and Nunavut Planning Commission (Conformity Questionnaire, March 28, 2014).

**Aircraft Flight Restrictions**

14. The Proponent shall restrict aircraft activity related to the project to a minimum altitude of 610 metres above ground level unless there is a specific requirement for low-level flying, which does not disturb wildlife and migratory birds.
15. The Proponent shall ensure that aircraft maintain a vertical distance of 1000 metres and a horizontal distance of 1500 metres from any observed groups (colonies) of migratory birds. Aircraft should avoid critical and sensitive wildlife areas at all times by choosing alternate flight corridors.
16. The Proponent shall ensure that aircraft do not, unless for emergency, touch-down in areas where wildlife are present.
17. 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.

## OTHER NIRB CONCERNS AND RECOMMENDATIONS

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

**Nunavut Planning Commission**

1. As a result of the potential for associated cumulative effects on migratory birds and wildlife resulting from the increased use of flights over Ellesmere Island and other islands in the North Baffin region, the Nunavut Planning Commission and territorial and federal government agencies should work together with the Regional Inuit Associations and other regulatory agencies to identify the potential cumulative effects of flights on migratory birds and wildlife resulting from flights from both a localized and regional scale and, where possible, outline appropriate mitigation measures.

## REGULATORY REQUIREMENTS

The Proponent has been previously advised that the following legislation may apply to the project:

1. The *Fisheries Act* (http://laws.justice.gc.ca/en/showtdm/cs/F-14///en).
2. The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (http://www.canlii.org/ca/sta/n-28.8/whole.html).
3. The *Migratory Birds Convention Act* and *Migratory Birds Regulations* (http://laws.justice.gc.ca/en/showtdm/cs/M-7.01).

4. The *Species at Risk Act* (http://laws.justice.gc.ca/en/showtdm/cs/S-15.3). Attached in **Appendix B** is a list of Species at Risk in Nunavut.

5. The *Nunavut Wildlife Act* which 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.justice.gc.ca/en/showtdm/cs/N-28.6). The Proponent must comply with the proposed terms and conditions listed in the attached **Appendix C.**

7. The *Navigable Waters Protection Act (NWPA)* (http://laws.justice.gc.ca/en/N-22/index.html).

In addition, the Proponent is also advised that the following legislation may apply to the project:

8. The *Aeronautics Act* (http://laws-lois.justice.gc.ca/eng/acts/A-2/).

**Validity of Land Claims Agreement**

*Section 2.12.2*
Where there is any inconsistency or conflict between any federal, territorial and local government laws, and the Agreement, the Agreement shall prevail to the extent of the inconsistency or conflict.

Dated ____May 2, 2014___at Churchill, MB.

_____
Elizabeth Copland, Chairperson

Attachments: Appendix A: Procedural History and Project Activities
Appendix B: Species at Risk in Nunavut
Appendix C: Archaeological and Palaeontological Resources Terms and Conditions for Land Use Permit Holders.

## Appendix A
Procedural History and Project Activities

***Procedural History***

On February 20, 2014 the Nunavut Impact Review Board (NIRB or Board) received an application from the Nunavut Research Institute (NRI) for an amendment to the University of Ottawa - Luke Copland's NRI Scientific Research License (NRI File No.: 0200614R-M) for the "Northern Ellesmere Ice Shelves" project proposal. On March 28, 2014 the NIRB received a positive conformity determination (North Baffin Regional Land Use Plan) from the Nunavut Planning Commission (NPC) for this file.

*Past File History*

On February 5, 2008 the NIRB received the original project proposal (NIRB File No.: 08YN010) from the NRI and a positive conformity determination (North Baffin Regional Land Use Plan) from the NPC. The proposal was screened by the Board in accordance with Part 4, Article 12 of the Nunavut Land Claims Agreement (NLCA). On March 26, 2008 the NIRB issued a NLCA 12.4.4(a) screening decision to the Minister of Education, Government of Nunavut which indicated that the proposed project could proceed subject to the NIRB's recommended project-specific terms and conditions.

On December 12, 2008 the NIRB received an amendment application from the NRI which was screened by the Board in accordance with Part 4, Article 12 of the NLCA. On January 27, 2009 the NIRB issued a revised NLCA 12.4.4(a) screening decision to the Minister of Education, Government of Nunavut which indicated that the proposed project could proceed subject to the terms and conditions as originally issued by the NIRB in its Screening Decision Report on March 26, 2008 and *additional* recommended project-specific terms and conditions.

On March 8, 2012 the NIRB received an application from the NRI to extend Luke Copland's Scientific Research License (NRI File No.: 0200609N-M) for an additional year to continue ongoing research activities. After a thorough assessment of the application the NIRB determined that the proposal was exempt from screening pursuant to Section 12.4.3 of the NLCA and reissued the January 27, 2009 Screening Decision Report.

*Current File History*

The current project proposal by the University of Ottawa - Luke Copland is for an amendment to the existing NRI Scientific Research License (NRI File No.: 0200614R-M).

The NIRB determined that this request may result in a change to the scope of the project and on April 7, 2014 distributed the current project proposal to community organizations in Grise Fiord and Resolute Bay, as well as to relevant federal and territorial government agencies, and Inuit organizations. The NIRB requested that interested parties review the proposal and the NIRB's previously recommended terms and conditions and provide the Board with any comments or concerns by April 17, 2014 regarding:

- Whether the inclusion of the additionally proposed component(s) and/or activity(ies) would significantly modify the project;

- Any additional mitigation measures that are appropriate; and
- Any other matter of importance to the Party related to the project proposal.

On or before April 22, 2014 the NIRB received comments from the following interested party:

- **Environment Canada**
- **Government of Nunavut – Department of Environment**

All comments provided to NIRB regarding this project proposal can be obtained from the NIRB's online public registry at the following location:

http://ftp.nirb.ca/01-SCREENINGS/COMPLETED%20SCREENINGS/2008/08YN010-Luke%20Copland/02-DISTRIBUTION/COMMENTS/

***Project Activities***

This project is located within the Qikiqtani region, approximately 600 to 710 kilometres (km) from Grise Fiord and approximately 800 to 1000 km from Resolute Bay. The Proponent intends to survey landfast sea ice and ice shelves of Ellesmere Island.

The original application screened in accordance with Part 4, Article 12 of the NLCA, included the following project components and activities:

- Temporary camping;
- Use of aircraft for transport of project personnel;
- Use of on-site mechanized vehicles;
- Sewage or grey water storage and disposal;
- Solid waste disposal;
- Chemical storage;
- Hydrological testing;
- Ecological surveying; and
- Ice thickness radar surveys and shallow ice coring.

The project activities associated with the previous December 12, 2008 amendment application included the following additional components:

- 4 project personnel on site for 20 days each year;
- Temporary field camps (tents) established each year;
- Use and storage of fuel (410 litres [L] of gasoline, 1230 L of aviation fuel and 160 L of propane) with fuel to be cached for use in subsequent years; and
- Permanent installation of scientific equipment (weather station and GPS).

The March 8, 2012 application requested to extend the NRI Scientific Research License and continue research for an additional six years.

The Proponent is currently applying for an amendment to their NRI Scientific Research License which includes the following additional components or activities:

- Include data collection on White Glacier and Axel Heiberg Island; and
- Conduct low-level flights approximately once every 2 or 3 years to capture the air photo record of the glaciers.

The proposed activities are to occur annually from April to July, and while the Proponent has expressed the intent for the project to continue up to 25 years, the research license would be required to be renewed annually. As such the NIRB would expect to see additional applications for extensions or amendments related to this project.

## Appendix B
Species at Risk in Nunavut

This list includes species listed on one of the Schedules of SARA (*Species at Risk Act*) and under consideration for listing on Schedule 1 of SARA. These species have been designated as at risk by COSEWIC (Committee on the Status of Endangered Wildlife in Canada). This list may not include all species identified as at risk by the Territorial Government.

- 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.

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: July 2013

| **Species at Risk** [1] | **COSEWIC Designation** | **Schedule of SARA** | **Government Organization with Primary Management Responsibility** [2] |
|---|---|---|---|
| Peary Caribou | Endangered | Schedule 1 | Government of Nunavut (GN) |
| Barren-ground Caribou (Dolphin and Union population) | Special Concern | Schedule 1 | GN |
| Polar Bear | Special Concern | Schedule 1 | GN |
| Short-eared Owl | Special Concern | Schedule 1 | GN |
| Peregrine Falcon | Special Concern (*anatum-tundrius* complex[3]) | Schedule 1 | GN |
| Rusty Blackbird | Special Concern | Schedule 1 | GN |
| Felt-leaf Willow | Special Concern | Schedule 1 | GN |
| Porsild's Bryum | Threatened | Schedule 1 | GN |
| Eskimo Curlew | Endangered | Schedule 1 | Environment Canada (EC) |
| Ivory Gull | Endangered | Schedule 1 | EC |
| Red Knot (*rufa* subspecies) | Endangered | Schedule 1 | EC |
| Ross's Gull | Threatened | Schedule 1 | EC |
| Red Knot | Special Concern | Schedule 1 | EC |

| **Species at Risk** [1] | **COSEWIC Designation** | **Schedule of SARA** | **Government Organization with Primary Management Responsibility** [2] |
|---|---|---|---|
| (*islandica* subspecies) | | | |
| Harlequin Duck (Eastern population) | Special Concern | Schedule 1 | EC |
| Grizzly Bear | Special Concern | Pending | GN |
| Wolverine (Western population) | Special Concern | Pending | GN |
| Horned Grebe (Western population) | Special Concern | Pending | EC |
| Buff-breasted Sandpiper | Special Concern | Pending | EC |
| Atlantic Cod, Arctic Lakes | Special Concern | No schedule | Fisheries and Oceans Canada (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 |
| Killer Whale (Northwest Atlantic / Eastern Arctic populations) | Special Concern | Pending | DFO |
| Narwhal | Special Concern | Pending | DFO |

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

[2] Environment Canada (EC) 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* 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, and was added to Schedule 1 of SARA in July 2012.

**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 Aboriginal Affairs and Northern Development 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.

[1] 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 Aboriginal Affairs and Northern Development 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 *Nunavut Land Claims 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 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 Nunavut Land Claims 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.*

[2] s. 51(1)
[3] P.C. 2001-1111 14 June, 2001

(**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, Language, Elders and Youth (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 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 Nunavut Land Claims Agreement), and the Aboriginal Affairs and Northern Development 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.