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Appendix

GN-01: Archaeological Resources	
Department	Culture and Heritage
Organization	Government of Nunavut
Subject/Topic	Archaeological Resources
References	NIRB Notice of Screening
CONCERNS	
<p>The proponent proposes to develop, operate and maintain a 15 km all-weather community access road with a bridge and multiple culverts following an existing all-terrain vehicle trail near the Hamlet of Naujaat (Repulse Bay). Project activities will also include: use of eight (8) borrow sites and other gravel quarries along the road alignment; construction and use of any access roads as required; potential for blasting of bedrock exposures to make riprap and rock fills; and construction of a clear span bridge.</p> <p>A search of the Nunavut Archaeological Site Database indicates that numerous sites are located along the proposed trail route. This however does not preclude the presence of additional unidentified sites or cultural features.</p> <p>CH also notes that the applicant will be mobilizing vehicles and equipment along the trail route and access roads. This constitutes a concern as the likelihood of vehicles impacting unidentified (unrecognized) protruding cultural features is high (i.e. inuksuit, caches, look-out, dwelling, etc.).</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<p>The Department of Culture and Heritage recommends that:</p> <ol style="list-style-type: none"> 1) The proponent hires a qualified archaeologist in order to conduct a systematic site inventory and an archaeological assessment prior to any ground disturbance activities (including: the 15 km access road; additional access roads; borrow sites and quarries; blasting areas; clear span bridge; and culverts). 2) No activities be conducted in the vicinity (50 m buffer zone) of any archaeological sites. If archaeological sites or features are encountered during the project, activities should immediately be interrupted and moved away from this location. Each site encountered needs to be recorded and reported to the Department of Culture and Heritage. <p>All archaeological and palaeontological sites in Nunavut are protected by law. The applicant must understand that it is their responsibility to ensure that no heritage resource sites are disturbed in the course of their activities. No person shall alter, or otherwise disturb an</p>	

archaeological site, or remove any artifact from an archaeological site. Moreover, the building of inuksuit is not recommended.

GN-02: Road Development In Caribou Calving Grounds	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Road Development in Caribou Calving Grounds
References	<ul style="list-style-type: none"> • NIRB Application for Screening #125448 – Community Access Trail – Hamlet of Naujaat • NIRB Public Notice of Screening and Comment Request for Hamlet of Naujaat’s “Community Access Trail Project” Project Proposal • Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat • North Arrow Minerals inc. (2019). Map of North Arrow Minerals Naujaat Project • Proponent Response to March 4, 2019 Information Request
CONCERNS	
<p>The Project is located in the southern portion of the Wager Bay Barren-ground caribou herd’s calving ground. Caribou seek out specific calving areas to avoid disturbance and predatory pressure. Development of an all-season road within a calving ground introduces both of these effects to that area. This can result in range shifts or abandonment, as caribou seek other, disturbance free areas.</p> <p>The Project application contains insufficient information, which impedes the GN’s accurate assessment and review of the Projects potential environmental effects. The Project may potentially cause significant adverse impacts on wildlife if the appropriate mitigation is not identified and implemented.</p> <p>The Proponent proposes construction and operation of a 14.76 km long, 6 m wide all-season road with a crowned gravel surface and 50 km/h speed limit. The objective of the Project is to ensure:</p> <p>“...safer access by community members to caribou hunting grounds; access to potential sand, gravel, and carving stone resources; the development of eco-tourism and educational opportunities; and the facilitation of industrial opportunities (e.g., North Arrow Minerals’ exploration activities of the Q1-4 kimberlite deposit).” (Environmental and Design Considerations, 2018)</p> <p>The road appears to partially cross the Wager-Bay caribou herd calving area.</p> <p>There may be an indirect adverse effect of this road on caribou abundance caused by increased access to calving grounds, key access corridors, and migratory habitat likely resulting in increased hunting during sensitive times of year, and tourism development, unless there is a proven effective mitigation in place to address the increased harvesting pressure.</p>	

Potential use of this road to facilitate exploration activities and other industrial opportunities may contribute to adverse cumulative effects on wildlife in the area over the long term.

The Project proposal does not reflect potential impacts of the road on Wager-Bay caribou herd calving and post-calving areas, key access corridors, and migratory corridors and does not provide for an assessment of cumulative effects on wildlife.

SUGGESTIONS AND RECOMMENDATIONS

The GN suggests that missing information is necessary for the Board to conduct its screening. Accordingly, the GN asks that the NIRB exercise its power pursuant to *NuPPAA s. 144(1)*, and direct the Proponent to provide the information described below:

1. The Project application should provide for an assessment of impacts including indirect adverse effect of this road on caribou abundance caused by increased access to hunting grounds and tourism development during sensitive times of the year to caribou.
2. The Proponent should revise the Environmental and Design Considerations to include a detailed description of the proposed and proven mitigation measures and a monitoring program proven effective to ensure proposed mitigation is followed.

The GN further recommends that the Proponent co-ordinate the development of the environmental information with the GN regional biologist and local wildlife conservation officers in dealing with their proposed mitigation measures and response measures.

If the all-season road is approved to be constructed, the Proponent should develop a roads management plan to identify, monitor, and mitigate impacts related to road construction and use. The roads management plan should include developing mitigation strategies and collecting data for:

- Traffic volume (quantity), type, speed, and seasonality;
- Dust emissions and appropriate triggers for mitigation (e.g. speed limits, dust suppressants);
- Changes in vegetation health, abundance, and species assemblages;
- Noise;
- Permeability to wildlife (see GN-02).

A roads management plan would include steps taken to identify, monitor, and mitigate impacts and provide organizations and individuals in constructing, using, and maintaining the road with the knowledge and tools to reduce or eliminate the impacts of road development on wildlife, which are clearly valued by the community.

GN-03: Wildlife Impact Management	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Wildlife Impact Management
References	<ul style="list-style-type: none"> • Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat • NIRB Public Notice of Screening and Comment Request for Hamlet of Naujaat’s “Community Access Trail” Project Proposal
CONCERNS	
<p>The adverse impacts to wildlife from road construction and use are not fully addressed or mitigated within the Proponent’s Project proposal. Use of the road as a source of impact to wildlife is not considered. The Proponent states:</p> <p style="padding-left: 40px;">“... the magnitude and duration of [adverse effects on wildlife] are unlikely to be long-lasting or have population-level consequences.” (Environmental and Design Considerations, 2018)</p> <p>The GN does not agree with this assessment, primarily for the three main reasons identified by the Proponent in the Project proposal: mortality, sensory disturbance, and disruption of movement.</p> <ul style="list-style-type: none"> • Mortality: This includes both direct mortality on the road and the indirect mortality associated with increased hunting pressure, and though both are not likely to be substantial during the construction phase of the Project, they are expected to be throughout the life (use phase) of the road. • Sensory Disturbance: Wildlife may avoid roads and the human activity roads support. The Proponent describes the Project as a community access trail but includes mixed industrial use (quarries, mining development) as a stated intent for developing the Project. These uses serve to magnify the intensity of disturbance and it can be expected that any avoidance response by wildlife would also be magnified. Sensory disturbance is an issue for both the construction and use of the road. • Disruption of Movement: As with sensory disturbance, this effect can be linked to a variety of factors, including traffic type and volume. Based on the Proponent’s stated interests for the road, the type and volume of traffic on the road is expected to increase over its life and continued use. <p>Construction and use of the road should be expected to have potentially adverse effects on wildlife, and the Project proposal does not include a plan to identify, monitor, reduce or eliminate these effects.</p>	
SUGGESTIONS AND RECOMMENDATIONS	

The GN recommends that the Proponent develop a wildlife monitoring and mitigation plan (WMMP) to identify and evaluate adverse effects from the Project on wildlife. This plan should include elements such as proven methods and analysis approach for wildlife monitoring, assessment of infrastructure permeability for wildlife, changes in hunting pressure, occurrence and distribution of wildlife, etc. also, the Role of Environmental Monitors (see GN-09).

GN-04: Potential Effects of Helicopters on Wildlife	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Potential Effects of Helicopters on Wildlife
References	<ul style="list-style-type: none"> • NIRB Application for Screening #125448 – Community Access Trail – Hamlet of Naujaat • Government of Nunavut (2003). Nunavut Wildlife Act
CONCERNS	
<p>The use of helicopters is suggested as necessary for initial environmental surveys, engineering, etc. (NIRB Application for Screening #125448). Use of helicopters can have negative impacts on wildlife, especially during critical stages of their lifecycle (e.g. calving).</p> <p>The Nunavut <i>Wildlife Act</i> prohibits harassment of wildlife, as an individual (s.74.1) and through the use of a vehicle or other conveyance (s.87.1.d)</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<ol style="list-style-type: none"> 1. Ensure that wildlife will not be harassed or disturbed. 2. Cease Project activities when caribou and other terrestrial wildlife are observed to be approaching the Project area. 3. Maintain a minimum aircraft flight altitude of 610m above ground level and 600m horizontal distance from wildlife habitat. 	

GN-05: Potential Quarry and Borrow Sites	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Potential Quarry and Borrow Sites
References	<ul style="list-style-type: none"> • Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat • NIRB Public Notice of Screening and Comment Request for Hamlet of Naujaat’s “Community Access Trail” Project Proposal
CONCERNS	
<p>A stated purpose for this road development is to access granular materials, via quarry and/or borrow sources (at least 8 identified so far) (Environmental and Design Considerations, 2018).</p> <p>The GN is concerned that there is no information related to the location, number, development, use/exploitation, and closure/reclamation of these sites. Furthermore, no description of the adverse effects related to quarry use or the monitoring and mitigation of these effects on local wildlife, is included in the Project’s application materials.</p> <p>It appears that the application is deficient in this area. If blasting or development of access roads are required to access these quarry/borrow sites, the adverse effects of these activities are similarly lacking from the application (see GN-06 and GN-07).</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<p>The GN recommends that development of quarry/borrow management plans should be developed for each site if new quarry and borrow sources are developed and utilized for any portion of the construction or use of the proposed all-season road.</p> <p>Quarry/borrow management plans should include elements such as:</p> <ul style="list-style-type: none"> • Location and description of each site; • Geotechnical assessment to evaluate the stability of the site and acid generating potential; • Type of materials present and approximate volumes to be removed; • Permafrost assessment to reduce permafrost degradation, erosion (via melting permafrost); • Water management (drainage, dewatering, freshet, alteration of water courses, etc.); • Soil/sediment erosion prevention and control; • Public safety access restrictions; • Monitoring for wildlife use/impact (carnivore denning [sand/gravel] and raptor nesting [quarry] prior to or during quarry/borrow development); • Ancillary activities required for each site (blasting, access roads); 	

- Reclamation and closure plans.

GN-06: Additional Access Roads	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Additional Access Roads
References	<ul style="list-style-type: none"> • Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat • NIRB Public Notice of Screening and Comment Request for Hamlet of Naujaat’s “Community Access Trail” Project Proposal
CONCERNS	
<p>Additional road access may be required to reach quarry or borrow sources. The location, length, and construction requirements (e.g. water crossings) of these access roads are not described in the Proponent’s application.</p> <p>A stated purpose of the all-season road is to concentrate local traffic, preventing trail braiding and degradation of adjacent terrestrial and aquatic habitat (Environmental and Design Considerations, 2018). The GN is concerned, however, that the established road will provide more efficient access to areas which were previously more difficult to get to and serve to enable more side trails and junctions into undisturbed areas.</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<p>The GN recommends that the Proponent:</p> <ul style="list-style-type: none"> • Identify potential access roads that will connect to the main road as proposed. Additional details are required; • Establish guidelines for local use of the road and work with local user groups to reduce the impact and damage resulting from side-trails, offshoots, and other branching trails. This could include identification of side trails. 	

GN-07: Potential Blasting Activity	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Potential Blasting Activity
References	<ul style="list-style-type: none"> • Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat • NIRB Public Notice of Screening and Comment Request for Hamlet of Naujaat’s “Community Access Trail” Project Proposal
CONCERNS	
<p>Blasting can have a negative effect on wildlife and wildlife habitat through vibration, noise, dust, toxic fumes, pollution from explosives and residues, and habitat loss and alteration.</p> <p>The Project proposal did not include information on blasting and only stated that should blasting be necessary, the Hamlet of Naujaat will work with its contractors and regulators to develop wildlife management plans specific to blasting (Environmental and Design Considerations, 2018). The GN views this approach as inadequate; blasting should either form a part of this application or not.</p> <p>Blasting management plans containing a wildlife impact monitoring and mitigation component should be developed for any blasting associated with the Project. This includes blasting to create or improve the road right of way itself, access roads, or any blasting required to source road construction materials.</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<p>The GN recommends that the Proponent identify the location and intensity of any Project-related blasting activity, and provide blasting management plans, including impact monitoring and mitigation plans to reduce or eliminate adverse effects on wildlife.</p> <p>Any future blasting activity should be described and reviewed under separate application to the NIRB.</p>	

GN-08: Potential Invasive species And Erosion Prevention	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Potential Invasive species and Erosion Prevention
References	<ul style="list-style-type: none"> • Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat • NIRB Public Notice of Screening and Comment Request for Hamlet of Naujaat’s “Community Access Trail” Project Proposal • Government of Nunavut (2003). Nunavut Wildlife Act
CONCERNS	
<p>Controls identified by the Proponent for preventing the introduction of invasive species and erosion prevention may be inadequate. The <i>Nunavut Wildlife Act</i> states:</p> <p style="padding-left: 40px;">“No person shall release a member of a species into a habitat in which that species does not belong or never naturally occurred.” (Government of Nunavut, 2003; Section 91.2)</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<p>The GN recommends the following mitigation regarding invasive species prevention:</p> <ul style="list-style-type: none"> • <u>Earthmoving equipment</u>: All equipment not already located in the community should be thoroughly cleaned of dirt and debris and inspected prior to deployment to prevent introduction of invasive plant species (including and especially as seeds). • <u>Erosion Prevention</u>: The Proponent identifies a number of ways to reduce possible erosion which may not be appropriate for application at the Project area. <ul style="list-style-type: none"> ○ Mulches (typically wood): Could potentially introduce atypical plant material to the Project area and may contain invasive species. ○ Top-soil reapplication and seeding: Seed mixes that are Arctic-specific and match the species assemblages found in the Project area may not be commercially available, and non-native species should not be introduced. ○ Hydro-seeding: Seed mixes that are Arctic-specific and match the species assemblages found in the Project area may not be commercially available, and non-native species should not be introduced. <p>The GN recommends that the Proponent avoid utilizing erosion control methods which have the potential to introduce invasive species. Stockpiled topsoil should be handled in such a way that wind and water erosion does not become a problem.</p>	
ADDITIONAL COMMENTS	

Care should be taken during all stages of the Project (planning, construction, operation, and reclamation) to avoid introduction of invasive species. This effort should include periodic monitoring, via botanical surveys, to identify and control species that have been introduced through Project activities.

GN-09: Environmental Monitors	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Roles and Responsibilities of Environmental Monitors
References	Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat
CONCERNS	
<p>The Project proposal lacks information about the roles and responsibilities of the Environmental Monitors and it appears that their role exists only for construction, not use or ongoing maintenance of the road.</p> <p>The description of training provided to the Environmental Monitors does not explain what they will be learning or what the extent of their role is. The application notes that the Environmental Monitors will collect observation data but does not include information on how these data will be collected, analyzed, reported, used, or distributed.</p> <p>Direct wildlife mortality (vehicle collisions) are to be reported to the Environmental Monitors; These must also be reported to the GN via the Naujaat Conservation Officer.</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<p>The GN recommends that the Proponent provide a description of the roles and responsibilities of the Environmental Monitors and their training plan.</p> <p>The GN recommends that the Proponent develop a wildlife data management plan that describes what data will be collected, proven methods of collection and analysis, and how and to whom the data or findings will be distributed. This should also include how the observations of the monitors will be incorporated into adaptive management to address ongoing impacts from Project activity.</p>	

GN-10: Potential Road Use for Industrial Activities	
Department	Environment
Organization	Government of Nunavut
Subject/Topic	Potential Road Use for Industrial Activities
References	<ul style="list-style-type: none"> • Environmental and Design Considerations (2018) – Community Access Trail – Hamlet of Naujaat • NIRB Public Notice of Screening and Comment Request for Hamlet of Naujaat’s “Community Access Trail” Project Proposal
CONCERNS	
<p>The GN is concerned that the proposed community access trail will become increasingly utilized by industrial activities. Two stated intents for the proposed roads are access to granular and quarry materials for the Hamlet of Naujaat and access to mineral resources and support for bulk sampling by North Arrow Minerals at the Qilalugaq Project.</p> <p>In addition to increased industrial use having the potential to displace or impede local use of the proposed road, the type and volume of traffic associated with these uses may have an increased impact on caribou use of adjacent habitat.</p>	
SUGGESTIONS AND RECOMMENDATIONS	
<p>The GN recommends that:</p> <ul style="list-style-type: none"> • Any proposal by the Hamlet to use the road for access granular or quarried materials outside of municipal boundaries should be described and reviewed under a separate application to the NIRB; • Any proposal by North Arrow to use the road for access to its mineral holdings should be described and reviewed under a separate application to the NIRB. 	