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January 26th, 2024

Jeff Balsdon
Project Manager, Atlantic Region
Impact Assessment Agency of Canada

**Subject: Natural Resources Canada's Review of the Initial Project Description for the New Nain Airport Project.**

Dear Colleague,

On December 18th, 2023, the Impact Assessment Agency of Canada (the Agency) requested that Natural Resources Canada (NRCan) provide input regarding the Initial Project Description (IPD) for the New Nain Airport Project.

NRCan has reviewed the document in relation to its mandate and expertise in the areas of permafrost, groundwater, and natural hazards.

Details of NRCan's response can be found in the completed Federal Authority Advice Record (FAAR) below.

If you have any questions, comments, or concerns, please contact me at sophia.stlawrence@nrcan-rncan.gc.ca

Sincerely,

Sophia St. Lawrence
Impact Assessment Officer
Office of the Chief Scientist
Natural Resources Canada

cc: Peter Unger – Director, Office of the Chief Scientist
Shelley Ball – Team Lead, Office of the Chief Scientist

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**Federal Authority Advice Record (FAAR)**

**The FAAR must be submitted to the Registry by January 26, 2024.**

**New Nain Airport Project – Nunatsiavut Government**
Registry reference no: 87156

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|---|---|
| Department/Agency | Natural Resources Canada (NRCan) |
| Lead contact | Sophia St. Lawrence |
| Full address | 588 Booth Street, Ottawa, ON, K1A 0E4 |
| Email | sophia.stlawrence@nrcan-rncan.gc.ca |
| Telephone | <personal informatino removed> |
| Alternate Contact | Shelley Ball (shelley.ball@nrcan-rncan.gc.ca) |

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1. a) Is it probable that your department or agency may be required to exercise a power or perform a duty or function related to the Project to enable it to proceed?

   If yes, specify the Act of Parliament and that power, duty or function.

   No.

   b) Please describe any Indigenous or public consultation that will be undertaken in relation to the excise of that power, duty or function, including when it would take place.

   N/A

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2. Is your department or agency in possession of specialist or expert information or knowledge in one of your fields of expertise that may be relevant to the conduct of an impact assessment of the Project?

   Specify the specialist or expert information or knowledge.

   NRCan possesses the following expertise that may be relevant to the conduct of an impact assessment for this project:
   - Permafrost
   - Groundwater
   - Natural Hazards.

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3. Has your department or agency exercised a power or performed a duty or function under any Act of Parliament in relation to the Project; or taken any course of action that would allow the Project to proceed in whole or in part?

Please specify if applicable.

NRCan does not have an interest in the Project, nor has it taken any course of action (e.g., regulatory decision, funding, etc.) to enable to the Project to proceed in whole or in part

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4. Has your department or agency had previous contact or involvement with the proponent or other party in relation to the Project (for example: an enquiry about methodology, guidance, or data; introduction to the Project)?

   Please provide an overview of the information or advice exchanged.

   No.

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5. Does your department or agency have additional information or knowledge about the project not specified above, including information about its geographic, environmental, economic or social context (for example, location of protected or sensitive areas, history between local communities and proponent or similar projects, local or regional social or economic concerns)?

   Please specify if applicable.

   No.

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6. From the standpoint of your department's mandate and expertise, what are the main issues concerning the project?

   For each key issue, please:
   - describe the effect or the nature of the issue, including any relevant context;
   - provide the rationale and/or evidence for why it is a key issue;
   - briefly provide solutions to the issue, including information or studies that, if applicable, should be requested to the proponent in the Tailored Impact Statement Guidelines, potential mitigation measures, or regulatory requirements relevant to the issues;
   - provide a concise, plain-language summary of the issue for inclusion in the Summary of Issues.

   The information provided will be taken into consideration by the Agency to formulate an opinion on whether an impact assessment is required and, if applicable, will be taken into account in developing project-specific Tailored Impact Statement Guidelines in the next steps of the impact assessment process.

   Please use Table 1 to answer this question.

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7. If applicable, specify any additional information the proponent could provide in the Detailed Project Description or in its response to the Summary of Issues that:
   - would make it possible to verify whether certain minor issues could be addressed and managed by clear measures, existing guidelines, other regulatory processes or other existing tools;
   - help the Agency to provide an opinion if an impact assessment is required, or
   - would support the tailoring of the Impact Statement Guidelines if the Agency is of the opinion that an impact assessment is required.

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These clarifications and additional information will be included as specific questions/issues in the Summary of Issues provided to the proponent.

Please use Table 2 to answer this question.

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Natural Resources Canada
Name of department or agency

Impact Assessment Officer
Speaker title

January 26th, 2024
Date

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## Table 1: Key issues to inform the impact assessment process

**The Agency asks that federal authorities guide expert advice on the Agency's approach to project specific tailoring, if the Agency is in the opinion that an impact assessment is required. This approach aims to focus the assessment on the Project's key issues, with an emphasis on the prevention of adverse environmental effects in areas of federal jurisdiction. In determining key issues, federal authorities should be mindful of the Project's context (size, scope, location), Indigenous knowledge and perspectives, and public concerns.**

**Potential effects that are considered minor, or that can be mitigated through clear measures, existing guidance or other regulatory processes, may be subject to simplified information requests or be disregarded. Advice from federal authorities on key issues and solutions - and on the scope and detail of the studies and information requested - will enable the Agency to focus the analysis on those issues that are important for the impact assessment process.**

| Comment ID | Relevant section of the initial project description | Valued Component or Factor to Consider | Description of key issue (context and rationale) | Advice | Plain-language summary for inclusion in Summary of Issues |
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| ***Please present comments by organization and comment number***<br><br>***e.g.: IAAC-01*** | ***If the comment relates to a specific section of the initial project description, please provide the reference.*** | ***Identify valued component(s) or factors to consider—within the mandate of your department or agency—to which the potential effect or issue applies.*** | ***Please provide a brief description of the issue and rationale for being a key issue.***<br><br>***Include, where relevant:***<br>• ***the sequence of potential effects;***<br>• ***the relevant context that specifies why this is a key issue;***<br>• ***key uncertainties that should be addressed in the impact assessment;***<br>• ***Indigenous or public concerns or perspectives;***<br>• ***scientific data or traditional knowledge, including from previous projects, that justifies the inclusion of the key issue in the project assessment.*** | ***If applicable, please provide brief solutions/advice to address the issue or potential effect, including:***<br>• ***studies or information relevant to describing and characterizing the potential effect, including any guidance for data collection or analysis or existing data sources to inform the assessment;***<br>• ***any powers your department or agency has that may mitigate, manage or set conditions related to the issue;***<br>• ***advice or policies to frame and mitigate the potential effect;***<br>• ***standardized mitigation or monitoring measures that could manage potential effects, including follow-up on monitoring activities;***<br>• ***commitments the proponent could make to respond to the issue.*** | ***For issues to be included in the Summary of Issues, provide a concise, plain language synopsis of the key issue and any questions or directions for the proponent, if applicable.*** |
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| NRCan - 01 | IPD (December 4, 2023) Section 4.3, Section 6.1.3 | Groundwater | Groundwater quantity may be impacted through use of groundwater for potable water supply and dewatering for construction. | NRCan looks forward to reviewing the information on baseline groundwater in the document R4 to help understand the impacts on groundwater following the project activities. If possible, NRCan would also like to see the data collected, results of the sampling, and any additional information on the field work undertaken and the results in the next stage of the | Groundwater use for potable water supply and construction activities may impact other groundwater users, and/or aquatic habitat. |

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| | | | NRCan understands that the proponent will undertake a desktop analysis to understand the groundwater conditions at the site. Information on groundwater will be provided in a document R4 – surficial geology, geomorphology, permafrost and hydrogeological investigations. It will include the hydrogeological information/conditions, dewatering impacts, domestic, communal or municipal water wells, sources of potable groundwater, groundwater characterization, faults and fractures, groundwater flow, groundwater divides, permafrost impacts on groundwater movement, and relevant groundwater data from additional geotechnical assessments. A 3D groundwater numerical model based on this information will be included in R4 to assess the potable well (s) capture zones for a potable water supply. | EA process e.g., DPD (detailed project description). Where groundwater may interact with surface water (e.g., at Kauk Brook and Blow Hole Creek (IPD Section 4.3)) NRCan would like to see information on groundwater-surface water interactions and expected impacts.<br><br>As a 3 D numerical model (section 6.1.3 – IPD 2023) analysis will also be undertaken by the proponent to assess the impacts during the project activities including the potable water wells. NRCan looks forward to reviewing the results of the model. NRCan would also like to see whether any wetlands or fish habitat is within the model forecasted capture zone of the potable water supply. | Groundwater characterization, and quantitative modelling will assess the expected impacts. |
| NRCan-02 | IPD (December 4, 2023) Section 4.2, Section 6.1.4 | Natural hazards | The proponent has indicated in the IPD that the R4 report on surficial geology, geomorphology, permafrost and hydrogeology investigations are complete, and will be available later for review. This document should cover the natural hazards (seismic, landslides etc.) in the region and include identification and mapping of natural hazards, site constraints and issues related to geotechnical and hydrogeological | NRCan looks forward to reviewing the R4 report that contains information on landslides and accompanying detailed maps (1:15,000 scale) as well as regional maps (1:50-100,000 scale) for each of these components. The maps should inform the distribution of specific units that are prone to landslides at a local scale and also help inform the overall geological/geomorphological context of the region. In addition to this, the bedrock geology investigation and accompanying maps are also valuable in assessing the landslide potential, given the varied terrain elevations. | The project activities could potentially impact the stability of slopes and cause landslides.<br><br>A terrain stability assessment will help understand the landslide hazard.<br>It is expected that seismicity would also be addressed in R4. |

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| | | | conditions, surficial geology, geomorphology and permafrost. | In addition to these investigations and given that the terrain is very steep in some areas, it is suggested that a terrain stability assessment be included, following the method of the British Columbia Ministry of Forests, 1999: Mapping and assessing terrain stability guidebook, 2nd ed., Forest Practices Code of British Columbia, Victoria, BC.<br><br>This assessment helps display the stability of the terrain divided in five categories, from stable (I) to highly unstable (V), for all types of landslides.<br><br>A link for the BC website is provided for the proponent:<br><br>https://www.for.gov.bc.ca/hfd/library/ffip/BCMoF1999_C.pdf | |
| NRCan-03 | IPD (December 4, 2023) Section 2, (Figure 2.1), Section 4.2 | Permafrost | The Proponent has provided a map showing potential permafrost areas. It is understood that details of these areas will be presented in the R4 document which covers surficial geology, geomorphology, permafrost, and hydrogeological investigations. The proponent has indicated that this document will include field investigations on identification of permafrost continuous/discontinuous areas and ground ice areas. Nain is surrounded by discontinuous scattered permafrost, with recognition that detecting permafrost bodies around Nain is challenging (e.g., Way and Lewkowicz, 2015). In discontinuous permafrost areas, distinction between seasonal frost and permafrost areas is key to design and management | NRCan looks forward to reviewing the information on the potential permafrost areas in the document R4, including how the potential permafrost areas were mapped. NRCan would like to see the methodologies used to identify and delineate these potential permafrost areas, the field data collected (or planned) to validate these areas as well as to confirm the non-permafrost areas (including the distinction between seasonal frost and permafrost areas). For permafrost areas, NRCan would like to see the field data collected (or planned) to assess the ground ice areas, i.e., the ice-rich ground, including its excess ice content.<br><br>A discussion on the detection (and field investigation used) of permafrost bodies for the region of Nain is presented in:<br><br>Way G.R and Lewkowicz, A.G. 2015. Investigations of discontinuous permafrost in coastal Labrador with DC electrical resistivity tomography. In Proceedings of GeoQuebec 2015. DOI: 10.13140/RG.2.1.1647.8803 | In discontinuous permafrost areas, distinction between seasonal frost and permafrost areas is key to design and management considerations.<br><br>NRCan suggests including a documented map of potential (or known) permafrost areas, which will help assess where permafrost bodies could impact the Project activities. Areas of ice-rich permafrost should also be |

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| | | | considerations. Permafrost areas, especially ice-rich ground, being affected by thaw settlement, formation of thermokarsts, and slope instability. Results of the field investigations should make it possible to distinguish between seasonal frost vs permafrost areas. Field investigations also need to account for ground ice content (excess ice) measurements. | Field investigations standards in permafrost regions can be found in:<br><br>Geotechnical Site Investigation for Building Foundations in Permafrost Zones, Standard CAN/BNQ 2501-500 https://www.bnq.qc.ca/en/standardization/civil-engineering-and-urban-infrastructure/geotechnical-site-investigation-for-building-foundations-in-permafrost-zones.html<br><br>Guidelines for development and management of transportation infrastructure in permafrost regions<br><br>https://www.tac-atc.ca/en/publications/ptm-permafrost | considered in the mapping.<br><br>It is expected that all this information on permafrost areas would be addressed in R4. |
| NRCan-04 | IPD (December 4, 2023) Section 4.2 | Permafrost | The Proponent has identified frost penetration depth and potential issues related to climate change in field investigations recommendations. However, there is no mention about active layer and permafrost thicknesses. These characteristics are critical parameters in discontinuous permafrost to assess the climate change impacts on infrastructure and underlying permafrost conditions. | NRCan would like to see information on active layer and permafrost thicknesses with associated field data. | Baseline permafrost characteristics (active layer and permafrost thicknesses) are essential to assess the climate change impacts on infrastructure and future permafrost conditions.<br><br>It is expected that this information on permafrost characteristics would be addressed in R4. |
| NRCan-05 | IPD (December 4, 2023) Section 4.1.1, Section 4.2, Appendix B: Section 2.10 | Permafrost | The Proponent identifies permafrost as a climate parameter and presents different projected change for permafrost. NRCan understands that the climate change resilience analysis will be completed in | NRCan looks forward to reviewing the information on the climate change resilience analysis and how permafrost will be taken into consideration. NRCan would like to see how the permafrost projected changes were obtained or any intention to perform thermal analysis to assess the impact that | Ground thermal regime is essential to assess the climate change impacts on infrastructure and |

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| | | | accordance with a CSA document (Technical Guide: Infrastructure in permafrost: A guideline for climate change adaptation (CSA, 2019)). However, there is no mention of ground temperature observations, methodology used for the permafrost projected change, nor clear indication if thermal analysis will be performed. In discontinuous permafrost, small changes in ground temperature can lead to important changes in its properties, behaviour, and characteristics (ex. change in active layer and permafrost thickness) which will impact the performance of infrastructure. Infrastructure can also modify the ground thermal regime and lead to less stable ground. | infrastructure might have on permafrost (including climate change impacts) and to eventually support engineering design. Projected changes for permafrost and thermal analysis require ground temperature data. Therefore, NRCan requests information on the ground thermal regime with associated field data. | future permafrost conditions.<br><br>It is expected that this information on ground thermal regime and projected change for permafrost would be addressed in R4. |
| NRCan-06 | IPD (December 4, 2023) Section 6.1.4 | Permafrost | The Proponent identifies disturbance of sensitive permafrost soils as potential interaction between soils/terrain and the Project. The proposed mitigation measure involves selecting locations and routing for Project infrastructure to avoid potential permafrost areas. No other mitigations measures are considered for potential interaction between permafrost and the Project. | In cases where it would not be possible to avoid permafrost areas, NRCan would like to see proposed alternative mitigation measures and techniques for embankment and pavement approaches over permafrost.<br><br>Mitigation measures in permafrost regions can be found in:<br><br>Guidelines for development and management of transportation infrastructure in permafrost regions<br><br>https://www.tac-atc.ca/en/publications/ptm-permafrost | It may not always be possible to avoid permafrost areas.<br><br>It is expected that further assessment of the interactions of Project activities with the surrounding environment would include mitigation measures for infrastructure on permafrost. |

*Please insert additional lines if necessary*

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**Table 2. Details or additional information the proponent could include in the Detailed Project Description or in the response to Summary of Issues**

| Comment ID | Relevant section of the Initial Project Description | Description of the Issue, Concern or Uncertainty | Clarifications or additional information | Plain-language summary for inclusion in Summary of Issues |
|---|---|---|---|---|
| ***Please identify comments by organization and comment number.***<br><br>***e.g. AEIC-01*** | ***If the comment is related to a specific section of the Initial Project Description, please provide a reference.***<br><br>***You may also choose to copy the relevant text here.*** | ***Provide a description of the issue, concern or uncertainty that the proponent could include in its Detailed Project Description, which could be framed and managed by clear measures, existing guidelines, regulatory processes or other existing tools, and thus be the subject of a simplified information request in the guidelines, or simply be disregarded.*** | ***Specify what additional information the proponent could provide in the Detailed Project Description to address the issue, concern or uncertainty, for example:***<br>• ***clarifications to elements of Project Description (e.g. components, activities, locations or alternatives);***<br>• ***proposals on Project design changes that could avoid effects;***<br>• ***evidence that could demonstrate that the effects will be negligible;***<br>• ***evidence that standard mitigation measures will reduce or eliminate potential effects;***<br>• ***commitments the proponent could make to respond to the question/issue, including the implementation of federal operational policies or guidance documents.*** | ***For issues to be included in the Summary of Issues, provide a concise, plain-language synopsis of the issue and any questions or instructions for the proponent, if applicable.*** |
| NRCan-01 | IPD (December 4, 2023) Section 4.1.1 Climate Change | As groundwater supply will be required for potable water supply, the proponent may want to consider changes in groundwater conditions related to changes in climate variables. NRCan has provided a link below for the proponent to access state-of-the-art regional climate change modelling through the Canada1Water Project which will include mid- and end of century forecasts of air and ground (permafrost) temperatures, and groundwater. Results are expected to be available by end of 2024. | The proponent has the option to enhance the groundwater assessment by incorporating a detailed discussion on the potential impacts of climate change projections, as outlined in Table 4.3, on groundwater availability. Utilizing data accessible through Canada1Water can further substantiate this discussion | Limited information is currently available on the impact of climate change on groundwater resources. Existing and upcoming information may be used to infer potential effects of |

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| | | Link for Canada1Water: https://www.canada1water.ca/ | | climate change on groundwater. |
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***Please insert additional lines if necessary***