



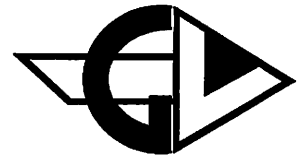
**LINEAR INFRASTRUCTURE CORRIDOR  
KIVALLIQ REGION, NUNAVUT**

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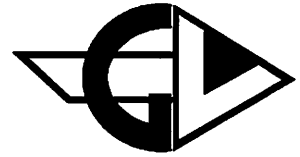
## **EXECUTIVE SUMMARY**

Detailed desktop scoping studies (Manitoba Hydro, 1999; Nishi-Khon / SNC Lavalin, 2007; Nishi-Khon / SNC Lavalin, 2010; Energy Options Working Group (EOWG), 2015) have been commissioned by the Kivalliq Inuit Association (KivIA), in partnership with the Hudson Bay Regional Roundtable and the Canada-Manitoba Economic Development Partnership Agreement. These various studies evaluated the viability of constructing the NMLIC from northern Manitoba to Rankin Inlet, Nunavut. This corridor would include an all-season road and a power transmission line, with the possibility of adding fiber optic and telecommunication service lines. The goal of these studies was to determine the best location and potential benefits for the LIC. The EOWG, 2015 report outlined the following benefits for the five Kivalliq communities identified in the report – Arviat, Baker Lake, Chesterfield Inlet, Rankin Inlet and Whale Cove – and any industry clients to include:

- 1) Projected savings to the communities of \$40M annually in diesel energy
- 2) Projected savings of between \$60-\$100M annually for the mining sector in diesel energy
- 3) An estimated reduction of up to 380 thousand metric tons of GHG emissions
- 4) Creation of important infrastructure and a means for high-speed fibre optic communications; and
- 5) A reduction in the dependence on diesel fuel that would ensure energy prices do not fluctuate with the cost of oil and enable fuel subsidy payments to be reallocated to other important priorities such as health, education and housing.

The KivIA, NTI and the Governments of Canada, Nunavut and Manitoba sponsored the above studies because they saw implementation of the proposed NMLIC as a means of supporting the objectives of healthy communities, unity and self-reliance. This is also in keeping with the broad planning goals set out by NPC in the 2016 DNLUP. The NMLIC would enhance opportunities for resource development such as mining and tourism; benefit employment, small business development and standard of living; and reduce the cost of transporting people and goods between the Kivalliq Region and urban centres in Manitoba.

The scoping scale technical reports have demonstrated that sufficient and robust information exists to permit inclusion of a defined land use designation for the NMLIC into Schedule A and Table 1 of the 2016 DNLUP. There are several cases of inconsistent and contradictory information in the 2016 DNLUP, which does not allow any LIC to conform. This is a significant barrier to advancing the NMLIC, or any LIC, now or in the future. It is recommended that the NPC eliminate these inconsistencies in order that the NMLIC will conform to the DNLUP. Exclusion of the NMLIC from the 2016 DNLUP will have significant negative impacts on the future of economic development in the Kivalliq Region, Nunavut and Canada.



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## **1.0 Introduction**

GeoVector Management Inc. (GeoVector) has completed a review of the existing technical reports on the Nunavut to Manitoba Linear Infrastructure Corridor (NMLIC). This work was completed to assist in determining the viability of the NMLIC's inclusion as a linear infrastructure corridor in the 2016 Draft Nunavut Land Use Plan (DNLUP).

Detailed desktop scoping studies (Manitoba Hydro, 1999; Nishi-Khon / SNC Lavalin, 2007; Nishi-Khon / SNC Lavalin, 2010; Energy Options Working Group (EOWG), 2015) have been commissioned by the Kivalliq Inuit Association (KivIA), in partnership with the Hudson Bay Regional Roundtable and the Canada-Manitoba Economic Development Partnership Agreement. These various studies evaluated the viability of constructing the NMLIC from northern Manitoba to Rankin Inlet, Nunavut. This corridor would include an all-season road and a power transmission line, with the possibility of adding fiber optic and telecommunication service lines. The goal of these studies was to determine the best location and potential benefits for the LIC. The EOWG, 2015 report outlined the following benefits for the five Kivalliq communities identified in the report – Arviat, Baker Lake, Chesterfield Inlet, Rankin Inlet and Whale Cove – and any industry clients to include:

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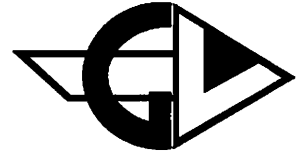
The KivIA and the Governments of Canada, Nunavut and Manitoba see implementation of the proposed NMLIC as a means of supporting the objectives of healthy communities, unity and self-reliance. The proposed road is expected to enhance opportunities for resource development such as mining and tourism; benefit employment, small business development and standard of living; and reduce the cost of transporting people and goods between the Kivalliq Region and urban centres in Manitoba.

## **2.0 Background Information**

### **2.1 Land Use Designation of Linear Infrastructure Corridors (LIC)**

The proposed NMLIC location is illustrated in Schedule B of the 2016 DNLUP, but is not specifically included in the body of the DNLUP. The potential implementation of the NMLIC is limited by:

1. The absence of a separate land use designation in Schedule A, and



2. Conflicting or ambiguous guidance regarding LICs, particularly highways, in the text of the DNLUP.

## **2.2 Protected Area Land Use Designation Impact on LIC**

The development of the NMLIC is not possible with the greatly expanded Protected Area designation, which does not allow for linear infrastructure or any development activities. This will severely hamper economic development in the Kivalliq Region. The existence of the LIC will, on its own, encourage development in its immediate vicinity. Therefore, it is recommended that the NMLIC be incorporated into Schedule A of the DNLUP in the form of a separate Mixed Use and Special Management Area based on the following:

- i) Those portions of the road that coincide with caribou post-calving areas should be incorporated into the DNLUP as Special Management Areas similar to hydro-electric generation opportunities along the Thelon and Quoiich Rivers (2016 DNLUP under Alternative Energy Sources in section 4.3 and in Appendix A, Table 1; sites 80-82).
- ii) The remaining portions of the road should be designated as Mixed Use.

Mitigation of potential impacts resulting from the road would be achieved by relying upon appropriate components of the regulatory process in Nunavut. The primary goal of using either the Special Management or Mixed Use Areas would be to ensure all future work and development along the NMLIC would conform to the final NLUP.

## **2.3 Broad Planning Goals**

The “broad planning goals” developed by the NPC as part of the 2016 DNLUP are based on Article 11 of the NLCA:

***“Goal 1 - Strengthening Partnership and Institutions A Nunavut-Specific Land Use Planning Process***

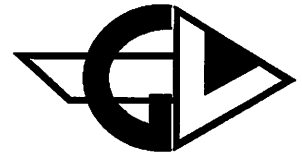
***Goal 2 - Protecting and Sustaining the Environment Protecting Wildlife, Air, Land and Water***

***Goal 3 - Encouraging Conservation Planning***

***Goal 4 - Building Healthier Communities Strengthening Culture, Heritage and Well-being***

***Goal 5 - Encouraging Sustainable Economic Development”.***

The NPC intends these goals “to be read together and interpreted as a whole” along with the planning policies and objectives throughout the NLUP. However, the NPC has not treated all the goals equally nor uniformly throughout the Kivalliq. For example, exploration and development in areas of high mineral potential may encourage economic development as per Goal 5 which would subsequently improve the socioeconomic status of Nunavummiut employees. Socioeconomic improvements have been demonstrated to lead to improvements in the health of individuals and communities through associated health indicators (Chen and Miller 2013) in line with Goal 4.



Employment and investments in local companies may also provide Nunavummiut enough disposable income to make it financially feasible to undertake trips onto the land, thereby strengthening Inuit culture and heritage. However, access to many areas of high mineral potential has been limited by the introduction of many environmentally motivated Protected Areas new to the 2016 DNLUP, pursuant to Goal 2.

A more balanced approach to the five Goals of the NLUP may be to allow most environmental protection and economic development uses to conform with the NLUP by referring project proposals to other regulatory authorities to ensure adequate protection or mitigation is in place, thus providing for project-specific assessment instead of one size fits all blanket assessments.

The proposed road will bring multiple benefits to the Kivalliq in line with Goal 4 and Goal 5, as well as many of the objectives outlined in Chapter 4 “*Building Healthier Communities*” in the 2016 DNLUP. These potential benefits are fully elaborated upon in the technical reports completed on the NMLIC (SNC Lavalin, 2007; Nishi-Khon / SNC Lavalin, 2010; Energy Options Working Group (EOWG), 2015N).

## **2.4 Ambiguous Guidance for LIC**

Despite meeting many of the broad planning goals, the NMLIC would still not conform to the current DNLUP. The Mixed Use land use designation (2016 DNLUP; Section 1.7.5.3; page 22) covers a large portion of Nunavut. Therefore, it would be the primary land use designation for the area encompassing the “*speculative*” NMLIC. The DNLUP states that “*all uses are considered to conform with the Mixed Use Designation, with the exception of highways and railways*”. Therefore, the entire length of the NMLIC would not conform to the DNLUP. This is despite the intent of Mixed Use “*as illustrated in Figure 2 (2016 DNLUP; Section 1.7.5.3; page 22)*” (Figure 1 in this document) of the 2016 DNLUP. This is contradictory guidance because it clearly indicates that Transportation and Infrastructure as one of the Mixed Uses. (Figure 2; 2016 DNLUP; Section 1.7.5.3; page 22).

Further conflicting guidance is provided with regard to how the road would conform to the NLUP in Section 5.5.1.2 which states “*Linear infrastructure intended for use in all seasons is not permitted in the Protected Area designation, but is permitted within the Mixed Use designation. Individual SMAs [Special Management Areas] may have different stipulations for linear infrastructure, as show in Table 1. This is inclusive of Communication and/or Telephone Lines, Highways, Mine Bulk Hauling Roads, Mine Servicing Roads, Public Roads, Pipelines, Power lines, Private Roads and Railways.*

This appears to suggest that areas which are both a Mixed Use designation and a Special Management Area may permit the construction of Highways such as in the proposed NMLIC, but no Special Management Areas outlined in Table 1 of the 2016 DNLUP actually permit linear infrastructure. This prevents the advancement of any LIC project without first seeking an amendment to the plan.



In addition, Section 5.5.1.2 includes linear infrastructure that ranges from a local scale of kilometres to tens of kilometres (ie. mine bulk hauling and service roads) to a territorial or national scale of hundreds to thousands of kilometres (ie. highways, power lines, railways and pipelines). Separate categories of linear infrastructure based on the scale needs to be considered in the DNLUP. This would also recognize the significantly higher costs and longer development time lines required to develop the NMLIC.

**Figure 1. Mixed Use**



Items 2.1 to 2.4 show the inconsistent and contradictory information in the current DNLUP, which does not allow any LIC to conform. This is a significant barrier to advancing the NMLIC, or any LIC, now or in the future. It is recommended that the NPC eliminate these inconsistencies in order that the NMLIC will conform to the DNLUP.

## 2.5 Sufficient and Robust Information

The 2016 DNLUP provides six questions under Annex A1 which must be answered by proponents seeking to demonstrate that the route for a proposed LIC has been robustly determined. The following answers to these six questions for the NMLIC based on the scoping scale technical reports already completed (Nishi-Khon/SNC Lavalin. 2007) demonstrates that sufficient and robust information exists to permit inclusion of a defined land use designation into Schedule A and Table 1 of the 2016 DNLUP.



**Question 1:** The LIC will originate in Sundance, Manitoba.

**Question 2:** The LIC will terminate in Rankin Inlet, Nunavut. Spur corridors will extend into Churchill, Arviat and Whale Cove.

**Question 3:** The selection of a preferred route from the three potential routes considered was based on a Multiple Account Evaluation (MAE) framework that was based on five accounts:

- i) Financial Account
- ii) Transportation Benefits Account
- iii) Social/Community Account
- iv) Natural Environment Account
- v) Economy/National Interest Account

**Question 4:** The process of elimination of all possible routes to all possible destinations was based on the following factors:

- i) Terrain Classification
- ii) Capital Costs
- iii) Traffic Volumes for freight and passengers
- iv) Major Bridge Crossings
- v) Proposed Traveller Services
- vii) Climate Change
- viii) Alignment Alternatives
- ix) Route Engineering
- x) Environmental and Social Assessments
- xi) Economic Assessment
- xii) Community and Stakeholder Consultations

**Question 5:** The LIC will be permanent. Funding, operation and maintenance costs are available in 2006 dollars for the all-weather road component and 2015 dollars for the power line component. The funding approach would build on the existing partnership between the Kivalliq Inuit Association, Hudson Bay Regional Roundtable, Government of Nunavut (GN) and Government of Canada (GC). This partnership is capable of having access to the recently announced Canadian Infrastructure Bank. This funding approach would be similar to the GN, GC, Kitikmeot Inuit Association and Nunavut Resources Corp. for the Grays Bay LIC.

**Question 6:** The LIC will be public and will include a road. Funding, operation and maintenance costs are available in 2006 dollars for the all-weather road component and 2015 dollars for the power line component. The funding approach would build on the existing partnership between the Kivalliq Inuit Association, Hudson Bay Regional Roundtable, Government of Nunavut (GN) and Government of Canada (GC). This partnership is capable of having access to the recently announced Canadian Infrastructure Bank. This funding approach would be similar to the GN, GC, Kitikmeot Inuit Association and Nunavut Resources Corp. for the Grays Bay LIC.





### **3.0 Recommendation**

The 2016 DNLUP must be amended in order to incorporate the NMLIC as a recognized LIC. The lines of evidence outlined in section 2.0 are more than sufficient to allow this without compromising the overall goals of the 2016 DNLUP.

The Kivalliq Inuit Association and NTI, in partnership with the Hudson Bay Regional Roundtable, the Government of Nunavut (GN) and the Government of Canada (GC) should pursue a funding agreement with the recently announced Infrastructure Bank. This funding would be used to complete a pre-feasibility study and map out the permitting process for the NMLIC through the Manitoba, Nunavut and federal jurisdictions. The goal of this work would be to prepare a Project Description and Draft Environmental Impact Statement (DEIS) for submission to the appropriate Nunavut and Manitoba permitting organizations.

Exclusion of the NMLIC from the 2016 DNLUP will have significant negative impacts on the future of economic development in the Kivalliq Region, Nunavut and Canada.

### **4.0 References Cited**

Chen, E. and Miller, G.E., 2013. Socioeconomic status and health: mediating and moderating factors. *Annual Review of Clinical Psychology*, 9, pp.723-749.

Energy Options Working Group, 2015. Hydroelectric Power from Manitoba to the Kivalliq Region of Nunavut Land Use Plan. 140p.

Guay, N. and Beaudry, D., 2014. Work Plan Energy and Development Opportunities. Hudson Bay Regional Roundtable. 10p.

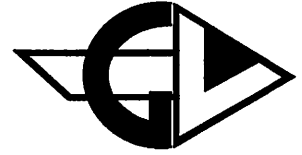
Kivalliq Inuit Association, 2016. Technical Review of the 2016 Draft Nunavut Land Use Plan. 24p.

Manitoba Hydro, 1999. Churchill to Kivalliq Region – Transmission Pre-Feasibility Study, Canada-Manitoba Economic Development Partnership Agreement, 155p.

Nishi-Khon/SNC Lavalin. 2007. Nunavut-Manitoba Route Selection Study: Final Report. Prepared for the Kivalliq Inuit Association, Government of Nunavut, Government of Manitoba and Transport Canada. 78p.

Nishi-Khon/SNC Lavalin, 2010. The case for the Nunavut-Manitoba Highway – Nunavut-Manitoba All-Weather Road Business Case, 12p.

Nunavut Planning Commission, 2016. Draft Nunavut Land Use Plan. 97p.



## **5.0 Author's Technical Qualifications**

Accomplished Professional Geologist with over thirty years of mineral exploration and advanced project experience in the private sector throughout Canada. Extensive northern Canadian experience in Nunavut, Nunavik and Labrador. Management experience on advanced definition drilling programs, infrastructure studies, project related scoping studies and pre-feasibility studies. Technical advisor to the Kivalliq Inuit Association since 2005 involved in the review of DEIS and EIS for the Meadowbank, Meliadine and Kiggavik development projects.