

Reviewer Comments and Proponent Responses

Project: Mackenzie Valley Highway
 Board: Mackenzie Valley Environmental Impact Review Board
 Proponent: GNWT-INF (Infrastructure)

File/EA #: EA1213-02
 Deadline for Parties to Submit IRs: August 14, 2024
 Deadline for Parties to Reply to IRs: October 2, 2024

No.	Topic	Reviewer Preamble	Reviewer Request	Response
Mackenzie Valley Environmental Impact Review Board - Catherine Fairbairn				
1	Timelines: road construction schedule	<p>The GNWT has proposed a construction timeline that extends unusually far into the future (up to 20 years). This extended timeline introduces additional uncertainty into construction impact predictions by requiring the Review Board and parties to assess impacts based on conditions that may well change over the lengthy construction period.</p> <p>In a 2013 letter (attached) to the developer (PR#39), the Review Board previously raised this specific concern about the challenges of confidently predicting impacts given the unusual length of the proposed construction period. The Review Board expressed concern about the accuracy of impact predictions on wildlife, water resources, climate and permafrost, and socio-economics. Aspects of the environment, such as fire regime, certainly appear to have changed even since the Review Board raised the concern.</p> <p>The Board has read GNWT's statement, in section 5.4.1 of the Developer's Assessment Report, that adaptive management and ongoing engagement are sufficient to predict and mitigate impacts and uncertainties in the future. This approach relies on adaptive management to quickly detect important impacts and for those impacts to be mitigated before they become significant. The Review Board is not convinced that the assurance of adaptive management is a sufficient substitute for credible impact prediction.</p>	<p>A. How likely is the predicted or alternative construction timeline presented in the Developer's Assessment Report?</p> <p>B. Please justify and provide further details on the statement in DAR section 5.4.1 that adaptive management and ongoing engagement are sufficient to predict and mitigate impacts and uncertainties on</p>	Please see the attached document.

			<p>the environment and people once construction is complete (a minimum of 20 years from now into the mid-2040s) and the road is entirely open to the public. C. Please describe the GNWTs optimal construction schedule (that is, if financial resources are available to build the highway upon receipt of permitting approval), including:</p> <ul style="list-style-type: none">i. How long would it take to build the road from Wrigley to Norman Wells on this basis?ii. Would the GNWT consider building from multiple headings at the same time (for	
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			example, from Normal Wells, Tulita, and Wrigley simultaneously)? What would this construction schedule look like?	
2	Future environmental conditions	<p>The Review Board’s 2013 letter (as described in the preamble of IR#1 above) described concerns about the long construction schedule and the uncertainties and challenges this creates for impact prediction. The GNWT responded, on Nov. 13, 2013, that “... the assessment will also include a review of best available data relating to predicted future potential changes to baseline conditions. For example, the potential effects of climate change (sic). This data will be used in the assessment to discuss how baseline conditions may change and how that could affect the conclusions of the assessment” (PR#40).</p> <p>Section 24 and Appendix 24A provide clear evidence that climate conditions will be very different in the future than compared to historical conditions, for example in relation to permafrost. However, the Review Board sees little evidence of the GNWT considering this for most of its impact predictions in the DAR, and is not satisfied with the GNWT’s efforts to do so for the majority of valued components. In the absence of predicted future conditions as resulting from climate change, the Review Board and parties cannot adequately evaluate the likely impacts on the highway, and stemming from the highway, nor adequately evaluate the effectiveness of proposed mitigations measures.</p> <p>The Review Board understands the difficulties inherent in predicting future habitat and wildlife conditions. However, the evidence that past conditions are not likely to represent future conditions is clear (for example, looking at changes in fire regimes).</p>	<p>A. Please apply the climate projections from the Climate Lens Part II: Climate Change Resilience Assessment (Appendix 24A) and assess what this would mean for future environment conditions, including for habitat and wildlife.</p> <p>i. Please provide projections of future environmental and habitat conditions for areas that include project local and regional</p>	Please see the attached document.

		<p>A reasonable assessment approach to dealing with the range of potential future conditions is to project scenarios of environmental conditions, and assess what these mean for different valued components. These scenarios should be at a scale appropriate to evaluate project specific and cumulative effects to Key Lines of Inquiry and Subjects of Note.</p>	<p>assessment areas, as well as areas in relevant Boreal Caribou Range plans over the time periods used in Appendix 24A:</p> <ul style="list-style-type: none">- 2020s (2010 to 2039)- 2050s (2040 – 2069)- 2080s (2070 to 2099) <p>ii. As part of these projections of future environmental conditions, the developer should:</p> <ul style="list-style-type: none">- consider changes to forest fire intensity and magnitudes- consider environmental extremes such as heat, wind, precipitation, icing events- base projections on best available	
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			science and Indigenous Traditional Knowledge - provide a detailed description of assumptions and limitations	
3	Lessons Learned: Tłıchq highway	<p>On February 27, 2024, the Review Board released a Notice of Proceeding indicating it plans to transfer relevant materials from the Tłıchq All Season Road EA (EA1617-01) to the Mackenzie Valley Highway EA (EA1213-02). This information request builds on the Notice of Proceeding by asking the GNWT to analyse existing information and provide additional information about the actual and impacts, and the effectiveness of mitigation measures relating to the Tłıchq highway. In the future, the Review Board may ask additional questions about lessons learned that are specific to individual valued components.</p> <p>Many of the predicted impacts for the proposed MVH are the same or similar to the impacts that were predicted and occurred during the assessment, construction and initial operations of the Tłıchq highway. During that environmental assessment for the Tłıchq highway, the GNWT relied on existing programs and plans to mitigate many of the impacts. Similarly, in the MVH DAR the GNWT appears to rely heavily on existing programs and plans to mitigate impacts of the proposed MVH. Some engagement participants noted that GNWT programs are not adequate to deal with existing social impacts in communities along the route.</p> <p>When the predicted impacts of the Tłıchq highway happened, existing programs sometimes proved slow and only partially effective to mitigate the impacts. In addition, experience has shown that the predicted "spike" of social impacts has lasted longer than predicted and some of the impacts have been difficult</p>	<p>A. Please describe which plans and programs for the Tłıchq highway were effective in efficiently mitigating impacts when they occurred, and which were not and why not.</p> <p>B. Please describe how effectively GNWT programs are addressing current and existing impacts on communities and on wildlife that will be affected by the construction and operation of the MVH.</p>	Please see the attached document.

		<p>to detect, monitor, and adaptively manage in a timely and effective manner. Because the Tł̨chq̨ highway project precedes the MVH, it offers an excellent opportunity for lessons that may be applicable for this EA, based on the experiences of Tł̨chq̨ communities and GWNT monitoring and management plans.</p>	<p>C. For any impacts that were not efficiently or effectively mitigated when they happened during construction and operation of the Tł̨chq̨ highway, please justify:</p> <ul style="list-style-type: none">i. how GNWT programs will effectively deal with similar impacts on communities and on wildlife caused by or associated with the MVH (referencing key performance indicators where possible)ii. why the GNWT believes existing plans and programs are appropriate to mitigate additional impacts caused by or associated	
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			with the MVH iii. why the GNWT expects that the same or other proposed mitigation measures will work better for the MVH than for the Tłıchǫ highway.	
4	Socio-economic: Use of Parameters (DAR Section 9.3)	<p>Several of the parameters in Table 9.3 are not measurable due to insufficient data and so cannot be carried through the analysis. For example, the parameters used to measure social pressures (and the significant effect that is described) are specific but community-level data is lacking. This insufficiency is noted by the developer in several sections of the assessment. Some parameters are not specifically evaluated in the effects discussions. The assessment results and conclusions are at a higher level than is implied by the identified parameters.</p> <p>In responding to this IR, the Review Board requires analysis from Health and Social Services (HSS) and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	Please review the parameters and describe which are measurable and can be analyzed during the assessment and monitored into the future to validate the assessment. For those that are not measurable, please describe how a qualitative approach could be used.	Please see the attached document.
5	Socio-economic: Methods - definitions (DAR Section 9.4)	The definitions of direct, indirect, and induced effects in 9.4 do not align with the Review Board Socio-economic Impact Assessment Guidelines (see pg.31).	Please clarify and, if necessary, revise the definitions provided and confirm that	The Review Board's Socio-economic Impact Assessment Guidelines were published in 2007, and the practice of socio-economic impact assessment has continued to evolve in that time. The GNWT's definitions of direct, indirect and induced potential socio-economic effects provided in the Developer's Assessment Report (DAR) align with these definitions, and

			<p>potential socio-economic effects have been identified and characterized in a way that aligns with the Guidelines.</p>	<p>also incorporate a broader interpretation of effects to enable a more holistic assessment. The definitions used in the DAR align with the call for “continuous learning and improvement, fostering an environment of innovation and adaptation” (p.8) in the Review Board’s Evolving Environmental Impact Assessments in the Mackenzie Valley and Beyond (2020) perspective paper, reflecting more recent literature on best practices in social impact assessment (Golder, 2019).</p> <p>The GNWT’s and the Guidelines’ definitions of direct effects/impacts¹ align in the sense that direct effects occur as a direct consequence of a project. The Guidelines define these impacts as the “direct consequences of a proposed development location, construction, or operation,” which aligns with the GNWT’s definition that a direct effect “occurs at the same time and place and exhibits no intermediate effects.” Furthermore, the Guidelines’ focus on immediate socio-economic changes, such as employment opportunities or income levels, is consistent with the GNWT’s emphasis on the absence of intermediary steps in the effects pathway(s).</p> <p>The GNWT and the Guidelines’ definitions of indirect effects/impacts agree that indirect indicates a separation in time, space, or through intermediate steps.</p> <p>The Guidelines describe indirect impacts as “secondary consequences of direct impacts,” such as changes in consumption patterns or business opportunities. This aligns with the GNWT’s definition of indirect effects as interactions that “occur at a later time and space with intermediary steps”. The Guidelines do not explicitly define induced effects. The GNWT included a definition for this term, which is an effect that is “partly attributable” to the project, in order to provide more information on those economic changes that result in the production of goods and services and jobs that are associated with direct and indirect requirements and</p>
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				<p>expenditures. Induced effects result from the direct and indirect employees of the directly and indirectly affected businesses purchasing goods and services. In the DAR, induced effects are only described in the assessment of potential effects on the Employment and Economy Valued Component (see Section 9.7). This includes an assessment of induced employment, wages and salaries, benefits, Gross Domestic Product (GDP) and government revenues.</p> <p>Overall, the GNWT's definitions of effects/impacts align with those provided in the Guidelines. Therefore, the potential socio-economic effects have been identified and characterized in a way that aligns with the Guidelines.</p>
6	<p>Socio-economic: Spatial boundaries need clarifying (DAR Sections 9.2.5.1, 9.4)</p>	<p>The Local Assessment Area and Regional Assessment Area for socio-economic effects are not well-defined. Section 9.2.5.1 defines the Local Assessment Area as communities that will be directly connected by the project and are therefore most likely to experience direct, indirect, and induced effects. The Regional Assessment Area is defined as communities in the region that may also experience direct, indirect, or induced effects but which are outside the Local Assessment Area.</p> <p>Typically, a Local Assessment Area includes the area where direct and indirect effects are expected, which should include the communities in the Local Assessment Area and Regional Assessment Area for socio-economic effects, as theoretically any of these could supply labour or goods and services for project construction. The Regional Assessment Area, as typically defined for socio-economic topics, includes the Local Assessment Area, and provides regional context for the assessment of potential effects and for the cumulative effects assessment. However, in the DAR, the Local Assessment Area and Regional Assessment Area for the Project are mutually exclusive. It is also not clear why the study areas are the same for all socio-economic valued components.</p> <p>In responding to this IR, the Review Board requires analysis from</p>	<p>A. Please clarify study areas (Local Assessment Area and Regional Assessment Area) for all socio-economic valued components and provide rationales for the selection.</p> <p>B. Please clarify the study areas used for the assessment of regional and cumulative effects for all socio-economic valued</p>	<p>Please see the attached document.</p>

		HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.	components.	
7	Socio-economic: Overall Determination of Significance for Human Health and Community Wellness (DAR sections 9.5.6.4, 9.5.9.4, 9.5.12)	<p>The significant effects described for the Human Health valued component are associated with public safety and social pressures. It is clear from the engagement results, and from similar projects completed in the Northwest Territories, that the presence of a road construction workforce could negatively affect public safety in small, isolated communities, particularly for small Indigenous communities. It is also clear that the effect would likely be focused on the safety of women, girls and 2SLGBTQQIA+ people in these communities.</p> <p>The developer has identified these as significant effects. They are also identified as a key line of inquiry in the Terms of Reference and these findings are informed by community concerns, evidence from other similar projects (e.g., Tłı̨chǫ Highway) and the developer's own analysis. However, the conclusion in the summaries and in Chapter 9 is that, overall, the project's adverse effects on human health and community wellness are not significant. Since these effects are clearly of high importance to the communities and are identified as significant after mitigation is applied, the evidence and rationale for this conclusion appear to be missing.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	Please resolve the discrepancy between the findings of significant effects to social pressures and public safety, and the overall conclusion that the adverse effects on the human health valued component are not significant.	Please see the attached document.
8	Socio-economic: Confirm workforce estimate information source (DAR	The developer's estimate that 50% of the construction workforce will come from local communities and from elsewhere in the Northwest Territories was taken from the developer's own 2022 draft Developer's Assessment Report. Referring to a draft Developer's Assessment Report is not a suitable source of information for the estimated construction workforce.	A. Please provide a final current reference for the workforce estimate, including greater	Please see the attached document.

	<p>section 9.7.2.1.1)</p>	<p>Acho Dene Koe First Nation asked GNWT to make firm commitments regarding Indigenous members' training, employment, and contracting (ADKFN, comment #6). The GNWT responded that this information would be provided in the Contractor Training and Employment Plan. While details will be provided in the plan, robust estimates at this stage will help clarify the employment benefits of the construction phase.</p> <p>In responding to this IR, the Review Board requires analysis from any relevant expert departments such as Education, Culture and Employment (ECE), Industry, Tourism and Investment (ITI). Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>detail regarding the 50% Northwest Territories workforce estimate.</p> <p>B. Please confirm the number of induced direct and indirect jobs (estimated at 14,000 in 2015; Appendix 1A).</p> <p>Answers to these questions should consider GNWT's optimal schedule of 3-4 years as well as the conceptual timeline of 20 years of construction presented in the DAR.</p>	
9	<p>Socio-economic: Types of employment (DAR section 9.7)</p>	<p>The Terms of Reference require a description of "Employment opportunities for every year of construction and operation, with reference to length of employment, form of employment, skill category". Chapter 9 mentions that this information will be provided in the Contractor Training and Employment Plan. While details will be provided in the plan in the future, robust estimates at this stage will help clarify the employment benefits of the construction phase.</p>	<p>Please provide the employment opportunities for every year of construction and operation, with reference to length of</p>	<p>Please see the attached document.</p>

			<p>employment, form of employment, skill category.</p> <p>Please answer this question for both the optimal schedule of 3-4 years as well as the conceptual timeline of 20 years of construction presented in the DAR.</p>	
10	<p>Socio-economic: Effects on the cost of living and consumer prices (DAR section 9.7.5)</p>	<p>The Terms of Reference refer to "Cost of living and consumer prices for different types of goods". The in the DAR section 9.7.5, it is stated that "effect of the Project on the cost of living and consumer prices is expected to be positive" (p.9-164). The Review Board would like more details on the effects of the project on cost of living and consumer prices for different types of goods.</p> <p>In responding to this IR, the Review Board requires analysis from any relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>Please provide the cost of living and consumer prices for different types of goods.</p>	<p>Please see the attached document.</p>
11	<p>Socio-economic: Project's contribution to GDP (DAR section 9.7.3)</p>	<p>The Terms of Reference refers to the proposed project's contribution to the GDP, provided separately for direct, indirect, and induced economic activities for the regional and (to the extent possible) territorial and national economies. The developer provided this information in part (territorial and national), but it was based on a 2011 study and does not provide the details requested.</p>	<p>Please provide the project's contribution to the GDP, provided separately for direct, indirect, and induced economic</p>	<p>To answer this question with the most up to date economic information for the project's contribution to gross domestic product (GDP) an updated cost estimate is required. A revised cost estimate and updated business case for the MVH Project is under development and anticipated to be completed in early 2025.</p> <p>The 'optimal schedule' of 3-4 years referenced in the response to overarching MVEIRB IR#1 does not replace the</p>

			<p>activities for the regional and (to the extent possible) territorial and national economies.</p> <p>Please answer the question for both construction schedules: GNWT's optimal schedule of 3-4 years and GNWT's conceptual schedule of 20 years.</p>	<p>GNWT's proposed project and project construction schedule of '10 years of construction over a 20-year period' that is described in the Developer's Assessment Report. Rather, the GNWT considers the 3–4-year construction timeline an alternative method to construction. The GNWT is submitting a supplemental filing (Supplement to the Developer's Assessment Report Chapter 7: Assessment of Alternatives) to be posted on the public registry, which will provide a qualitative assessment of the accelerated construction timeline.</p>
12	<p>Socio-economic: Increasing access to education and training (DAR Section 9.6 - Education, Training and Skills - p.9-126)</p>	<p>The DAR states that the project will increase interest in education and skills training among local residents, especially during the construction phase (p.9-127). However, residents expressed concerns regarding the GNWT's ability to meet demand for education and training (p.9-129). Residents suggest building a satellite campus of Aurora College to provide improve access to training (p.9-134), which "the GNWT is not committing to" (p.9-196).</p> <p>In response to residents' concerns and request, the DAR states that a Contractor Training and Employment Plan will be developed, which will include measures to address training and employment needs (p.9-128). However, the DAR also highlights difficulties to meet demand for training, even with future mitigation measures in place (p. 9-140).</p>	<p>A. Please describe how the GNWT will increase either GNWT or community capacity to educate and train residents, to meet the predicted demand for education and training of residents so they can work on the</p>	<p>Please see the attached document.</p>

		<p>As the Review Board does not have the Contractor Training and Employment Plan, it requires clarification on how education and training needs will be addressed in this Plan.</p> <p>In responding to this IR, the Review Board requires analysis from ECE and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>project. Please include any specific mitigation or approaches that will be in the Contractor Training and Employment Plan.</p> <p>B. If the developer proceeds with its optimal schedule (3-4 years), can the meet education needs before construction?</p>	
13	<p>Socio-economic: Opportunities for training and work (DAR Section 9.6 - Education, Training and Skills - p.9-126)</p>	<p>The developer states in the DAR that a Well-being Adaptive Management Plan would be created under the proposed Community Readiness Strategy. For now, the Review Board does not have the details of the Well-being Adaptive Management Plan.</p> <p>Indigenous women and other under-represented groups typically face more barriers to employment and are not able to benefit as much from development projects. The DAR does not adequately describe GNWT plans to support and encourage women and other under-represented groups to participate in training and work. These barriers need to be examined by the developer before the project construction begins to consider how they can be avoided or mitigated.</p> <p>In responding to this IR, the Review Board requires analysis from ECE and any other relevant expert departments. Please make it</p>	<p>Please describe any strategies the developer intends to use to limit barriers or encourage participation of women and other under-represented groups in training, skills development, and job opportunities.</p>	<p>Please see the attached document.</p>

		clear what information was provided by each department and how that information was used in the developer's response.		
14	Socio-economic: Economic assessment based on up-to-date models and structure of the Northwest Territories economy (DAR section 9.7.2.1.1, Table 9.16)	The economic effects of the Mackenzie Valley Highway are important when considering the cost of its construction. It is therefore important that the modelling work provides an appropriate level of confidence and relates to this project. The use of the Inuvik-Tuktoyaktuk Highway estimates (2011) as proof of potential expected employment and income effects arising in the Northwest Territories from construction is inappropriate. Further, with the completion of the Inuvik-Tuktoyaktuk Highway, actual outcomes from that project could have been provided, rather than estimates, if the point was to feature an example.	Please provide an assessment of the potential economic effects using up-to-date models based on current structures of the Northwest Territories economy. Please consider both the optimal schedule of 3-4 years as well as the conceptual timeline of 20 years of construction presented in the DAR.	To provide an assessment of the potential economic effects on the Northwest Territories economy, updated economic figures are required. A revised cost estimate and updated business case for the MVH Project is under development and anticipated to be completed in early 2025. As mentioned in the response to MVEIRB IR 11, the 3–4-year construction schedule is an alternative method of construction. The GNWT is submitting a supplemental filing (Supplement to the Developer's Assessment Report Chapter 7: Assessment of Alternatives) to be posted on the public registry, which will provide a qualitative assessment of the accelerated construction timeline. The analysis of the potential economic effects will be carried out for the project construction schedule of 20 years.
15	Socio-economic: Tourism identified as being an expected driver of induced employment (DAR section 9.7.2.1.2)	The developer reports that during engagement it heard potentially affected parties identify tourism as being an expected driver of induced employment. Is this the developer's expectation? The Developer's Assessment Report does not contain adequate follow up or research into community predictions or expectations. For example, as it relates to tourism, it might be possible to study the experience of Tuktoyaktuk with the Inuvik-Tuktoyaktuk Highway, or Whatì with the recently opened Tłı̄ch̄o All-Season Road. In responding to this IR, the Review Board requires analysis from ITI and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.	Please clarify and elaborate on predictions for tourism numbers and the economic effect of those tourists on the Local Assessment Area and Regional Assessment Area community economies.	Please see the attached document.

16	<p>Socio-economic: Use actual data from the Inuvik-Tuktoyaktuk (Tuk) Highway or other active and relevant road O&M rather than the predicted effects (DAR section 9.7.2.1.2, Table 9.17)</p>	<p>It is stated that annual employment estimates were derived based on maintenance estimates for the Inuvik-Tuktoyaktuk Highway. These estimates were prepared in 2011 and likely based on modelling of an economy in 2007 (or 2008 at the latest). If the Inuvik-Tuktoyaktuk Highway is the reference, then estimates for the Mackenzie Valley Highway should be based on actual employment records from the Inuvik-Tuktoyaktuk Highway, given that it has been operating for some time.</p> <p>Alternatively, the developer might want to consider the actual employment and costs associated with operating and maintaining the new Tł̄chq̄ All-Season Road, or use the employment and costs associated with operating and maintaining the highway between Fort Simpson and Wrigley.</p>	<p>A. Please provide actual (not estimated) employment records experienced by similar roads that are open in the Northwest Territories as part of the employment and operation and maintenance costs, with adjustments that might be needed to account for differences between the highway projects.</p> <p>B. Please model the economic effects of employment using up-to-date economic data and current structure of the territorial economy.</p>	<p>Please see the attached document.</p>
17	<p>Socio-economic: Mitigation</p>	<p>The developer has proposed a Community Readiness Strategy and a Community Readiness and Wellbeing Adaptive Management Plan that appears to be centred on government's core activities such as</p>	<p>Please provide an explanation as to the content</p>	<p>Please see the attached document.</p>

	<p>verification (DAR sections 9.7.2.2, 9.16.2.2.1)</p>	<p>education services, economic development offices, college courses, and communication of these services. The Strategy proposes a series of committees or plans focussed on the communication of these existing government services.</p> <p>It is unclear if and how these proposed mitigation measures will be modified or adapted specifically for the Mackenzie Valley Highway or if the services will continue as usual. In the absence of the Community Readiness Strategy and a Community Readiness and Wellbeing Adaptive Management Plan, is the developer proposing new or unique mitigation related to the GNWT's core activities to respond to additional impacts and pressures resulting from the MVH? A distinction or explanation is required as otherwise, the outcome of the proposed mitigation does not extend beyond baseline conditions.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>of Community Readiness Strategy and a Community Readiness and Wellbeing Adaptive Management Plan. Include:</p> <ul style="list-style-type: none"> - whether the proposed mitigations (in the plans) are additional or just existing government programs and services - how quickly those mitigations can be implemented and take effect - if the plan will be ready before construction 	
18	<p>Socio-economic: GNWT's Business Case projects a cost of \$700 million (DAR section 9.7.3.1.1)</p>	<p>The developer acknowledges that the cost of the project will have increased since the estimate was produced in 2015. It would be important to have an estimate that is based on more recent prices.</p> <p>Changing climate conditions could substantially affect highway operations and maintenance costs.</p>	<p>A. Based on recent prices, please provide a new estimate of the project's cost of construction and annual O&M</p>	<p>The assessment carried out in the Developer's Assessment Report (DAR) was based on currently available figures at the time of drafting. A revised cost estimate and updated business case for the MVH project is under development and anticipated to be completed in early 2025. The updated estimates will be provided for the costs of construction and operations and maintenance (O&M), and how O&M costs might vary for the climate change scenarios mentioned.</p>

			cost. B. Please predict how operations and maintenance costs would vary for the different climate change scenarios described in the Review Board's overarching IR#2.	
19	Socio-economic: Annual cost of O&M is unclear (DAR section 9.7.3.1.2)	Table 9.19 provides the estimated effect of annual operations and maintenance (O&M) expenditure on GDP but does not provide an estimate of expenditures that was used to determine these results. The Nichols Draft Economic Study of the Mackenzie Valley Highway Upgrade provides estimates, but that report is not referenced in Chapter 9. That report states annual O&M will be \$1.7 million, replacing \$0.6 million from the winter road O&M. It is not clear what numbers are being used in the Developer's Assessment Report.	Please provide the annual cost of O&M used to determine the economic effects estimates in the DAR.	Please see the attached document.
20	Socio-economic: The economic effects related to the loss of winter road (DAR section 9.7.3.1.2)	The DAR states that economic effects related to the loss of winter road construction and maintenance are "not estimated at this point pending information on their current costs". The developer has not indicated when it will provide these economic effects evaluations. The DAR states that "much of the [capital expenditures] are expected to be spent on local sources of goods, services, and labour", without identifying which goods and services. The developer has not provided additional information to support the statement. In responding to this IR, the Review Board requires analysis from Finance and any other relevant expert departments. Please make it	Please provide the overall net effects on the economy, considering the loss of annual winter road construction and operation and maintenance.	The GNWT is unable to answer this question in full at this time. As of 2023, the current Mackenzie Valley Winter Road from Wrigley to Norman Wells, including the Tulita ice crossing, cost approximately \$1.1 M to construct and operate and maintain. Without knowing the estimated cost of operating and maintaining the Mackenzie Valley Highway the net effect on the economy cannot be determined. The assessment carried out in the DAR was based on currently available figures at the time of drafting. A revised cost estimate and updated business case for the MVH Project is under development and anticipated to be completed in early 2025.

		clear what information was provided by each department and how that information was used in the developer's response.		<p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review, and approval of this response: Environment and Climate Change, Finance, Infrastructure, and Justice.</p>
21	Socio-economic: Increase in contracts for businesses (DAR section 9.7.4.1.1)	<p>The DAR states that "much of the [capital expenditures] are expected to be spent on local sources of goods, services, and labour", without identifying which goods and services. The developer has not provided additional information to support the statement.</p> <p>In responding to this IR, the Review Board requires analysis from any relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	Please describe, in general terms, the goods and services that can be provided by local sources.	Please see the attached document.
22	Socio-economic: Increased access to harvesting will reduce the availability of traditional foods (DAR section	The developer states that "the project may increase access to harvesting and trapping areas that were previously more difficult to access outside of the winter road season. Increased competition for wildlife could in turn reduce the availability of traditional foods for community consumption and increase reliance on store-bought foods to supplement diets." This effect was reiterated in the GNWT's answer to Review Board's comment #7. This is an assumption without supporting information and analysis, such as from the Tłı̄chq Highway or Inuvik-Tuktoyaktuk Road.	Please clarify how an increased distribution of harvesters will result in a reduction of traditional foods and increase reliance on	Please see the attached document.

	9.7.6.1.2)	In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.	store-bought foods.	
23	Socio-economic: Confirm construction costs and payment arrangements between the GNWT and Canada (DAR Volume 1 (Introduction and Project Description) (2 of 3); Project Description)	The project description suggests the construction cost of the Mackenzie Valley Highway will be shared 75%/25% between Canada and the Northwest Territories, respectively. This assumption was put forward based on an estimated \$700 million Project cost. The cost of the project has risen since 2015 when it was first estimated. It is not clear from the project description if these arrangements still pertain or if cost increases bring into question the affordability and cost-benefit considerations.	A. Please provide an update on how GWNT intends to finance the project construction based on up-to-date project cost estimates. B. Please describe how GNWT intends to fund annual operations and maintenance, and what effect this would have on annual operations and maintenance budgets for existing highways.	Please see the attached document.
24	Socio-economic: Indirect and induced effects presented appear to be inflated (DAR	The Nichols 2014 Draft Economic Study of the Mackenzie Valley Highway Upgrade presents results that appear exaggerated by a significant amount when compared to the latest Input-Output Tables for the Northwest Territories. The draft report is also mentioned in the Appendices but not in Section 9.7 of Chapter 9. It is not clear how the results of this study influenced the Developer's Assessment Report or the developer's expectations regarding the	Please provide a detailed explanation of the economic model and how its results were incorporated	The Nichols 2014 Draft Economic Study of the Mackenzie Valley Highway Upgrade was not used in the assessment contained in the Developer's Assessment Report. The draft Nichols report was included as an appendix to the DAR submission for the purpose of completeness, and not as a reference that informed the assessment of potential economic effects associated with the Project.

	Volume 1 (Introduction and Project Description) (2 of 3); Appendix 4)	economic effects of the proposed project.	into the assessment.	<p>As stated in Section 9.7.3 of the DAR, the model used to assess the economic effects of the Project was the NWT Bureau of Statistics Input/Output model that was used for the Environmental Impact Statement for the Construction of the Inuvik – Tuktoyaktuk Highway. This model was used to determine estimates for GDP and government revenue due to the Project. The output of this economic model was supplemented with other data sources including census data provided by the NWT Bureau of Statistics, qualitative feedback from communities, and data on experiences from similar projects in similar environments.</p> <p>The assessment carried out in the DAR was based on currently available figures at the time of drafting. A revised cost estimate and updated business case for the MVH Project is under development and anticipated to be completed in early 2025.</p> <p>Upon receipt of the revised cost estimate and business case, INF will work with our consultants to prepare a public facing document for submission to the Board as some of the financial components may be sensitive and could negatively impact future procurement activities.</p>
25	Socio-economic: Approval to use community services (DAR section 9.8)	The developer mentions that it "will obtain approval and agreement from the Town of Norman Wells, the Hamlet of Tulita and Wrigley to use their community water supplies, their sewage lagoon and solid waste disposal facilities." The developer has not indicated what it would do if community infrastructure or services are unavailable, for example if they are already at capacity.	A. Do the communities of Wrigley, Tulita, and Norman Wells have the capacity to support the use of water, sewage, and solid waste infrastructure for the highway?	<p>A. While the communities of Wrigley, Tulita, and Norman Wells have waste management facilities, the GNWT is yet to determine the capacity of each community to support the management of wastes generated by the Project. The GNWT intends to engage with each respective community government to establish the capacity of their waste management facilities and will then negotiate agreements for provision of potable water and to receive project wastes accordingly (Section 5.4).</p> <p>B. Waste in excess of community capacities and waste that cannot be accepted by community facilities will be disposed</p>

			<p>B. Please describe how GNWT will manage water, sewage, and solid waste if it is not feasible or acceptable to use communities' infrastructure and services.</p>	<p>of in accordance with acceptable industry standards and the approved Waste Management and Incinerator Management Plans for the Project.</p> <p>If municipal facilities are unable to accept solid waste, containerized waste will be transported by road to an alternate accredited facility approved to accept the wastes. As mentioned in Section 5.4.12 of the DAR, there are currently no facilities in the Sahtu or Dehcho regions licensed to accept and manage recyclables or hazardous wastes from commercial operations. Recyclable wastes and hazardous wastes will be backhauled for disposal and/or recycling at accredited facilities capable of accepting such wastes within or outside of the NWT. After construction, any remaining equipment, scrap materials, and waste that cannot be disposed locally could be demobilized by truck and disposed of in an approved facility at the end of construction.</p> <p>Each camp will include waste transfer and temporary waste management facilities. The management of solid waste from camps and construction activities may also include incineration. Wastes suitable 2 for incineration, such as food waste and cardboard, will be incinerated on site following applicable guidelines and the approved Incinerator Management Plan.</p>
26	<p>Socio-economic: Canadian average for health indicators (DAR chapter 9)</p>	<p>To understand the effectiveness of current GNWT health and wellness programs, it would help to compare indicators of health and wellbeing in the communities along the project against Canadian averages. Looking at what is already working, and what is not, can help indicate which existing issues are already significant and how well GNWT programs may mitigate additional impacts, such as cumulative impacts that may arise from the MVH.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how</p>	<p>Please provide a comparison of human health and community wellness indicators in the Local Assessment Area against the Canadian averages.</p>	<p>Please see the attached document.</p>

		that information was used in the developer's response.		
27	Socio-economic: Increasing resilience to face health issues (DAR section 9.5.3.2)	<p>The developer acknowledges that the project will exacerbate existing health and wellbeing issues (about population health, community/family and social ties, food security, social pressure, nuisance, water quality, public safety, and social determinants of health (Table 9.10)). Engagement mentioned the need to resolve existing health needs and health services issues before the project becomes operational (p.9-79). The developer also acknowledges an upcoming increase in demand for counselling, emergency services, and protective services (p.9-182). Residents of Norman Wells and Tulita stated during engagement that health services are already at maximum capacity (p.9-180).</p> <p>For example, Tulita residents note the risk of increased drugs and alcohol in the community, and the resulting increase in demand for counselling, facility-based treatment, emergency services, and protective services (p.9-182). Tulita and Norman Wells residents also point out that health services already are at maximum capacity, and that the community lacks mental health, suicide prevention, addictions, or social workers (p.9-180). The DAR highlights that the project will make these existing issues worse (p.9-182).</p> <p>Although the GNWT has identified a variety of plans, programs, and working groups that will be used to address problems, there are potential challenges with the time lag that may occur for these plans, programs, and working groups to identify the problem, come up with mitigation, put the mitigation into action, and reduce impacts. Initial experience with the Tłı̄chq̄ highway demonstrates this. In some cases, there are already services that are at capacity in the communities, and this project may further increase demand. For the Tłı̄chq̄ highway, it has sometimes taken time to adjust to the increase in demand (such as by getting another RCMP officer).</p> <p>Additionally, the Acho Dene Koe First Nation noted that "There is a</p>	<p>A. Please summarize any existing social or health services that are at or near capacity in the communities, and if this project might increase demand for those services, resulting in adverse impacts.</p> <p>B. Are there ways the GNWT could increase capacity or community resilience to help prevent impacts before the impacts occur, rather than waiting to respond to them after they happen?</p> <p>C. Based on "lessons learned" from the Tłı̄chq̄</p>	Please see the attached document.

		<p>serious concern that [the Well-Being and Adaptive Management Plan] will not be a satisfactory form of mitigation,” “it is unclear whether it will appropriately address all effects associated with community well-being,” and “This Plan must be co-developed with affected communities and be developed before final approval of this project” (ADKFN comment #3).</p> <p>The GNWT has stated, in its answer to ADKFN comment #3, that the Mackenzie Valley Highway Corridor Working Group will develop the Community Readiness Strategy’s plans beginning one year before construction and ending after five years of operations. The timeframe for the Community Readiness Strategy and the development of the associated plans has not been determined, but they will not be finalized before the end of the EA. GNWT will engage communities about the timeframe in 2024.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer’s response.</p>	<p>Highway, please describe which mitigation measures will be considered suitable for the Mackenzie Highway project and can be expected to be reflected in the Well-Being Adaptive Management Plan addressing social and health services.</p> <p>D. Even though the timeline is currently uncertain, does the developer plan to have the Wellbeing Adaptive Management Plan ready before construction?</p>	
28	Socio-economic: Vulnerable groups (DAR chapter 9)	The developer states in the DAR that to mitigate the predicted negative effect on public safety, a Safety and Security Plan for Vulnerable Community Members will be created under the proposed Community Readiness Strategy. The effect on public safety (social pressures) with mitigation is predicted to be significant. The Review Board requires more details of this plan.	Please provide an analysis of predicted impacts on vulnerable groups in the	Please see the attached document.

		<p>When a project is developed, there are typically some individuals who experience more of the benefits and some individuals who experience more of the negative impacts of the project. This issue can be particularly true in a small Indigenous community in the north. Often, those who experience the most negative impacts are also people who have the least power to voice the challenges they face. Although the developer has concluded that the effect on public safety will be significant, the GNWT has not adequately described how the project might affect these vulnerable groups or individuals, or how the proposed mitigation can reduce the predicted impacts.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>communities on the project route, how different vulnerable groups may be differently affected (including in multiple ways simultaneously) and identify how the proposed mitigation measures are expected to reliably reduce these impacts.</p>	
29	<p>Socio-economic: Increasing mental health and on-the-land services (DAR section 9.5.3.2)</p>	<p>The DAR states that Tulita and Norman Wells residents "indicated there was a need to address existing health needs and health service issues (e.g., staff shortages, the lack of some services associated with mental health, the need for on-the-land treatments) before the Project was operational." (p.9-79).</p> <p>The DAR responds that the developer will create a Well-Being Adaptive Management Plan that will review "existing uses and demands on health and social services and identify service needs and gaps associated" (p.9-179).</p> <p>However, an adaptive management plan is reactive, rather than preventative. If there are predicted impacts to a service that is already at capacity, those impacts should be mitigated.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how</p>	<p>Please describe any actions the GNWT will take to increase mental health services and on-the-land healing before project construction or operation.</p>	<p>Please see the attached document.</p>

		that information was used in the developer's response.		
30	Socio-economic: Existing and upcoming social issues (DAR chapter 9)	<p>According to the DAR, most socio-economic impacts will be addressed through GNWT's existing programming, and the plans proposed under the Community Readiness Strategy. However, decision-making regarding impact mitigation could be taken by the impacted communities and managed at the local level. Information on whether any authority will be deferred to communities regarding impact mitigation, and any other resources made available to them would help communities prepare.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	Describe any resources or responsibilities that are given to communities and local health and social service authorities to address social problems directly, rather than through GNWT programming.	Please see the attached document.
31	Socio-economic: Wildlife Management and Monitoring Plan implementation hiring (DAR section 11.4.2.2.1, Table 11.18 (p558))	<p>The Developer's Assessment Report states that "The GNWT will establish two positions dedicated to assisting with the implementation of the WMMP [Wildlife Management and Monitoring Plan]" (p.11-94). More information is required about how these positions will be created, who will be recruited for these positions, and what they entail.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	Please provide more details about the positions dedicated to assisting with the implementation of the Wildlife Management and Monitoring Plan. For example, will the GNWT prioritize hiring within communities? Will the GNWT use existing Sahtú and Dehcho	The roles and responsibilities for implementing the Wildlife Management and Monitoring Plan (WMMP) will be determined following input from Indigenous Governments, Indigenous Organizations and other affected parties during the overall development of the WMMP, building on the draft WMMP Version 1.0 that was provided in Volume 5 of the Developer's Assessment Report (DAR). Roles dedicated to assisting with the implementation of the WMMP are likely to be related to some of the specific monitoring activities described in Section 5 of the WMMP, for example, related to effects monitoring. The GNWT anticipates Indigenous government and Indigenous organization involvement in monitoring, which may include participation of Indigenous Guardians. The Government of the Northwest Territories (GNWT) is open to discussing with Indigenous Governments, Indigenous Organizations, and specific other affected parties, options for local involvement in implementing monitoring programs for the Project as part of the ongoing development of the WMMP. For any new GNWT positions associated with implementing the WMMP, the GNWT must follow its HR

			Guardian programs?	<p>Policies which includes its affirmative action hiring policy which gives priority to Indigenous candidates.</p> <p>The response to this Information Request has been prepared in accordance with the GNWT's Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
32	<p>Socio-economic: Implications of the short construction schedule on impacts and plans (DAR chapter 9)</p>	<p>In the DAR, impacts on human health and community wellness have been predicted for a 20-year construction timeline. This approach allowed for benefits and impacts to be spread over 20 years.</p> <p>With a 3–4-year construction timeline, impacts may be felt at a much greater magnitude. GNWT's answer to the Review Board's overarching IR#1 states that "work is underway to define an optimized schedule and potential implications for environmental and socio-economic impacts" (p.3).</p> <p>The Review Board would like more information on impacts and plans under this short construction schedule.</p> <p>In responding to this IR, the Review Board requires analysis from HSS and any other relevant expert departments. Please make it clear what information was provided by each department and how</p>	<p>A. How would a 3-4-year construction schedule change the predictions related to human health and community wellness during construction, and specifically impacts on social ties, social pressures, and public safety?</p> <p>B. How would</p>	<p>Please see the attached document.</p>

		that information was used in the developer's response.	the preparation of the many management and monitoring and adaptive management plans that the GNWT committed to in the DAR be managed to achieve the GNWT's optimal schedule?	
33	Culture, Traditional Land Use, and Harvesting: Missing measurable parameter (DAR Table 11.1)	<p>The effects pathway has identified indirect effects on the experience of Indigenous peoples, which adversely alter the perceived value of availability of traditional resources for cultural use. No measurable parameter is identified in table 11.1. It is unclear how the GNWT plans to measure this indirect effect.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>Please describe how the developer will measure changes to the perceived value of availability of traditional resources for cultural use (for example, provide the measurable parameter).</p> <p>Please provide a measurable parameter or unit of measure to qualify or quantify this indirect effect of</p>	Please see the attached document.

			availability of traditional resources for cultural use	
34	Culture, Traditional Land Use, and Harvesting: Potential effects and mitigation measure (DAR Table 11.1, Table 17, Table 22, Table 24)	<p>The mitigation as presented in Table 22 lacks organization against the proposed effects pathways and is not easily relatable to the measurable parameters presented in Table 11.1. For example, it is not clear how water withdrawal for dust suppression relates to change in access to resources or areas. The organization of the information lacks transparency.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	Please describe how the pathways in Tables 17, 22 and 24, align with which mitigation(s). Please describe mitigations for wildlife health and for indirect effect related to Indigenous peoples' experience.	Please see the attached document.
35	Culture, Traditional Land Use, and Harvesting: Supplementary recommendations (DAR Table 11.18, Table 11.19, Table 11.20, Table 11.21)	<p>The Developer's Assessment Report features mitigation measures that are not linked to a particular effects pathway. These can be found in Tables 11.18 through 11.21. The recommendations have corresponding commitments. A review of the recommendations and commitments suggest that the supplemental recommendations could have been organized against the identified effects pathways.</p> <p>One of the sources (webpage) referenced in the commitments column, Dehcho First Nations, 2011 - Traditional Knowledge Assessment of Boreal Caribou (Mbedzhi) in the Dehcho region seems to be inaccurately referenced in a number of cases. A review of the report recommendations does not match the recommendations attributed to it.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it</p>	Please rework or combine the supplementary recommendations and commitments to correspond with a particular identified effect and effect pathway, so it is clear specifically what and how the developer plans to mitigate. Once that is	Please see the attached documents.

		clear what information was provided by each department and how that information was used in the developer's response.	completed, revise the residual effects and significance determination.	
36	Culture, Traditional Land Use, and Harvesting: Measurable parameters and Units of measure lack specificity as defined in Methodology in Section 4.5.2. (DAR section 11.1.3, Table 11.1)	<p>Several of the measurable parameters and units of measurement in Table 11.1 lack specificity that allows for an evaluation of the level of change. A measurable parameter needs to provide a way to determine the level or amount of change. Change as a "potential effect" (column 1) and a measurable parameter that refers to "change" (column 3) does not allow for the evaluation of a change.</p> <p>For example, the identification of change in quality and quantity is not a measurable parameter. Additional specificity is needed to confirm significance and to support any proposed monitoring programs. For example, if the intent is to confirm post-highway construction availability of resources for cultural and traditional land use, a more specific measurable parameter might be reduction of fish numbers or size as a way of measuring overfishing pressures. Or, since this proposed project may introduce additional harvesting days (because access is not limited seasonally by the winter road), a measurable parameter might be time needed for a successful harvest, or catch per unit of effort.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>Please review and revise the measurable parameters (what you are observing) and units of measurement against them and provide more specific measures or qualitative explanations. Without these details, it will not be possible to confirm the accuracy and significance of residual effects, especially when the residual effects characterizations are specific. Better measures will also support the focus of the monitoring programs.</p>	Please see the attached document.

37	<p>Caribou and moose: Harvesting: Caribou and moose, harvest pressure, management actions (DAR Chapter 5, WMMP, 10.7.2)</p>	<p>Section 10.7.2 notes that there are gaps in current harvest knowledge and in potential increases in harvest, and that Indigenous harvest information for caribou and moose was not available and not considered in the DAR.</p> <p>It will be important to develop and implement adaptive co-management regimes for boreal caribou and moose with Indigenous Governments and organizations in the Dehcho and Sahtú regions (such as the Sahtú Renewable Resource Board).</p> <p>Future wildlife management processes and decisions will need to include regular population and harvest monitoring to ensure sustainable use of caribou and moose.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>A. Please provide examples of harvest monitoring (such as guardian programs or Traditional Knowledge-based monitoring) that have been tried on other highways (such as the Inuvik-Tuktoyaktuk Highway, Tłı̄chǫ Highway) or other regions, that may be applicable along the Mackenzie Valley Highway.</p> <p>B. Please describe any engagement with Indigenous Governments or co-management Boards on potential monitoring programs.</p>	<p>Please see the attached document.</p>
38	<p>Caribou and moose:</p>	<p>The DAR states that the MVH will increase access to resident hunting and Indigenous harvest and will increase hunting and</p>	<p>A. Please describe how</p>	<p>Please see the attached document.</p>

	<p>Harvesting: potential increase in harvest, monitoring, construction schedule (DAR section 10.2.2)</p>	<p>harvesting pressure. The DAR states that GNWT management of harvest, along with management by co-management boards, will suffice to mitigate these effects and therefore changes to mortality risk will not alter the population viability or persistence in the Local Assessment Area. However, caribou appear to be extremely sensitive to human pressures, including harvesting.</p> <p>Page 10-17 states that "it is not possible to determine absolute sustainable harvest levels for caribou". It is not clear how the caribou population in the Local Assessment Area can remain viable and persistent without knowing sustainable harvest levels, or whether an increase in harvest is affecting a local population.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>monitoring of harvest and harvest success rates could identify the need for management actions to avoid overharvesting of moose and caribou. Given available information on moose and caribou densities, what would be an expected upper range in annual sustainable harvest levels for a local population of moose and caribou that may become accessible because of the MVH Project?</p> <p>B. Please describe how the GNWT will assess whether monitored/reported levels of moose and</p>	
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			<p>caribou harvest and hunting along the highway are increasing towards or exceeding sustainable levels, including monitoring methods and intervals to estimate distribution, abundance and trend of local populations of moose and boreal caribou.</p> <p>C. Under GNWT's conceptual construction schedule in the DAR, the highway will be built in 3 segments over 20 years, likely starting from the South. Please explain how monitoring non-Indigenous hunting and</p>	
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			<p>resulting mitigation and management actions to prevent overharvesting of moose and caribou after construction of the first segment (Wrigley to Dehcho border) could inform monitoring management actions to prevent overharvesting for the following two highway segments.</p> <p>D. How would non-Indigenous hunting monitoring and management occur if segments were built in a different sequence or simultaneously, such as under GNWT's optimal schedule</p>	
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			<p>described in response to Review Board overarching IR #1?</p> <p>E. Please provide quantitative and/or qualitative estimates of non-Indigenous hunting of moose and caribou along the Tłı̄chǫ Highway since it has been opened to the public. Considering the proximity of the non-Indigenous population in Yellowknife to that highway, please compare and contrast predicted levels of non-Indigenous hunting of wildlife along the MVH segments as they are</p>	
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			constructed.	
39	Culture, Traditional Land Use, and Harvesting: harvest pressure and mitigation (DAR Chapter 11, 11.1.2, 11.4.2.2.1,, table 11.18)	<p>Section 11.1.2 describes the influence that project engagement had on the chapter on impacts to culture, traditional land use and harvesting and non-Indigenous hunting. One concern raised is about a potential increase in non-resident hunters' access to wildlife within the Regional Assessment Area.</p> <p>Table 11.18 lists mitigation recommendations by Indigenous organizations. One recommendation (p11-94) to mitigate impacts on overharvesting is to "Implement a 5–10-year moratorium on hunting to protect and monitor the baseline of caribou and moose and to protect large ungulates (more targeted) (Dehcho First Nations) 2011)." The GNWT commitment for this recommendation (11-94) was that "The WMMP [Wildlife Management and Monitoring Plan] will be designed to determine if the highway is resulting in a pattern or level of harvest mortality for moose and caribou that would suggest a conservation concern or need for additional harvest management actions.</p> <p>Boreal caribou are a species at risk. Eliminating resident (non-Indigenous) hunting of boreal caribou along the new all-season highway corridor is one way to mitigate the impacts of direct mortality from the Mackenzie Valley Highway to boreal caribou.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	A. Please describe strategies and options for managing harvesting and hunting for sustainability during road operations, with consideration for a short-term moratorium (5-10 year) on resident (non-Indigenous) hunting after completion of each of the three highway segments to allow time to better understand caribou and moose populations along the road corridor, to ensure mortality is sustainable and that overharvesting does not occur.	Please see the attached document.

			<p>B. Considering the GNWT's optimal schedule described in response to Review Board overarching IR #1, please describe strategies and options for managing sustainable harvesting and hunting during road operations, with consideration for a short-term moratorium (5-10 year) on resident (non-Indigenous) hunting after completion of the highway to allow time to better understand caribou and moose populations along the road corridor, to ensure harvesting and</p>	
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			<p>hunting is sustainable and that both overharvesting and overhunting does not occur.</p> <p>C. Based on lessons learned from the Tłıchǫ Highway, describe how the WMMP will determine if the highway is resulting in a level of harvest that would suggest a conservation concern. Describe the section of the WMMP for the Tłıchǫ Highway dealing with determining where harvest was nearing a conservation concern and report on implementation and effectiveness of any</p>	
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			<p>management action in the Tłjchq Highway WMMP.</p> <p>Describe why the GNWT expects the WMMP to be sensitive and efficient enough to detect, evaluate and mitigate impacts from harvest along the MVH that is nearing a conservation concern, in a timely manner.</p>	
40	<p>Culture, Traditional Land Use, and Harvesting: Interim Dehcho Land Use Plan (DAR section 11.1.1)</p>	<p>The Developer's Assessment Report does not mention whether the Interim Dehcho Land Use Plan was considered in Mackenzie Valley Highway planning and routing. However, the Interim Dehcho Land Use Plan will likely be implemented as a Land Use Plan during the Mackenzie Valley Highway construction, so it should be considered in the design and routing of Mackenzie Valley Highway.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>Please describe if and how the draft Interim Dehcho Land Use Plan was considered in the routing and design of the Mackenzie Valley Highway with respect to impacts on culture, traditional land use and harvesting.</p>	<p>Please see the attached document.</p>
41	<p>Culture,</p>	<p>The Developer's Assessment Report provides detailed information</p>	<p>Please provide</p>	<p>According to data gathered by the Northwest Territories</p>

	<p>Traditional Land Use, and Harvesting: Statistics from the Dehcho (DAR section 11.2.3.6.1)</p>	<p>regarding the Sahtú region, but not the Dehcho region.</p> <p>For instance, the Developer's Assessment Report states that "Within the Sahtu Region, 34% of the general population reported gathering berries (NWT Bureau of Statistics, 2019e), with 28% of the Indigenous population of Tulita and 32% of the Indigenous population of Norman Wells reporting engaging in berry gathering (NWT Bureau of Statistics, 2019b, 2019c)" and that "Within the Sahtu Region, wood is used for house heating in 274 (34%) households with 109 (13%) homes reporting wood as their main heat source (NWT Bureau of Statistics, 2018)."</p> <p>Similar information regarding the Dehcho region seems to be lacking. Of note, the data presented under the Dehcho region, while referencing DPRA 2022 is data from Statistics Canada/NWT Bureau of Statistics and should have been referenced as such.</p> <p>In responding to this IR, the Review Board requires analysis from Finance (Bureau of Statistics), ECC, and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>any similar, recent (within the last 5 years) statistics about the Dehcho region.</p>	<p>(NWT) Bureau of Statistics, within the Dehcho Region, 37.9% of the general population reported gathering berries in 2019, which is the last year for which data was available (NWT Bureau of Statistics 2023). For the community of Wrigley, 50% of the Indigenous population were engaged in berry gathering (NWT Bureau of Statistics 2019). No other secondary source information is available.</p> <p>Within the Dehcho Region, wood is used by 388 (35.7%) households, with 265 (24.3%) of households reporting wood as their main heat source (NWT Bureau of Statistics 2018).</p> <p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change • Department of Finance
42	<p>Culture, Traditional Land Use, and Harvesting: Protection of</p>	<p>Conformity requirements from the GNWT and the Sahtú Land Use Plan have been included in the Developer's Assessment Report. However, the draft Interim Dehcho Land Use Plan has not been considered in the Developer's Assessment Report.</p>	<p>Please clarify the distance from known sites and identify mitigation</p>	<p>Please see the attached documents.</p>

	culturally important sites (DAR sections 22.1.1, 11.2.5.1.1)	<p>It was noted in Chapter 11 (11.2.5.1.1) that there were sites of cultural importance in the Dehcho; for example, "a burial area that exists on both sides of the existing winter road north of Blackwater River, east of the Mackenzie River between Mackenzie Valley Winter Road KM 783 and KM 785" (p.11-74), and that "Pehdzéh Kj First Nation and Dehcho First Nations noted that Blackwater River is a special traditional area that is home to a sacred old grave, and Willow Lake River (outside of the Regional Assessment Area) is where there is a burial ground (Dessau, 2012 [PR#13])." (p.11-77). It is unclear how close the project comes to these sites and what mitigation might be in place to avoid impacts.</p> <p>In responding to this IR, the Review Board requires analysis from ECE and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	measures that will be implemented to prevent adverse impacts on known sites of cultural importance, such as the sites near Blackwater River and Willow Lake.	
43	Culture, Traditional Land Use, and Harvesting: Hyperlinks (RB ORS comments 12 and overarching IR 3)	<p>A few hyperlinks in the developer's response to Review Board questions are missing or broken. This includes:</p> <ul style="list-style-type: none"> - In the developer's response to the Review Boards Comment and Response #22, an attachment was provided for all non-functioning hyperlinks. - In the developers overarching response #3, a few links are not provided or broken too. 	<p>Provide a copy of the following documents:</p> <ol style="list-style-type: none"> 1. GNWT's Official Languages of the Northwest Territories document 2. List of GNWT's programs and services (Footnote 2 overarching response #3) 3. World Health Organisation Europe. Alcohol 	<p>Please find attached the requested documents.</p> <p>The list of GNWT's programs and services can be found here: https://www.gov.nt.ca/en/services/funding-programs</p>

			<p>and COVID-19: what you need to know. WHO 2020.</p> <p>4. British Academy. The COVID Decade: Understanding the long-term societal impacts of COVID-19. 2021</p> <p>5. Doerr, S.H.; Santín, C. Global trends in wildfire and its impacts: Perceptions versus realities in a changing world. Philos</p> <p>Going forward, please ensure all hyperlinks are working and are formatted accurately.</p>	
44	<p>Caribou and moose: Assessment boundaries: Clarify scale for LAA and assessment endpoints</p>	<p>As noted in the DAR, caribou and moose are wide-ranging ungulates that require different habitats throughout the year. The developer has selected a Local Assessment Area and Regional Assessment Area that are the same, at 15 km on either side of the ROW. This likely is not appropriate for population assessment endpoints for either species. The developer also seems to indicate that the LAA, on its own, cannot support a caribou population, so it is unclear how the assessment endpoints related to effects in this</p>	<p>A. Considering that the Local Assessment Area does not support a local population, please describe how the</p>	<p>Please see the attached document.</p>

<p>(DAR Pages 10-57, 10-52, 10-101)</p>	<p>region are relevant.</p> <p>In 10.1.4, the developer states:</p> <ul style="list-style-type: none"> • “Neither moose nor caribou have discrete population or population management boundaries that would directly relate to the project's potential residual or cumulative effects” (p.10-10). <p>In 10.1.6, the developer states:</p> <ul style="list-style-type: none"> • “A significant adverse residual effect on caribou and moose is one that...: 1) causes or further contributes to the exceedance of a conservation-based threshold; or 2) threatens the long-term persistence or viability of caribou and moose populations in the Caribou and Moose Local Assessment Area. <p>The DAR concludes that “the Project... is not expected to contribute to measurable changes in movement, mortality risk and health of boreal caribou in the Caribou and Moose Local Assessment Area” (p.10-107). It is unclear how the assessment of effects in the Local Assessment Area is scaled up to assess the persistence and viability of caribou (and moose) populations at a geographic scale needed to provide habitat for a caribou population.</p> <p>A biologically relevant spatial scale that reflects population-level processes would provide a useful basis to assess impact predictions from the project on the distribution, abundance, persistence and viability of local populations of boreal caribou and moose. The spatial scale for predicting population-level effects should align with the study areas used for population monitoring.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer’s response.</p>	<p>predicted impacts in the Project Development Area and Local Assessment Area are scaled up to estimate demographic impacts and long-term persistence or viability of boreal caribou and moose populations at relevant spatial scales that can support viable or self-sustaining populations.</p> <p>B. If the area required for a self-sustaining population is larger than the Local Assessment Area, please describe what area would be required for a local self-sustaining population.</p>	
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			Please describe biological and ecological rationales for scaling up analyses and predictions derived in the Local Assessment Area, to apply population assessment endpoints for caribou and moose.	
45	Caribou and moose: Assessment boundaries: Getting data to support a Local Assessment Area/Regional Assessment Area (DAR section 10.2.2)	<p>Understanding caribou movements may help determine an appropriate scale for the assessment of effects of the road on a local population. Data from collared caribou may be valuable in determining appropriate scales for assessment as well as assessing and mitigating impacts on movement. For example, Figure 3.1 in the Technical Data Report (Appendix 10A) shows boreal caribou collar locations from 2003-2023. In addition to assessing habitat availability at broad scales, DeMars et al. (2020) assessed habitat selection of collared caribou within individual annual home ranges.</p> <p>The developer has also provided a technical report (EDI 2024) on analyses of GPS telemetry data from 21 collared boreal caribou cows. The report showed the movement trajectories of those animals (Figure 2 in EDI 2024), but it did not provide any additional details on the individual collared caribou. Annual range use by the collared caribou that have interacted with the MVH Project is important context to understand road effects.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it</p>	A. Please provide a descriptive summary (with maps and figures) of the individual home ranges (based on minimum convex polygons and capture locations) of collared caribou cows (that is, the 21 individuals identified in DEDI 2024) that occur on or near the Local Assessment Area	Please see the attached document.

		<p>clear what information was provided by each department and how that information was used in the developer's response.</p> <p>References DeMars, C. A., J. Hodson, A. Kelly, E. Lamontagne, L. Smith, K. Groenewegen, T. Davidson, S. Behrens, D. Cluff, and E. Gurarie. 2020. Influence of land cover, fire and human disturbance on habitat selection by boreal caribou in the NWT. Government of the Northwest Territories Unpublished Report, Alberta Biodiversity Monitoring Institute, Department of Environment and Natural Resources, GNWT, University of Maryland. Environmental Dynamics Inc. (EDI). 2024. Mackenzie Valley Highway Project: Inferring the Potential Barriers to Boreal Caribou Movement. Report Prepared for K'alo-Stantec Limited for use by the Government of Northwest Territories. (PR#163)</p>	<p>and highway corridor.</p> <p>B. Please provide a summary table with key information of collared individuals (in EDI 2024), such as a) when and how long the collars were deployed on each caribou, b) the fixed rate and total locations, and c) home range area.</p> <p>C. Please provide a plain language summary of the EDI (2024) report written for a target audience of community and board members.</p>	
46	Caribou and moose: Assessment boundaries: Clarify terms used to	Section 10.1.6. The DAR provides the developer's evaluation of impacts to boreal caribou from the project. This evaluation uses language to describe impacts and the significance of these impacts to caribou from the project that uses several terms. It appears to use two different thresholds for assessing the significance of impacts on caribou. One is the 'long-term persistence or viability of	A. Please clarify what the terms or phrases listed below mean and at what spatial scale they are	Please see the attached document.

	<p>describe impacts to caribou and endpoints (DAR Pages 10-57, 10-52, 10-101)</p>	<p>the population,' and the other is the ability to 'maintain a self-sustaining population'.</p> <p>The difference between these two evaluations and how they relate to each other is not clear to the Review Board. Also, it is not clear at what spatial scale the DAR applies these terms (see also the next information request about scale). For example, the DAR appears to provide contradictory statements about caribou:</p> <p>1. The DAR states that residual effects on caribou and moose in the Local Assessment Area/Regional Assessment Area will not threaten "the long-term persistence or viability of boreal caribou and moose populations" in the Local Assessment Area/Regional Assessment Area.</p> <p>2. The DAR also states that areas of the project may not be able to sustain caribou populations, "The Project exists in an area (the Caribou and Moose Local Assessment Area and the Southern NT Range Planning Region) with a pre-existing significant habitat disturbance that cannot sustain a caribou population." (P10-103).</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>meant to apply:</p> <ul style="list-style-type: none"> - "Not alter further the population viability or persistence." - "Not expected to threaten the long-term persistence or viability" - "maintain a self-sustaining local population." <p>B. Use the information gathered through recent wildlife collar data (such as EDI 2024) to help define local populations and determine whether these local populations can be defined using these terms.</p>	
47	<p>Caribou and moose: Movement, habitat, methodology:</p>	<p>The DAR describes a range of possible zones of influence estimates that range from 1 km, 2.5 km, and 5 km (p10-11). The DAR describes the Project Development Area as the area of direct project disturbance, the 60 m right of way (ROW). However, the DAR states that a 500 m buffer was applied to the ROW to account</p>	<p>Please conduct a sensitivity analysis on the zone of influence and</p>	<p>Please see the attached document.</p>

<p>Zone of Influence (DAR Pages 10-11, 10-49)</p>	<p>for sensory disturbances, which affects how caribou use habitat near the ROW (p10-109). This is commonly called the zone of influence (ZOI).</p> <p>This appears to contradict what the PDA is supposed to be (the direct project footprint) and appears to indicate that the PDA is actually the Local Assessment Area. The DAR then provides estimates of the ZOI that range from 1 km to 5 km (p10-11). This appears to contradict the developer's assertion that adding a 500 m buffer to the PDA is conservative and captures the ZOI.</p> <p>The rationale for discounting the bigger buffers to account for ZOI effects states: "In the interest of providing comparable disturbance metrics and measures to that used by the federal government and comparable assessments, a 500 m buffer was applied to the Project's PDA to measure indirect habitat disturbance on caribou. While that buffer will not account for all indirect changes in boreal caribou habitat, it is intended to indicate anthropogenic habitat disturbance using a method comparable to the national scientific review" (10-49).</p> <p>The DAR describes GNWT's rationale for discounting the evidence provided for a greater buffer to account for ZOI. This appears to contradict statements in the DAR that the assessment is conservative. Further, the statement referenced above explicitly states that the 500 m buffer does not account for all indirect changes to boreal caribou habitat. The evaluation of project-related effects in this assessment must be included.</p> <p>The Review Board acknowledges GNWT's response to LKFN #10, which states that no further assessment of indirect impacts from the MVH to caribou habitat beyond the 500 m buffer has been undertaken. However, as noted by the DAR, the proposed use of a 500 m buffer does not account for all indirect changes to boreal caribou habitat.</p>	<p>conduct analyses of indirect habitat loss in the Local Assessment Area based on varying buffer distances, including 500 m, 1.0 km, 2.5 km, and 5 km from the Project Development Area.</p>	
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48	Caribou and moose: Movement, habitat, methodology: Indirect alteration of moose habitat (DAR section 10.4.2.3.1.4)	<p>The DAR uses a ZOI of 250 m to estimate indirect habitat loss for moose: "based on the research from Laurian et al. (2012) an indirect habitat loss of 250 m from the highway was selected" (p. 10-56).</p> <p>The 250 m ZOI was based on a review of six references and the basic rationale that the low density of roads and relatively lower vehicle traffic in the PDA would place the expected ZOI on the lower end of previously documented responses. Although road traffic volume is a key co-variate in how moose may respond spatially and temporally to a road corridor, increased hunter access is likely also an important factor in how moose will use the habitat along the road.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p> <p>Shanley, C. S., and S. Pyare. 2011. Evaluating the road-effect zone on wildlife distribution in a rural landscape. <i>Ecosphere</i> 2:art16.</p> <p>Shanley, C. S., G. P. Kofinas, and S. Pyare. 2013. Balancing the conservation of wildlife habitat with subsistence hunting access: A geospatial-scenario planning framework. <i>Landscape and Urban Planning</i> 115:10-17.</p>	<p>A. Please assess the effects of the road (and harvest access) on moose using a more comprehensive literature review that would inform a sensitivity analysis for a plausible range of buffer distances, and not a single value of 250 m.</p> <p>B. Please conduct a sensitivity analysis on the zone of influence and conduct analyses of indirect habitat loss in the Local Assessment Area based on at least three plausible buffer distances,</p>	Please see the attached document.

			such as 250 m, 500 m, and 1.0 km (following Shanley and Pyare 2011, Shanley et al. 2013), from the Project Development Area.	
49	Caribou and moose: Movement, habitat, methodology: Expected indirect alteration of boreal caribou habitat (DAR Table 10.10)	<p>Table 10.10 (p. 10-52) summarizes the “indirect loss of currently selected boreal caribou habitat” in the Local Assessment Area based on a 500 m buffer applied to the PDA. In Section 10.4.1.1 (p. 10-41), the DAR indicates that the all-year Resource Selection Function (RSF) habitat model (bin classes > 6) is the habitat basis for the effects assessment. This focus on selected boreal caribou habitat (based on RSF analyses) appears to equate all other habitats with all-season bin classes < 5 as being irrelevant to boreal caribou. This approach is likely to underestimate indirect habitat loss (table 10.8, p. 10-49) and is not consistent with ECCC’s (2020) development and application of the 500 m buffer because the reduction in habitat effectiveness is considered irrespective of habitat selection indices to caribou.</p> <p>This approach of emphasizing only “selected habitat” ignores the value of matrix habitat for boreal caribou and is inconsistent with the approach used to report on indirect habitat loss to moose. For example, the DAR states that “all the habitat in the PDA and the Caribou and Mosse LAA is considered suitable foraging and/or cover habitat for moose” (p. 10-41) and in Table 10.9, (p. 10-50) moose habitat includes areas of “common and transient use,” which are included in the overall area and relative reduction in available habitat to moose.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it</p>	<p>A. Please confirm if the GNWT assessment of indirect loss of boreal caribou habitat only includes all-season RSF bin classes > 6.</p> <p>B. If the answer to the question above is yes, please update the assessment of indirect habitat loss to caribou to include the total area of habitat within the 500 m buffer and apply the sensitivity analyses on buffer widths as</p>	<p>A. Section 10.4.1.1 of the Developer’s Assessment Report (DAR) (pg. 10-41) confirms that resource selection function (RSF) bins ≥6 were used to identify selected habitat. Selected habitat was the only area (ha) included in calculations of direct habitat loss (Table 10.8) and indirect habitat loss (Table 10.10).</p> <p>B. Please see the Government of the Northwest Territories (GNWT)’s response to MVEIRB IR#52 for the analysis update on total area disturbance calculations using a 500 metre buffer. The analysis update includes all habitats disturbed, including those that are not considered ‘selected habitat’.</p> <p>Please see the GNWT’s response to MVEIRB IR #47 for the sensitivity analyses on selected boreal caribou habitat using variable buffer widths.</p> <p>The response to this Information Request has been prepared in accordance with the GNWT’s Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p>

		clear what information was provided by each department and how that information was used in the developer's response.	requested above.	The following departments have been specifically involved in the drafting, review and approval of this response: <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
50	Caribou and moose: Assessment boundaries: Cumulative effects/Regional Assessment Area (DAR Section 10.1.4)	<p>The DAR states, “[b]ased on the species distributions, the Caribou and Moose Local Assessment Area adequately captures the potential residual and cumulative effects of the Project interacting with the effects of other past, present, and reasonably foreseeable future projects” (p. 10-11).</p> <p>Normally, project-specific EA uses a Local Assessment Area to capture the project-specific impacts to the valued components, while the larger Regional Assessment Area is used to evaluate broader cumulative effects from other past, present and reasonably foreseeable human activities. For this assessment, the Local Assessment Area only includes 15 km on either side of the proposed road, the same as the Regional Assessment Area.</p> <p>The DAR states that the rationale for this boundary is how far a caribou can walk in a day. However, boreal caribou or moose may experience effects from other projects that act cumulatively further than 15 km from the highway. The Local Assessment Area is likely not appropriate for cumulative effects. A Regional Assessment Area should be selected at an appropriate spatial scale to account for population-level processes that include seasonal movement patterns. The boundary for a cumulative effects assessment should include the area of impacts for other past, present and reasonably foreseeable human activities that could affect the same caribou as the project.</p> <p>If the proposed assessment endpoint concerns population-level predictions of self-sustainability, viability, or persistence of caribou populations the assessment needs to include a large enough geographic extent that this population could persist without the project.</p>	Please complete a cumulative effects assessment at a revised Regional Assessment Area (a larger scale than originally proposed in the DAR). This broader scale should be appropriate for evaluating the cumulative effects on caribou that encounter project impacts. This area should consider the full range of caribou in the vicinity of the project and seasonal movement patterns.	<p>A discussion on the spatial boundaries used in the assessment is addressed in the GNWT's responses to MVEIRB IR#44 and MVEIRB IR#46A. Those responses highlight the attempt to balance the relevance of the Project scale to the direct and indirect effects on habitat, movement, mortality, and health that might affect caribou and moose populations. Regardless, the cumulative effects assessment (Section 10.5 of the Developer's Assessment Report) addresses caribou interacting with the Project and seasonal movement patterns by including a range of spatial boundaries (see Table 10.18 [pp. 10-97]). Table 10.18 summarizes the Project contribution to existing cumulative disturbance at the scale of NT1, the Range Planning Regions of Sahtu and Southern Northwest Territories, and the Caribou and Moose local assessment area (clipped to the NT1 Range).</p> <p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change

		In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.		
51	Caribou and moose: Cumulative effects: Norman Wells closure (DAR chapter 10)	<p>This section states that there are no reasonably foreseeable projects that would increase the number of industrial users of the highway. However, the section states that the business case for the project is to connect Canada's road network and open new resources to benefit Canadians. One of the purposes of the road is to induce development. Even though predictions of specific future developments are speculative, new access (in this case, all-season access) often brings new development.</p> <p>Developing scenarios of future developments is one way to reasonably predict future developments in the absence of clear current development plans. This is relevant given the constructed design capacity of the highway at 200 vehicles per day. For example, the closure and reclamation of Imperial's Norman Wells operation is reasonably foreseeable and within the timeframe of the construction and operation of this project.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>A. Please conduct a cumulative effects assessment scenario for caribou and moose where future developments result in the use of the Mackenzie Valley Highway at 200 vehicles per day.</p> <p>B. Please conduct a cumulative effects assessment for caribou and moose that includes closure and reclamation of Imperial's Norman Wells operation as a reasonably foreseeable</p>	Please see the attached document.

			development. Focus on the use of a completed Mackenzie Valley Highway for those closure and reclamation activities.	
52	Caribou and moose: Habitat disturbance update (DAR Chapter 10)	<p>The severe wildfires of 2023 have affected boreal caribou habitat. The developer's evidence on the amount of undisturbed habitat at the NT1 scale, the range planning scales (Southern NWT and Sahtu), and the Local Assessment Area/Regional Assessment Area scales presented in the DAR do not account for this new disturbance. The developer has proposed the use of a habitat disturbance model to infer whether boreal caribou can maintain a local self-sustaining population. Given this change to habitat, the developer's conclusions may need revising.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>A. Please provide an update on caribou habitat in the Local Assessment Area/Regional Assessment Area that is current to 2024.</p> <p>B. The developer discusses the status of boreal caribou at a larger scale, including the south slave region and the NT1 range. Please provide an update on the state of habitat in these regions that is current to 2024.</p>	Please see the attached document.
53	Caribou and moose:	The existing Mackenzie Valley Winter Road likely affects caribou during its annual operations, and potentially impacts them as a	Please describe the effects on	Please see the attached document.

	Demographic effects (DAR section 10.4)	<p>linear disturbance throughout the year. The proposed Mackenzie Valley Highway will change the effects of road use from seasonal (~3 months) to year-round.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>demographics (population abundance, distribution, reproduction, survival) from the project. Include those effects that cause more impacts (considered additive) or those that cause different kinds of impacts without changing the total impact (considered compensatory), compared to the demographic impacts of the winter road.</p>	
54	Caribou and moose: Movement, habitat, methodology: determination that no measurable change in Local Assessment Area (DAR Chapter	<p>Chapter 10.4.3 provides a characterization of the effects of highway operations on caribou movement patterns. These findings point to a likely perpetual change in movement patterns. The literature and lessons from the Tłı̄chǫ highway would suggest that a barrier effect is likely.</p> <p>The developer has identified other effects such as increased harvesting of caribou (chapter 10.4.4.1), increased use of the area around the road for other activities (cultural and traditional use), and that the all-season road will operate year-round as opposed to the Mackenzie Valley Winter Road. There are still significant concerns that the all-season road may act as a barrier to</p>	<p>A. Please provide evidence and further discussion about the potential for the highway to act as a barrier to the movement of boreal caribou. This should consider</p>	<p>Please see the attached document.</p>

	10.4.3.3.2.3)	<p>movement and cause habitat fragmentation.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>evidence from other northern highways, such as the Tłjchq highway, and consider not only average traffic volumes but also the use of the area around the road by people.</p> <p>B. Please include an evaluation of barrier effects should the road traffic increase due to the induced development of up to 200 vehicles a day, including industrial traffic.</p>	
55	Caribou and moose: Movement, habitat, methodology: Effects to boreal caribou movement (DAR Pages 10-62, 10-63, 10-65)	<p>The DAR states that "it is not expected that project-related changes in their movement will result in a measurable change in their distribution and/or abundance in the Caribou and Moose Local Assessment Area." (10-62). The developer also states, "Based on the current use of the Mackenzie Valley Winter Road ROW and adjacent areas by boreal caribou and moose, it is not expected that project-related changes in their movement will result in a measurable change in their distribution and/or abundance in the Caribou and Moose Local Assessment Area." (10-63). The DAR also notes that the change from a winter road to an all-season road may reduce the permeability of the ROW (P10-65).</p>	<p>Please clarify the conclusion that the road is not expected to lead to a "measurable" change and whether this means a) the change is so small that it</p>	<p>Please see the attached document.</p>

		<p>The DAR also notes that there is insufficient data on boreal caribou movement to determine whether the existing Mackenzie Valley Winter Road acts as a barrier. It is not clear whether the developer is stating that changes to the movement of boreal caribou are "not measurable" means the changes are so small that they are not measurable, or if the changes cannot be measured because there is a lack of information about boreal caribou movement patterns in the Local Assessment Area.</p> <p>The Review Board acknowledges submission of the technical report: MVH - Inferring the Potential Barriers to Caribou Movement PR#163 and the response to LKFN #14.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>cannot be measured or b) if the change to movement (and possible barrier effects) cannot be measured because of a lack of existing data about boreal caribou movement patterns in the Local Assessment Area.</p>	
56	<p>Caribou and moose: Movement, habitat, methodology: Caribou and moose, wildlife crossing locations - knowledge gap (DAR Chapter 10, 10.4.4.3.2, 10.5.4.2, 10.5.5.2, 10.7.2, Table 11.18)</p>	<p>Road traffic during all seasons means some wildlife crossing locations may not be known, especially outside of the winter road season. The developer needs to know where likely wildlife crossing locations are during all seasons to implement effective mitigation that reduces or avoids direct wildlife mortality from vehicle collisions. The DAR acknowledges that wildlife-vehicle collision data along the Mackenzie Valley Winter Road is assumed to be under-reported and is identified as a knowledge gap.</p> <p>Table 10.7 and commitment #192, table 27.2, note that wildlife crossing locations will be identified and marked but do not describe how they will be identified. Crossing locations need to be identified before mitigation can be implemented, such as with signs and speed limit reduction).</p> <p>Table 11.18 includes a recommendation to install wildlife cameras. However, GNWT does not appear to have committed to this recommendation.</p>	<p>A. Please describe locations of known and predicted wildlife crossing areas for moose and caribou along the road during all seasons. Describe actions (such as camera trapping, Traditional Knowledge gathering or other means) to</p>	<p>Please see the attached document.</p>

		<p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>locate any wildlife crossing locations that are currently not known.</p> <p>B. Please describe proposed mitigations to prevent vehicle collisions with wildlife at known crossing locations. For example, the Yukon Government distributes maps of known caribou crossing locations so that vehicles can take precautions when entering areas of frequent crossings. Are there opportunities to construct ditching and road shoulder slopes to make it easier for wildlife to cross</p>	
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			<p>the road at known crossing points?</p> <p>C. Please describe how the developer will assess the effectiveness of mitigation and adaptively manage potential collision impacts and mitigation at new crossing locations that are discovered during all-season road operations.</p>	
57	<p>Caribou and moose: Movement, habitat, methodology: Gaps and uncertainties Boreal caribou movement and response to Mackenzie Valley Winter Road (DAR section 10.7.2)</p>	<p>Boreal caribou response to the Mackenzie Valley Winter Road is identified as a knowledge gap. The DAR states that a study of collared caribou in the region will be available during the project review to better understand movement patterns in the study area. On February 27, 2024, the developer submitted a study titled "Mackenzie Valley Highway Project: Inferring the potential barriers to boreal caribou movement" (EDI 2024; PR#163).</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>Please provide the following:</p> <p>A. Describe if and how the study will be used to reassess the impacts of the MVH on movement, potential barrier effects of the all-season road, and distribution of caribou.</p>	<p>A. A description of how the caribou collar study was used to assess the potential movement, distribution, and barrier effects of the Project on boreal caribou was addressed in the Government of Northwest Territories' (GNWT) response to ORS LKFN-14.</p> <p>B. Sections 5.2.2 of the Wildlife Management and Monitoring Plan (Boreal Caribou Collar Program) and 5.2.3 (Boreal Caribou Collar Analysis) indicate that the GNWT Department of Environment and Climate Change will continue with a caribou collaring program as part of effects monitoring for the Project. Those sections describe the intent of the continued collar studies. Ongoing collar-based monitoring during project construction and operations will compare boreal caribou movement data analyzed in relation to the Mackenzie Valley Winter Road with movement analysis to be conducted in</p>

			<p>B. Describe options for a continued and improved study design to further understand caribou movements in response to an all-season highway; and</p> <p>C. suggest updated mitigations based on updated knowledge of caribou movements from the EDI (2024) collar study.</p>	<p>relation to the Project. The study results will be reported annually if the Project is approved.</p> <p>C. The GNWT is not recommending any additional mitigation measures based on the EDI (2024) caribou collar study findings. The GNWT will continue to investigate if there are features such as topographical pinch points (or funnels) that would mean wildlife are more likely to cross in those areas and where it may be beneficial to place signage or to implement speed reductions.</p> <p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
58	Caribou and moose: Cumulative effects: modelling (DAR section 10.5)	<p>The DAR does not clearly describe key sources of uncertainties in impact predictions on caribou and moose habitat and populations. The Board needs to understand these to evaluate the credibility of predictions for this Key Line of Inquiry.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>Please describe the key sources of uncertainty in project-level effects to caribou and moose habitat and populations. Will the developer be</p>	<p>Section 10.7 (Prediction Confidence) of the Developer's Assessment Report (DAR) identifies key sources of uncertainty related to predicted residual effects of the Project on caribou and moose, the determination of significance, and assumptions (Section 10.7.1) used in the assessment. A summary list of 15 key gaps and uncertainties is provided in DAR Section 10.7.2. Uncertainties include those regarding habitat models, interactions, harvest data, specific responses of individuals and populations, and data limitations. In most cases, uncertainty results from insufficient empirical evidence</p>

			<p>conducting more studies to address, confirm, and test assumptions and predictions for residual effects? If so, please describe them.</p>	<p>of how caribou and moose will specifically respond to the Project, rather than a paucity of data in the general wildlife literature regarding effects. Those uncertainties are generally universal to all projects, and follow-up monitoring to track potential effects predictions as described below are planned to address the uncertainties.</p> <p>The GNWT proposes several studies to address, confirm, and test assumptions and predictions of residual effects of the Project on caribou and moose, and to collaborate with resource management organizations such as the Sahtú Renewable Resources Board to address uncertainty related to harvested resources in the study areas. The assessment conservatively identified various follow-up monitoring program requirements to reduce uncertainty in the DAR Section 10.8 (Follow-up Monitoring and Management). The draft Wildlife Management and Monitoring Plan (DAR Volume 5) details the proposed follow-up programs and will be required prior to construction and operation of the highway.</p> <p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response: • Department of Infrastructure • Department of Environment and Climate Change</p>
59	Caribou and	Section 10.4.6 of the DAR provides a summary of the residual	Please describe	Please see the attached document.

	<p>moose: Movement, habitat, methodology: Combined project effects to Boreal Caribou (DAR section 10.4.6)</p>	<p>effects of the project. This section describes the conclusions individually for changes to:</p> <ul style="list-style-type: none"> • habitat, • movement, • mortality risk, and • health. <p>There is no discussion about the combined residual project effects on caribou. There is concern that individual effects pathways might be minor, but when considered collectively, they may have an overall collective impact on caribou that matters and requires further mitigation.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>and evaluate the combined, collective residual project effects to boreal caribou (that is, the total effects), integrating the project-specific impacts, including caribou habitat, movement, mortality risk and health. Consider how a potential barrier effect caused by the all-season road could affect caribou movement and distribution.</p>	
60	<p>Caribou and moose: Movement, habitat, methodology: Definitions of select habitat and critical habitat (DAR section 10.49)</p>	<p>In its definition of critical habitat for boreal caribou, Environment Canada (2012) states the following:</p> <ul style="list-style-type: none"> • Critical habitat for boreal caribou is identified as: i) the area within the boundary of each boreal caribou range that provides an overall ecological condition that will allow for an ongoing recruitment and retirement cycle of habitat, which maintains a perpetual state of a minimum of 65% of the area as undisturbed habitat; and ii) biophysical attributes required by boreal caribou to carry out life processes. • The biophysical attributes for boreal caribou critical habitat are categorized by the types of habitat used by boreal caribou in accordance with seasonal and life-stage activities, which include 	<p>A. Please clarify why the DAR appears to assess project-related effects based only on the definition of critical habitat using the 65% disturbance threshold but does not assess</p>	<p>Please see the attached documents.</p>

		<p>broad scale, calving, post-calving, rutting, wintering, and travel.</p> <p>The DAR states that critical life stages for boreal caribou are 1) late winter, and 2) calving/post calving. The DAR also refers to work by DeMars et al. (2020), who used collared data from over 300 boreal caribou females in the Northwest Territories to assess habitat selection during seven seasonal activity periods and on a year-round basis. Those seasonal activity periods describe habitat selection by caribou in late winter and calving, which reflect Environment Canada’s (2012) biophysical attributes of critical habitat.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer’s response</p>	<p>potential disturbance to biophysical habitat selected during critical life stages of late winter and calving.</p> <p>B. Please provide versions of Figure 10.2 that illustrate</p> <ul style="list-style-type: none"> i. all-year, ii. calving/post-calving, and iii. late winter habitat selection using two visually contrasting categories (i.e., selected bins > 6; and least selected bins < 5). 	
61	<p>Caribou and moose: Movement, habitat, methodology: Risk - characterization of adverse residual effects (DAR Section</p>	<p>The DAR provides the following definitions for ‘likelihood’ and ‘magnitude,’ but it is unclear how these are applied in the characterization of adverse residual effects.</p> <p>a) Likelihood – the probability that the residual effect will occur is described as certain, possible or unlikely</p> <ul style="list-style-type: none"> - Unlikely: The residual effect is almost certainly not to occur. - Possible: The residual effect could occur. - Certain: The residual effect will certainly occur. 	<p>A. What are the qualitative or quantitative differences in probability rankings of certain, possible, and likely (see examples below)? What</p>	<p>Please see the attached document.</p>

<p>4.5.4, Table 10.3)</p>	<p>b) Magnitude – the amount of change in a measurable parameter or variable relative to existing conditions, defined for each VC as low, moderate, high, or other qualifier as deemed appropriate</p> <p>These categories for likelihood are problematic. For example, effects that are unlikely or certain are, logically, also possible. It would be more useful to know what effects are likely (that is, with a >50% probability of occurrence).</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer’s response</p>	<p>percentage probability does each of these likelihoods refer to? For example:</p> <ul style="list-style-type: none"> • does “certain” mean over 90% probability? Over 95%? • does “possible” mean less than 90 to more than 10% probability? • does “unlikely” mean less than 10% probability? Less than 5%? <p>B. In Table 10.16, the likelihood of residual effects on movement, mortality risk, and health of caribou and moose in the Local Assessment Area are all characterized as “possible.”</p> <ul style="list-style-type: none"> • Does the characterization of a “possible” 	
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			<p>likelihood have any meaningful influence on the assessment?</p> <ul style="list-style-type: none"> • Are likelihoods applied to estimate the overall risk of a residual effect to boreal caribou and moose? 	
62	<p>Caribou and moose: Significant adverse impacts to caribou habitat (DAR Section 10.0 and Table 10.7)</p>	<p>It is unusual for a developer of a project to present findings that its project will have significant adverse impacts to a valued component without proposing creative ways of reducing the level of impact so that, in its view, the adverse impact would no longer be significant.</p> <p>In the DAR, GNWT predicts that residual effects to caribou habitat will further contribute to the exceedance of a conservation-based threshold. These effects are predicted to be significant. However, apart from standard mitigations presented in Table 10.7, GNWT does not propose additional actions in the mitigation hierarchy to reduce these adverse impacts to the level where they would no longer be significant.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>Please provide additional mitigation suggestions beyond those already described that may reduce adverse impacts of the project to boreal caribou habitat so that, in GNWT's opinion, the impacts would no longer be significant.</p>	<p>Please see the attached document.</p>
63	<p>Caribou and moose: Mitigation and offsetting impacts to caribou habitat (DAR sections</p>	<p>The DAR predicts significant adverse impacts from the Mackenzie Valley Highway project to boreal caribou habitat but does not propose an approach to mitigating those impacts. Offsetting is the final step in the mitigation hierarchy. However, offsetting or any other mitigation alternative is not proposed in the DAR, despite a finding of significant impacts to caribou habitat. The Board notes that in 10.8.1, the developer will "evaluate the approach to</p>	<p>A. Are there specific additional mitigations to mitigate significant adverse impacts</p>	<p>Please see the attached document.</p>

<p>10.4.2.2, 10.8.1)</p>	<p>offsetting proposed for the Tłıchq Highway (GNWT 2021c) and will seek input on offsetting options for the Project during and following the environmental assessment”. However, no specific offsets are proposed.</p> <p>The GNWT’s Final Wording for Measures (PR#180) for the Review Board’s Report of Environmental Assessment of the Tłıchq All-season Road required offsetting to mitigate significant impacts to caribou habitat. Specifically, measure 6-3 required a Habitat Offset and Restoration Plan. To meet this requirement, the developer (GNWT) prepared the Tłıchq All-Season Road Final Boreal Caribou Habitat Offset Plan (PR#171).</p> <p>The GNWT’s 2022 Annual Measures Report (PR#367 for EA1617-01) describes how each measure from the Report of Environmental Assessment of the Tłıchq All-season Road is being implemented. In the 2022 Annual Measures Report, implementation of measure 6-3 states that:</p> <p>“Funding has now been secured for the next steps as follows: 1. Development of Implementation Plan 2. Field Implementation of the Plan A Request for Proposals is currently being prepared for the development of an Implementation Plan in 2024.”</p> <p>MVRB information request #3, Lessons Learned: Tłıchq Highway, was issued to GNWT on March 15, 2024. However, in its response, GNWT did not describe any progress on the implementation of measure 6-3, the Caribou Habitat Offset Plan, or any lessons learned regarding offsetting impacts to caribou habitat from the Tłıchq Highway. GNWT’s response to information request #3 on page 7 states that a report on programs under the Wildlife Management and Monitoring Plan will be completed in the fall of 2024, but it is not clear if this would include an assessment of implementation of caribou habitat offsetting.</p>	<p>on caribou habitat that could be effective prior to considering offsetting as the final step in the mitigation hierarchy? Suggest additional mitigation that could be successful.</p> <p>B. Please explain why specific offsetting actions have not been proposed as a mitigation for the identified significant adverse impacts to caribou habitat. Suggest specific offsetting actions that could be successful to mitigate significant adverse impacts to caribou habitat.</p>	
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		<p>Section 10.4.2.2 of the DAR references that GNWT-ECC is interested in developing guidance documents concerning offsetting for biodiversity.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>C. Describe any offsetting actions, lessons learned, challenges, opportunities, and results of offsetting significant impacts to caribou habitat for the Tłıchǫ Highway.</p> <p>D. Would implementation of any offsetting actions as mitigation for the Mackenzie Valley Highway change the developer's prediction of significant adverse impacts to caribou habitat?</p> <p>E. How would offsetting for biodiversity differ from offsetting specifically for</p>	
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64	Caribou and moose: Impacts and monitoring with optimal construction schedule (DAR section DAR Section 5.4.1, RB ORS overarching IR 1)	<p>The GNWT response to MVRB IR#1 (June 19) describes an optimal construction schedule of three to four years (subject to assumptions including financing and timing of project authorizations). This construction schedule could have different impact pathways, mitigations and monitoring options to caribou and moose compared with the conceptual schedule of twenty years described in the DAR.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	boreal caribou? How would a shorter project timeline change impact predictions on caribou and moose? How would the optimal construction timeline change the mitigation and monitoring of caribou and moose?	<p>The 'optimal timeline' of 3-4 years referenced in the Government of the Northwest Territories (GNWT)'s response to MVEIRB Information Request (IR)#1 does not replace the GNWT's Project and project construction schedule of 10 years of construction over a 20-year period, as described in the Developer's Assessment Report (DAR). Rather, the GNWT considers the 3–4-year construction timeline an alternative method to construction.</p> <p>The GNWT has included with its submission a supplemental filing which provides a qualitative evaluation of the accelerated construction timeline (GNWT, 2024). Specifically, Section 3.2.7.8 provides a relative comparison of residual effects on caribou and moose from changes in habitat, movement, mortality risk and health between the Project construction approach as assessed in the DAR, and the accelerated construction alternative. The comparison is applied to the construction phase only. As noted in Section 3.2.7, comparing the accelerated construction alternative to the Project construction approach is based on applying the same mitigation measures to the same potential effects as assessed in the DAR.</p> <p>The response to this IR has been prepared in accordance with the GNWT's Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p>
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				<ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
65	<p>Wildlife: Effectiveness of Plans and Adaptive management (RB ORS overarching IR 2)</p>	<p>The developer, in its response to IR#2, has provided ample evidence that future conditions will change considerably from historic conditions used for the baseline in the DAR. Despite this, the developer concludes that “current conditions are adequate to predict project effects, proposed management plans are likely to be effective, and conclusions can be relied upon” (p2 of GNWT response to IR#2).</p> <p>The Review Board remains concerned about how predictions made with historical environmental conditions that will change significantly over the life of the project can lead to reliable impact predictions. Realistic and reasonable predictions are needed to identify and develop appropriate mitigation.</p> <p>The developer has proposed adaptive management of the effects of the highway. The developer states: “Where a variance between the actual and predicted effects occur, a determination is made as to whether modifications or other actions are necessary to revise the existing mitigation measures.” (DAR Vol 4, sect 23.2, p23-3). The above statement speaks to comparing predicted and observed effects. The starting point for this comparison is having reliable predictions.</p> <p>In addition, the Review Board is concerned that, based on the evidence provided by the developer, both predicted and observed effects may be difficult to determine. For predicted effects, the certainty of large-scale change to future conditions leads to concern about whether these predictions are accurate. With respect to observing actual effects, it is uncertain how monitoring can determine if observed changes to a VC are caused by the highway or by other factors such as climate change, hunting and harvesting, or some combination of cumulative effects. This will make it difficult to determine how to best mitigate those impacts.</p>	<p>A. Please clarify how the effectiveness of management plans (WMMP or adaptive management plans) will be measured.</p> <p>B. Please describe how the GNWT will attempt to identify the source (effects of the highway, or climate change-related effects, or hunting or harvesting, or future developments, or a combination of cumulative effects) of future changes to caribou and moose abundance, mortality, movement and distribution that</p>	<p>Please see the attached document.</p>

		<p>Further, adaptive management requires monitoring to compare results against benchmarks, goals, or predictions (DAR volume 4, section 23.2, p 23-3). The Board is unaware of the developer providing benchmarks or goals for boreal caribou or moose.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>may be identified by proposed monitoring?</p> <p>C. For the purposes of adaptive management, can the GNWT provide goals, benchmarks, thresholds, or action levels that would apply to moose or boreal caribou?</p> <p>D. If caribou or moose populations were observed to be adversely affected in the region of the MVH, can the developer provide examples of specific mitigations and management actions that could be implemented to counter these</p>	
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66	Route alternatives: Alternative means, road alignment proposed by Pehdzéh Kǰ First Nation (DAR section 5.2.3, table 5.2, section 7.2)	<p>Section 7.2.3.2 gives a very high-level overview in a comparative evaluation of alternatives, resulting in the preferred route over the inland route alternative.</p> <p>The Review Board needs to understand the full rationale for dismissing the alternative route alignment.</p> <p>Table 7.1 presents the criteria used to evaluate routes and includes technical, economic, and environmental criteria. The criteria in the table does not include social or cultural values or Traditional Knowledge. Table 5.2 describes an alignment recommendation from Pehdzéh Kǰ First Nation from approximately km 711-764. Comprehensive evaluation criteria for selecting a route must include social and cultural values of communities and Traditional Knowledge of Indigenous organizations near the route, not just technical, economic, and environmental criteria. The alignment recommendation from Pehdzéh Kǰ First Nation needs examination, particularly given the proponent's engagement challenges with the community of Wrigley.</p> <p>Throughout the DAR, the GNWT indicates that it is not willing to relocate existing bridges. The Review Board understands the reluctance of GNWT to relocate existing bridges, as described in section 5.2.3. However, this highway will be in place indefinitely. The best routing alternative should not necessarily be determined by historic placement of bridges with short to medium term lifespans and routing alignment originally chosen for use during the winter only. Reasons for not considering this request beyond the brief notes in table 5.2 are not described in the Developer's Assessment Report. The developer should also take into account ecological considerations now and in the future (for example, climate change refugia for caribou).</p>	effects? Please use a comprehensive alternatives analysis to describe the pros and cons of the inland alternative route (compared to the preferred route) in greater detail than in section 7.2, including: A. Add social/cultural and Traditional Knowledge criteria to table 7.1 by incorporating engagement from table 5.2, and any other engagement and Traditional Knowledge in the criteria used to evaluate the alternative route. Describe if the developer's preferred route	Please see the attached document.
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			<p>alternative changed based on the social/cultural and Traditional Knowledge criteria added to Table 7.1.</p> <p>B. Provide more details about why the developer will not consider moving bridges. Describe the pros and cons of moving bridges away from wet areas on the winter road alignment to the upland route.</p> <p>C. Describe how the developer has considered and assessed the alignment recommendation from km 711 to 764 proposed by Pehdzéh Kǰ First Nation. Summarize any ongoing</p>	
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			<p>discussions with Pehdzéh Kǰ First Nation on route alignment options near Wrigley and between Wrigley and the Blackwater River bridge.</p> <p>D. Please describe the extent that the existing winter road route selection reflected non-winter ecological considerations (such as flowing surface water; biodiversity of unfrozen wetlands in the spring, summer, and fall; or use of the area by wildlife outside of frozen conditions).</p> <p>E. Please provide an analysis of the potential for and the location</p>	
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			of future climate change refugia along the proposed highway Local Assessment Area.	
67	<p>Project description: Drone footage or video from a helicopter of route and ground-level photos during the open water season (DAR Chapter 5, Appendix 5A)</p>	<p>The Developer's Assessment Report is mostly text, with very few photos of the proposed highway route. Appendix 17A (Technical Data - Fish and Fish Habitat) has some good photos but does not show the complete route. Visual representation of the project route can help parties understand existing conditions.</p> <p>The map book in Appendix 5 gives an aerial plan view of the highway corridor. Low-level drone footage and a comprehensive ground-level photo map book of the route would help parties and the Board better understand existing ground conditions, water crossings, timber resources, wildlife habitat, and other values along the proposed route.</p> <p>A video of the Tłıchq highway route taken from a helicopter was made by the developer and shown to the Review Board and parties for the Tłıchq highway during the environmental assessment phase. This video helped all parties during that EA.</p>	<p>Please submit the following visual materials:</p> <ul style="list-style-type: none"> - drone footage or video from a helicopter of the entire route during the summer open water season. - summer ground-level photos at intervals where there is a change in topography or ground conditions to complement the plan view map book in Appendix 5A - ground-level and airborne photos of proposed quarry sites. 	<p>Please see the attached document.</p>
68	<p>Project description:</p>	<p>The project would greatly increase access to many communities along the route, but is also still time limited based on the essential</p>	<p>A. Describe whether there</p>	<p>A. The end-to-end use of the Mackenzie Valley Highway from Wrigley to Norman Wells will be subject to the crossing of the</p>

<p>Seasonality of road access (DAR section 5.2, 5.3)</p>	<p>links at ferry/ice road crossings (such as at Fort Simpson, Wrigley, and Bear River). There will be freeze up and thaw times when access will still be limited, and future climate change may still affect the timing, if it affects the ferry/ice road crossings.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response</p>	<p>are any concerns with water levels and access at these crossings, considering climate change.</p> <p>B. Please describe how the seasonal lack of access might affect impact predictions for communities.</p>	<p>Great Bear River. Currently, this is a winter road crossing. If the Great Bear River Bridge is constructed (a reasonably foreseeable project), this crossing will be open year-round. The connection of the Mackenzie Valley Highway to other Northwest Territories (NWT) Highways in the Dehcho Region (Highway #1, #7) and beyond will be subject to existing ferry and ice crossings at N'dulee and Fort Simpson, which are also not part of the Project. These crossings are not available when the ice crossing is being constructed, and during spring break-up. The timing and duration of these closures is dependent on annual environmental conditions, which may change over time. Current ferry operations are subject to water levels, as well as other operational considerations, and these factors will continue to influence ferry operations in the future, irrespective of the Project. It is predicted that water levels on the Mackenzie River will continue to fluctuate in response to climate change. The trajectory of change is not unidirectional; we expect to see water levels higher and lower than previous historic bounds.</p> <p>B. The Project does not propose to create continuous, year-round access to Tulita and Norman Wells, as access to these communities will be subject to temporary annual closures of the Highway #1 at ferry/ice crossings (Winter Roads Average Open/Close Dates Infrastructure (gov.nt.ca)). Those conditions are outside of the project description and operating conditions of the Project. These annual closures already affect access to Wrigley. These temporary road closures have been accounted for in the assessment of effects on communities.</p> <p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories (GNWT)'s Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments</p>
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				<p>has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
69	Road design: Low Volume Road Design and cumulative effects (DAR Chapter 26)	<p>The highway is designed as a Low-Volume Road for no more than 200 vehicles daily (pp. 26-8).</p> <p>If future conditions change (for example, due to increased development [as suggested in GNWT's answer to Review Board's comment #2], impossibility of travel by water or air due to climate change), road traffic might exceed 200 vehicles a day. In addition, the closure of Imperial Oil's Norman Wells operations or other industrial development in the region could lead to oversized traffic and heavy road loads. The road should be designed for its intended functions.</p>	<p>A. Please describe the consequences for highway maintenance and road safety of having more than 200 vehicles daily on the highway.</p> <p>B. Will the road be designed to support oversized or heavy traffic? For example, for the closure of Imperial Oil's Norman Wells Operations or for future mining or oil and gas development.</p>	<p>Please see the attached document.</p>
70	Permafrost: Failure mode	The Developer's Assessment Report lacks a failure mode analysis considering permafrost as a design feature in the roadbed	Will the developer	As noted in Section 14.4.1 of the Developer's Assessment Report, failure modes analyses have not yet been completed,

<p>analysis (DAR Chapter 14)</p>	<p>(mentioned on p.14-24), requested in the Terms of Reference (PR#66 - TOR, p.27). The failure mode analysis should consider how different parts of the project could fail under different initiating conditions (including low probability high consequence ones), root causes of failures (including cascading systemic failures), likelihoods, and what the resulting severity of consequences would be on the overall system (including on highway function and VCs). The failure mode is important for understanding and predicting maintenance costs and resourcing, particularly considering the potential for changes related to climate change over the operating life of the highway in a region with karst terrain.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>conduct a failure modes analysis based on additional geotechnical information once the routing alignment is known for both the construction and operations and maintenance phases? Will this be available for meaningful consideration in the EA?</p>	<p>and will not be completed and available for review during the environmental assessment, because the design does not yet incorporate site-specific geotechnical information. The geotechnical studies needed to obtain data about subsurface ground conditions to inform detailed design will be conducted once there is greater certainty of the alignment routing corridor (currently subject to the environmental assessment). However, the GNWT believes that the current basis of engineering road design is adequate for the current purposes of MVEIRB in satisfaction of the Terms of Reference, and that the GNWT's commitment for subsequent design and analysis, is appropriate and will adequately consider the range of geotechnical conditions to be potentially encountered along the highway route.</p> <p>Failure mode analysis will be conducted as part of the detailed design process, in specific areas where failure risk needs to be considered, such as locations where there is a high embankment, significant road cuts, and areas of anticipated thermal erosion (such as areas of overflow icing) where potential for failure is related to the presence and disturbance of ground ice. Potential failure modes to be analyzed may include (but are not limited to) differential thaw settlement, loss of soil strength, landslides, and localized slumping.</p> <p>Risks and risk analyses are typically evaluated in order of priority by: life safety considerations; minimizing environmental damage or disruption; construction cost; and, maintenance costs and maintainability.</p> <p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been</p>
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				<p>considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
71	<p>Water quantity: consideration of icing and overflow on culvert design; existing culverts (DAR Table 5.1 of section 15.1.2, Table 15.8 of section 15.4; s.15.4.2.2, s.15.7.1 and s.15.7.2)</p>	<p>Section 15.7.1. of the Developer's Assessment Report states that surface water quantity prediction confidence can rely on the effective implementation of design-based mitigations, which are: (a) "drainage culverts will be installed...in consideration of site-specific icing/glaciation effects" as described in Section 15.4.2.2; and (b) "major drainage have existing bridges and will not be altered or replaced" stated in Section 15.7.2.</p> <p>Existing information does not appear to support the developer's statement, because:</p> <ol style="list-style-type: none"> 1. There is a lack of information on naturally occurring icing and its effects. This can greatly affect the desired conveyance capacity of culverts. This is also identified as required information for design consideration in Table 5.1. 2. There is a lack of information on channel bed material and bank stability near crossings. Major drainage is not clearly defined in the project design, lumping all 85 proposed drainage structures, including bridge-culvert (sections 5.4.7.1), as minor drainages and neglecting that possible work identified in section 5.4.6.2 that "some work around existing bridges may be required to extend rip rap to accommodate the wider embankment approaches." <p>The Review Board has reviewed the Developer's responses to other parties' IRs posted on the ORS, which include relevant information on existing culverts (DFO-18, 21 and 29) and photos (DFO-27 and</p>	<p>A. Please describe the developer's plan to share culvert design information and update Table 5.2 to demonstrate how community concerns about icing and overflow (location and magnitude) are addressed in culvert design.</p> <p>B. Please describe what is considered to be a 'major' drainage. Is it based on either:</p> <ul style="list-style-type: none"> - design criteria (cross-sectional span of over 1.5 	<p>Please see the attached document.</p>

		<p>28), design of and mitigation at crossings (DFO-04 and 15, LKFN-31).</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>meters) or - watercourse width that the structure crosses (greater than 5m)?</p>	
72	<p>Water quantity: effects of the environment on the highway, climate change, project description (DAR Sections 5.2.2., 15.4 (Table 15.8), and 24.3 (Table 24.9); and, Section 4.2 of Appendix 15A)</p>	<p>Section 5.2.2 describes the hydro-technical criteria for drainage structure. It should "be designed for a 1:100-year flood event and the dike effect caused by the new road embankment". Section 4.2 of Appendix 15A describes the existing peak flow conditions are of 2-year and 100-year return periods. As the Dehcho region is becoming wetter and warmer, according to the participants from the Traditional Knowledge and Traditional Land and Resource Use Studies, mounting evidence of the warming climate in the North warrants flexible design changes. Culvert and bridge design consideration of storm events must meaningfully consider the effects of the warming climate, including changes in the intensity-duration-frequency of precipitation events.</p> <p>The Review Board has reviewed the Developer's responses to RB-02 and 24, and DFO-14, and provides the following comment:</p> <ul style="list-style-type: none"> • GNWT explained "design of crossings will eliminate other potential pathways, including changes to surface drainage patterns." The Review Board understands that crossing design should consider changes to streamflow due to the project (i.e., road embankment) and climate change. • GNWT explained culvert crossings, compared to bridges, is the preferred design choice based on road safety considerations. Resilience of the project in future climate scenarios was not discussed in this design choice. • GNWT clarified the future climate conditions in the climate resilience assessment. <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it</p>	<p>A. Please describe if the hydro-technical criteria for drainage structure will allow for change from existing conditions, considering the potential for more frequent or more severe flooding in the future due to climate change.</p> <p>B. What are the design criteria for projected peak flows under variable future climate scenarios?</p> <p>Please estimate the predicted frequency of a</p>	<p>Please see the attached document.</p>

		clear what information was provided by each department and how that information was used in the developer's response.	flood with what is currently a 100-year return period (of the same magnitude but may be more frequent in the future given climate change) over a range of periods (such as in 20, 50 and 80 years in the future), and describe the implications for project design.	
73	Water quantity: climate change, dust control and pollution from mitigation, water use (Sections 5.5.7 and 15.1.5; section 16.1.2; RB ORS comment 26)	<p>The magnitude of change is one criterion for determining residual effects on water quantity. The Northwest Territories has experienced dramatic swings in water levels in streams and lakes in recent years. Impacts from climate change could result in a greater extreme in the natural variation of water quantity.</p> <p>The Developer responded to community concerns about dust saying that only water will be used for dust control, and citing GNWT's 2013 Guideline for Dust Suppression (s.16.1.2). Table 5.11 estimated daily water use of 100 cubic meters for dust control during operations and maintenance. For the Tłjchq Highway dusting was identified by communities as a major concern. Water use estimated for dust control to mitigate dusting impacts can potentially be greater than anticipated.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	A. Is there a contingency if actual water required for dust suppression is greater than the anticipated amount? How will the potential for increased water withdrawals be addressed? What were the lessons learned from the Tłjchq Highway on the amount of dust suppression	Please see the attached document.

		<p>The Review Board has reviewed the developer's response to RB-26.</p>	<p>required due to complaints from highway users about extreme dust conditions?</p> <p>B. Please describe what other dust suppressants are being considered besides what is prescribed in the GNWT 2013 Guideline (water, calcium chloride, DL-10). Please include:</p> <ul style="list-style-type: none">- any standard mitigation when using these prescribed suppressants (like proximity to water or wind direction)?- if using newer dust suppressants not in the guideline, the fate of substances in the environment and any pathways of effects on the	
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			environment.	
74	Water quality: Water quality and quantity, draft Water Monitoring Plan (DAR Chapter 15 and 16; Sections 23.5.5 and 23.5.6 of Volume 4)	<p>The DAR lacks information on how water quality monitoring will be designed to evaluate the effectiveness of mitigation. Sections 23.5.5 and 23.5.6 of the report provided objectives for water quantity and quality monitoring but there is no plan or framework currently being proposed. Submission of a draft Water Monitoring Plan during the EA will help parties and the Board understand the monitoring and mitigation of project impacts on both water quality (sedimentation) and quantity (in situ measurements at water withdrawal locations).</p> <p>The Water Monitoring Plan for the Tłı̨chǫ highway included details on instream construction monitoring (total dissolved solids, turbidity, dissolved oxygen), water withdrawal monitoring, water withdrawal sources with location maps, wastewater monitoring, training for employees, and reporting requirements.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p> <p>The Review Board has reviewed the developer's responses to DFO-10, 22 and 23, ECC-16, and LKFN-16, 21 and 28, and RB-25.</p>	Please submit a draft Water Monitoring Plan for the Mackenzie Valley Highway, with similar contents and format to the one prepared for the Tłı̨chǫ highway. Include Traditional Knowledge of water sources chosen for water withdrawal and community participation in field data collection in the Plan.	<p>Please see the draft Water Monitoring Plan in Attachment 1, which incorporates water use and water quality monitoring previously included in the draft Erosion Sedimentation Control Plan, and summarized in Table 23.1 of the Developer's Assessment Report. The Government of Northwest Territories (GNWT) notes that such duplication will be addressed as the draft plans are finalized during licencing by removing duplicated monitoring requirements from one or the other plan, as may be appropriate.</p> <p>The response to this Information Request has been prepared in accordance with the GNWT's Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p> <p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
75	Fish, water: Mitigation, Cumulative Effects Assessment (DAR Sections 15.1.2 and 15.2.2, and 15.5.4.3; Figure 1.2 of Appendix 15C;	<p>Both Canyon Creek and Prohibition Creek are identified in Appendix 15D as water sources for Prohibition Creek Access Road (PCAR) and potential source in Appendix 15C for this proposed highway alignment. These two creeks have the largest watershed area among the potential water sources for this highway's segment north of Tulita, and are used for PCAR watering. Norman Wells Renewable Resource Council Traditional Land and Resource Use participants expressed concerns about lowered water levels in these two creeks (Table 15.1).</p> <p>Both Creeks are important fishing sites and fish spawning ground in</p>	A. Will the developer withdraw water from Canyon and Prohibition Creeks along the proposed Prohibition Creek Access Road alignment?	Please see the attached document.

<p>Sections 1 and 6 of Appendix 15D; Sections 17.2.2, 17.5.2 and 17.6.2; S.6.1 of Appendix 15D)</p>	<p>the Sahtú, specifically whitefish (important harvest species for Sahtú communities) only frequents Prohibition Creek (s.17.2.2). However, section 17.6.2 states that “cumulative changes to fish habitat from projects that include water withdrawal are not considered, since the Projects’ contribution is considered negligible” and references s.17.5.2. Section 17.5.2, however, only discusses effects on fish health due to fishing pressure not water withdrawal. If winter withdrawal is to take place in these creeks, it may pose heightened risks (lower dissolved oxygen level) to fish overwintering (s.6.1 of Appendix 15D).</p> <p>Reasonably foreseeable project activities do not include the progressive reclamation and closure of the Imperial Oil Norman Wells Operations. Please provide rationale. Hauling and water withdrawal from Imperial Norman Wells Operations will interact cumulatively with effects of the highway, including impacts to water quantity.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer’s response.</p> <p>The Review Board has reviewed the developer’s responses to DFO-10, 13, 11, 12, and 22, RB-25, and LKFN-30.</p>	<p>B. If not, what are the alternatives?</p> <p>C. If water withdrawals will occur in these watercourses, how are community concerns addressed in the Cumulative Effects Assessment regarding existing and future water use? This answer should consider impacts of lowered water level on culturally important fishing sites and fish species, and of fish overwintering if winter withdrawal takes place. Include Dissolved Oxygen as a parameter in water</p>	
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			<p>monitoring.</p> <p>D. What are the specific measures for sensitive species, like the arctic grayling?</p>	
76	<p>Vegetation: Vegetation, merchantable timber, use by communities (DAR sections 18.2.2.2, 18.4.3.3)</p>	<p>Section 18.2.2.2 states that merchantable timber is expected to be around 65% of the total timber volume. Table 11.23 presents recommended mitigations from Indigenous Governments and organizations. The recommendation is that people want to use any cleared wood or timber and create employment opportunities related to wood harvesting.</p> <p>The developer states, "In locations where sufficient quantities of merchantable timber are present, the trees will be limbed and decked in a dry area and made available to a receiver." However, "If after five years post-harvest the trees have not been removed, they will be burned, chipped, or disposed of by another authorized method".</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>Please describe any options the developer has considered for the community to benefit from wood clearing, including the use of the wood, jobs clearing and harvesting wood.</p>	<p>The Government of Northwest Territories (GNWT) has proposed to limb and deck merchantable timber (>14 centimetres [cm] diameter at breast height) cut for the Project and make it available to anyone holding a timber cutting permit, or a timber cutting licence from the GNWT. A timber cutting permit would allow harvest (in this case collection) of up to 5,000 cubic metres (m3) of cut timber, for up to one year. A timber cutting licence would allow harvest of more than 5,000 m3, for up to five years. There is no restriction on who may apply for a permit or licence. Non-merchantable trees are proposed to be limbed and stacked for community salvage, where possible. The GNWT's proposed approach to timber collection and salvage provides opportunities for local communities to benefit from wood clearing. Clearing will be part of the scope of the GNWT's contracted services for the Project.</p> <p>The response to this Information Request has been prepared in accordance with the Government of the Northwest Territories' Whole of Government Approach to the Mackenzie Valley Highway Environmental Assessment. Subject matter expertise from all relevant line departments has been considered in the drafting, review, and approval of this response. The GNWT is confident that all line departments are contributing to efforts to minimize negative social, cultural, and environmental impacts, while maximizing benefits for NWT residents from this project.</p>

				<p>The following departments have been specifically involved in the drafting, review and approval of this response:</p> <ul style="list-style-type: none"> • Department of Infrastructure • Department of Environment and Climate Change
77	<p>Vegetation: Vegetation, Invasive species - lessons learned from Inuvik-Tuktoyaktuk highway and the Tłıchq highway, and effectiveness of mitigation (DAR Section 18.4, table 18.8 on p18-29; Vol 1, section 18.4.2.2)</p>	<p>The Review Board acknowledges GNWT's response to LKFN#12 on the subject of invasive plant species management, including mitigation techniques. The GNWT has recent experience with invasive species management on both the Inuvik-Tuktoyaktuk Highway and the Tłıchq Highway. It would be helpful to understand what was learned and if it can be applied to the Mackenzie Valley Highway project.</p> <p>In responding to this IR, the Review Board requires analysis from ECC and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p>	<p>A. Please describe past experiences with invasive species migration and mitigation along the Inuvik-Tuktoyaktuk Highway and Tłıchq Highway after construction.</p> <ul style="list-style-type: none"> - Were predictions in the EA of invasive species spread accurate? - Was the implementation of mitigation successful? What worked and what did not? <p>B. Please describe any lessons learned on mitigating invasive species migration on those new</p>	<p>Please see the attached document.</p>

			highways and how these could be applied to the Mackenzie Valley Highway to minimize the migration and impact of invasive species.	
78	Accidents and malfunctions: Communication (DAR Chapter 25)	<p>Residents have expressed concern about emergency responses services and access to those services on the highway due to limited cell phone coverage (p25-4). Some suggested mitigation included satellite phones or cell phone infrastructure along the project corridor (P.9-174).</p> <p>Łíídlı́ Kúé First Nation asked about emergency responses during the operation phase on the ORS (LKFN #25), to which the developer responded that those concerns would be addressed in the Road Safety Plan and the Safety and Security Plan for Vulnerable Community Members. These plans are to be “developed and implemented in collaboration with communities through a Road Safety and Security Sub-Working Group” (GNWT's answer to LKFN #25). There is some information related to these plans in Chapter 9 (p.9-286-287), but details of these plans are not yet available.</p> <p>Likewise, there is no information regarding the emergency response procedures and protocols for communications that should be in place to provide a timely and effective response to fires, as mentioned in Section 25.8.2, p. 25-7.</p> <p>Additionally, the DAR does not provide the Traffic Management Plan’s framework.</p> <p>In responding to this IR, the Review Board requires analysis from MACA and any other relevant expert departments. Please make it</p>	<p>A. Please provide extra information on the Road Safety Plan, the Safety and Security Plan for Vulnerable Community Members, and the Traffic Management Plans, including more details such as an outline or summary of components.</p> <p>B. Please describe any access to and communication with emergency response services on the highway during</p>	Please see the attached document.

		clear what information was provided by each department and how that information was used in the developer's response.	<p>operations. Confirm whether 'new' cell coverage is considered part of emergency response. Mention whether there will be regular emergency shelters, pull outs, and outhouses along the highway. Include how emergency responses during fires will be addressed in the Road Safety Plan.</p> <p>C. When will the full versions of these plans will be available in draft and final form, in relation to the start of construction and operations?</p>	
79	Accidents and malfunctions: Fire ignition along roads	In study of sources of fire ignition in the US titled "Location, Timing and Extent of Wildfire Vary by Cause of Ignition", authors Syphard and Keeley found that fires are more likely to start along roadways, stating "[t]he effect of roads on ignition probabilities for arson- and	A. Please describe how the frequency of wildfire ignition	Please see the attached documents.

	(DAR Chapter 25)	<p>vehicle-caused fires is apparent through the linear features crossing the landscape". The same study noted that equipment-caused fires are also more common close to roads.</p> <p>The Review Board notes GNWT's response to LKFN #7 re: increased probability of human caused wildfires. The Review Board notes that the proponent's analysis excluded the southern parts of the Dempster Highway. The Review Board does not agree with the rationale for this exclusion.</p> <p>In responding to this IR, the Review Board requires analysis from ECC, MACA, and any other relevant expert departments. Please make it clear what information was provided by each department and how that information was used in the developer's response.</p> <p>Reference: Syphard, A. and Keeley, J. 2015. Location, timing and extent of wildfire vary by cause of ignition. International Journal of Wildland Fire. http://dx.doi.org/10.1071/WF14024</p>	<p>may be affected by the highway construction, operation and increased access, and describe how this affects other related impact predictions and mitigations for other VCs.</p> <p>B. Please update the analysis of your response to LKFN #7 to include the southern portions of the Dempster Highway to give a complete picture of human caused fire frequency for the entire Dempster Highway.</p>	
80	Socio-economic: Lessons Learned by RCMP	<p>Many of the concerns from community members regarding social impacts of the MVH are similar to the impacts that were predicted and experienced from TASR. In particular, people are very concerned about drugs and alcohol in their communities.</p> <p>In responding to this IR, the Review Board requires analysis from the RCMP and any other relevant expert departments or agencies.</p>	Please provide any lessons learned for the Review Board to consider, based on experience with the	Please see the attached document.

		<p>Please engage with the federal government in responding to this question. Please make it clear what information was provided by each group and how that information was used in the developer's response.</p>	<p>construction and operation of the Tłıchq Highway and the resulting social and policing issues in Whatı or elsewhere.</p>	
81	<p>Socio-economic: Mitigation options for drugs and alcohol</p>	<p>The RCMP works in many communities across the North and has likely tried different methods of managing impacts from drugs and alcohol, sometimes guided by RCMP policy and other times by things like municipal bylaws.</p> <p>In a recent letter to the Yellowknife superintendent, the Minister of Justice (attached) identified four priorities, including targeting enforcement responses to reduce illegal drugs and alcohol as the number one priority. The Review Board is interested in details of how the RCMP plans to work towards this priority, or examples from other Canadian jurisdictions (for example, where policing of bootlegging is made more efficient by enabling search of vehicles based on the standard of "reasonable suspicion").</p> <p>In responding to this IR, the Review Board requires analysis from the RCMP and any other relevant expert departments or agencies. Please engage with the federal government in responding to this question. Please make it clear what information was provided by each group and how that information was used in the developer's response.</p>	<p>A. Which social impacts (such as accidents, domestic violence) in communities are related to alcohol use?</p> <p>B. Which social impacts in communities are most related to drug use?</p> <p>C. Please summarize different techniques, approaches, and tools used to manage illegal or prohibited alcohol and drugs in communities it works in, including their</p>	<p>Please see the attached document.</p>

			relative effectiveness? D. Please describe approaches used elsewhere in Canada to facilitate policing of bootlegging in small primarily Indigenous communities.	
82	Fish: Overfishing pressures (DAR sections 17.6, 17.7)	<p>Some sections of the DAR predict that increased recreational fishing is not expected to be an issue for fish populations (see below). However, other sections say it is potentially significant (p.17-41).</p> <p>The DAR states, "Recreational fishing likely occurs primarily in the Mackenzie River (Deh Cho) or larger systems along the project alignment, such as the Blackwater River. Most watercourses along the project alignment are too small to provide fishing opportunities" (p.17-19). The DAR adds that "potential increased fishing pressure on the Mackenzie River (Deh Cho) and lakes within the RAA is not anticipated to affect fish populations in these waterbodies." (p.17-28). Mitigations are mentioned on p.17-22.</p> <p>The DAR also states, "In conclusion, a significant effect would only be for the change in fish population health if overfishing were to occur during construction and operations and maintenance of the Project" (p.17-41).</p> <p>Management strategies are mentioned as potential mitigation measures (p.17-42) but are not detailed in chapter 17. The Draft Fish and Fish Habitat Protection Plan (volume 5) does not consider overfishing as a potential effect in the mitigation</p>	<p>A. What are your estimations regarding the potential increase in recreational (non-Indigenous) fishing?</p> <p>B. Which waterbodies are most at risk of impacts from fishing?</p> <p>C. What design measures and management strategies are recommended to limit cumulative impacts on fish</p>	<p>A. DFO is not in a position to provide estimates regarding the potential increase in recreational fishing. It is the developer's responsibility to collect the data that will allow making those estimations.</p> <p>DFO suggest the developer determine whether there was an increase in recreational fishing along the Tłı̄chǫ and Inuvik to Tuktoyaktok Highways following construction. Additionally, to help estimate visitor projections, DFO recommends the developer conduct surveys in nearby communities/cities and among fishing groups to gauge interest in visiting and fishing in the newly accessible fishing areas. Finally, it would be beneficial to know if local tourism operators will be promoting the new road (e.g., for fishing the Mackenzie River or Great Bear Lake).</p> <p>B. Fishing may increase in waterbodies that are accessible and with known Arctic Grayling and Bull Trout populations. If these waterbodies support spawning grounds or overwintering areas, they would be vulnerable to overfishing and habitat disturbances.</p> <p>As per the DAR, Four Mile Creek, Twelve Mile Creek,</p>

		<p>measures tables (tables 2.1 to 2.6, p.7-15).</p>	<p>from overfishing in the long term?</p>	<p>Prohibition Creek, Great Bear River, Hodgson Creek, Ochre River, Whitesand Creek, Big and Small Strawberry Creeks, Vermillion Creek, Bob's Canyon Creek, Dam Creek, and 30 other watercourses may fall within this category.</p> <p>The Mackenzie River supports diverse fish populations and serves as a migration route for several species; however, minimal impact is expected to the fishery along the route, based on scale, access and remoteness of the drainage.</p> <p>C. Design measures and management strategies used to limit cumulative impacts on fish from overfishing include:</p> <ul style="list-style-type: none"> - limiting accessibility: building approaches to crossings in a way to limit access to the water (e.g., steeper grades, no large road pullout or parking areas, maintaining vegetation buffer zones, installing barriers) - placing signage: displaying signage at both ends of the highway and at the high-risk crossings with information about fishing regulations and restrictions - communication and outreach: working with impacted communities to raise awareness on the importance of protecting sensitive fish and fish habitat; providing information on conservation measures and restrictions (e.g., posting pamphlets, social media, posters in the community hall) - developing a Fisheries Management Plan with impacted communities to: <ul style="list-style-type: none"> - identify areas of concerns - identify conservation objectives - establish conservation measures for the identified areas of concerns (e.g., only allow catch and release fishing practices, establish fishing quotas)
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				<ul style="list-style-type: none"> - identify gaps in knowledge where further research/data collection is needed - monitor potential increases in recreational fishing (e.g., angler survey program) and the effectiveness of the conservation measures - use monitoring data to adapt the Fisheries Management Plan to conservation objectives - communicate and educate fishers. <p>Please note that sport fishing in the Sahtu Settlement Area may be subject to terms and conditions in accordance with the Sahtu Dene and Metis Comprehensive Land Agreement and the Northwest Territories Fishing Regulations.</p>
83	<p>Culture, Traditional Land Use, and Harvesting: Important Bird Areas in the Dehcho (DAR section 11.2.3.5.2)</p>	<p>The Review Board acknowledges the developer's response to LKFN IR#13 about nesting sites of peregrine falcons. However, according to the Developer's Assessment Report, "The SLUP [Sahtu Land Use Plan] (2013) acknowledges three Important Bird Areas (IBAs) identified by the Canadian Wildlife Service within the Sahtu Region, which represent important breeding habitats for several migratory species (SLUPB, 2023)" (p.11-43).</p> <p>The Developer's Assessment Report does not provide information regarding Important Bird Areas in the Dehcho region.</p> <p>The Review Board is looking for a response from the ECCC-CWS.</p>	<p>Please describe any Important Bird Areas or other habitat of importance for the Mackenzie Valley Highway identified by the Canadian Wildlife Service in the Dehcho region.</p>	<p>The Important Bird Areas (IBAs) identified by the Canadian Wildlife Service (CWS) within the Dehcho Region are:</p> <ul style="list-style-type: none"> - NT083: Mills Lake IBA; and - NT084: Beaver Lake IBA. <p>Mills Lake IBA (IBA Site Listing (ibacanada.com)): 61.462° N 118.235° W Mills Lake is formed by a widening of the upper Mackenzie River and is found at a point where the Horn River joins the Mackenzie River. The marsh and sedge shallow-water zones of Mills Lake attract thousands of migrating waterfowl during fall migration in September and October. The northern and eastern shoreline, and delta areas are most favoured. Habitat(s) include rivers/streams, freshwater lake, freshwater marsh, and mud or sand flats (freshwater). Further information on this important site is also available in "Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut" (NT Site 18).</p> <p>Beaver Lake IBA (IBA Site Listing (ibacanada.com)): 61.126° N</p>

				<p>116.949° W</p> <p>Beaver Lake is the name for a wide part of the Mackenzie River where the river meets the western end of Great Slave Lake. Tundra Swans and several species of ducks use Beaver Lake as a stopover during both spring and fall migration. The most common species are Canvasback, American Wigeon, Mallards, and the scaup species. Habitat(s) include mixed woods (boreal/alpine), freshwater lake, and freshwater marsh. Further information on this important site is also available in "Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut" (NT Site 19).</p> <p>The Edézhíe National Wildlife Area, co-designated as a Dehcho Protected Area, borders the northern extent of Mills Lake IBA NT083 and extends northwest to Highway 1 at 123°4'47"W and 62°42'10"N. This protected area is home to many species, including important species at risk such as boreal caribou. There is no reference to this area in the Developers Assessment Report (DAR).</p> <p>What this means in regards to assessing effects of the proposed highway: The Dehcho IBAs and protected area are located near Highway 1 and Highway 3. These areas do not overlap with the proposed Mackenzie Valley Highway alignment itself but may be exposed to increased traffic on Highway 1 and Highway 3 during the construction and operation phases of the proposed alignment of the Mackenzie Valley Highway.</p> <p>References: IBA Canada. Important Bird and Biodiversity Areas in Canada. Accessed August 2024 from: ibacanada.com Latour, P.B., Leger, J., Hines, J.E., Mallory, M.L., Mulders, D.L., Gilchrist, H.G., Smith, P.A., Dickson, D.L. . 2008. Key migratory bird terrestrial habitat sites in the Northwest Territories and Nunavut. 3rd ed. Canadian Wildlife Service Occasional Paper</p>
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				<p>No. 114, Ottawa. (publications.gc.ca/pub?id=9.563039&sl=0)</p> <p>Note: hyperlinks can be accessed through the pdf submitted to the Review Board's Public Registry.</p>
84	<p>Caribou and Moose: Significance definition (DAR sections 10.1.6 and 10.4.1.1)</p>	<p>The methodology used for assessing impacts and determining the significance of the project on boreal caribou habitat references the ECCC 2020 document below.</p> <p>References: ECCC 2020 Amended Recovery Strategy for the Woodland Caribou (<i>Rangifer tarandus caribou</i>). Boreal Population in Canada, Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada., Ottawa. X111 +143pp</p> <p>The Review Board is looking for a response from the ECCC-CWS.</p>	<p>In the opinion of ECCC, has the 2020 Amended Recovery Strategy document and its methodology for assessing impacts and determining significance been correctly used and implemented in the Developer's Assessment Report? Please describe how and why ECCC reached its conclusion.</p>	<p>ECCC's Boreal Caribou 2020 Amended Recovery Strategy (the Recovery Strategy) does not provide methodology for assessing impacts and determining significance. The Developer's Assessment Report (DAR) provides its own definition in section 10.1.6 for determining significance.</p> <p>The Recovery Strategy provides guidance on threats to caribou, the impact of disturbance at the range level, the identification of critical habitat and biophysical attributes required by caribou to carry out life processes and the identification of activities likely to result in the destruction of critical habitat. Some aspects of the guidance in the Recovery Strategy have been effectively implemented by the developer, while others have not.</p> <p>Range Level Disturbance: Use of conservation-based threshold</p> <p>The Recovery Strategy identifies at least 65% undisturbed habitat in a range as the disturbance management threshold, which provides a measurable probability (60%) for a local population to be self-sustaining. This threshold is considered a minimum threshold because at 65% undisturbed habitat there remains a significant risk (40%) that a local population will not be self-sustaining. As the amount of disturbance in a range increases, the risk that a local population will not be self-sustaining also increases.</p> <p>The developer references the threshold as a distinct point but should recognize that it is a minimum threshold related to a measurable probability the population will not be self-</p>

			<p>sustaining. This is particularly important in the cumulative effects assessment, given the range is currently approaching the threshold (Note, different values are provided for the % disturbance throughout the document: e.g., 31% disturbed DAR Section 8.3.2 pp 8-14; 28% disturbed DAR Section 10.5.2.3.1.1 pp 10-96.) The most recent calculations from ECCC, based on 2020 land cover data (ECCC 2020b), is 30%.</p> <p>The developer calculates the disturbance threshold (65% undisturbed) at the scale of NT1 (Northwest Territories range). This is correct as it was determined for use at the scale of the range (ECCC 2020). In the DAR, the % disturbance threshold, and exceedance of it, is calculated and discussed within the Local Assessment Area (LAA); this is an incorrect usage of the disturbance threshold. The disturbance threshold results from modelling conducted at the range level at the national scale (Environment Canada 2011). Therefore, while the threshold is calculated correctly for the scale of the full range, it has been incorrectly calculated when applying it to the project assessment area; the disturbance threshold should be used within the context from which it was developed.</p> <p>Regional range plans developed by the Government of the Northwest Territories (GNWT) also include disturbance threshold targets for each region, which are a maximum disturbance of 30% for the Sahtu region and 40% for the Southern NT1 region. The % disturbance numbers provided in DAR Section 10.6.2.1 pp 10-106, and referenced to Table 10.18, do not match the numbers provided in Table 10.18. In the text, % disturbance in the Southern NT1 range planning region exceeds the disturbance threshold target of 40% (46.7%) (see GNWT 2019, A Framework for Boreal Caribou Range Planning), so the project further contributes to exceedance of this target. In Table 10.18, however, southern NT1 % disturbance is 39.25% before the project and 39.25%</p>
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			<p>after the project. This exceeds the ECCC threshold of 35% disturbance, however the regional land use plan sets a threshold target of 40% disturbance for this region (balanced with a lower threshold in the Sahtu region). The error in these numbers changes the interpretation of the effect of the project. ECCC cannot appropriately interpret project effects until the errors are clarified.</p> <p>The developer does not estimate the total % disturbance of the range or regional planning areas resulting from all reasonably foreseeable future projects. All existing projects and reasonably foreseeable future projects in NT1, Sahtu Region, and Southern NT1 region should be included in the cumulative effects assessment.</p> <p>Section 7.2.3 in the Recovery Strategy (ECCC 2020) states, "The cumulative effects assessment will ... Assess the impact of all disturbances (anthropogenic and natural) at the range-scale... [and] Account for planned disturbances..." and further states, "...that, for large continuous ranges, a different approach for assessing cumulative effects will be required than for smaller discrete ranges. Dividing the large areas into smaller management units will allow land managers to understand where the disturbance is occurring and avoid irreversible range retraction and a permanent break in range connectivity." This would support looking at cumulative effects in both Sahtu and southern NT1, as the proposed project overlaps with both, and these are the management areas that GNWT has already defined.</p> <p>Critical Habitat and Biophysical Attributes: Assessment of direct and indirect habitat loss</p> <p>To assess direct habitat loss, the developer calculated habitat that boreal caribou select, according to a Resource Selection Function (RSF) model, which will be directly disturbed in the</p>
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			<p>Project Disturbance Area (PDA). Caribou are a landscape scale species that require continuous tracts of undisturbed habitat. They occur in low densities throughout their distribution to reduce the risk of predation (Section 3.3.1 ECCC 2020). Connectivity within and between ranges is essential for boreal caribou persistence on the landscape (Section 3.3.2 ECCC 2020).</p> <p>While caribou may select (i.e., use more than available) specific types of habitats (represented in the DAR by landcover data), at the scale of the Project Development Area (PDA), all areas directly disturbed should be considered habitat loss, not only those land cover types selected in the RFA model as used more than available. The relative amounts of the selected/avoided habitat within the PDA area are informative (e.g., risks of impacts are higher if the habitat disturbed is all preferred). However, caribou may move through any of the habitat types present within their range, and thus, the loss of those areas, particularly as small patches interspersed with selected habitat types, can be expected to impact caribou.</p> <p>To assess indirect habitat loss, the developer applied a 500 m buffer to the PDA and calculated the full area of habitat types that boreal caribou select, according to an RSF model. The 500 m buffer is not appropriate for assessing project-specific impacts on boreal caribou. The 500 m buffer is based on model results specific to a range-level analysis of disturbance impacts on boreal caribou at the national scale (Environment Canada, 2020). Instead, for the reasons described above, the calculation would be more appropriate if it was to be applied to all areas within the zone expected to experience direct disturbance by the proposed development.</p> <p>Critical habitat (CH) is not assessed or discussed in the DAR. The requirements under the Species at Risk Act (SARA)</p>
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			<p>regarding critical habitat are identified in the Wildlife Management and Monitoring Plan (WMMP), but no direct assessment or discussion of critical habitat is provided. “Critical habitat is the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the Recovery Strategy or in an action plan for the species” (Section 7, pp34, ECCC 2020). The Species at Risk Act requires that critical habitat be protected. Based on the current amount of disturbance in NT1 (i.e., currently above the 65% undisturbed habitat threshold), and the fact that there is not a range plan for all parts of the range, critical habitat is all undisturbed habitat in the NT1 range. Assessing impacts and determining significance for the species should include explicit consideration of impacts to critical habitat and how to mitigate those impacts.</p> <p>References:</p> <p>ECCC 2020a. 2020 Amended Recovery Strategy for the Woodland Caribou (<i>Rangifer tarandus caribou</i>). Boreal Population in Canada, Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada., Ottawa. X111 +143pp</p> <p>ECCC 2020b. 2020 - Anthropogenic disturbance footprint within boreal caribou ranges across Canada - As interpreted from 2020 Landsat satellite imagery. Environment and Climate Change Canada. Accessed September 2024 from: 2020 - Anthropogenic disturbance footprint within boreal caribou ranges across Canada - As interpreted from 2020 Landsat satellite imagery - Open Government Portal</p> <p>GNWT 2019. A Framework for Boreal Caribou Range Planning Summary. Government of the Northwest Territories. August 2019. Accessed September 2024 from: summary_a_framework_for_boreal_caribou_range_planning_august_2019.pdf (cclmportal.ca)</p>
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85	Caribou and Moose: Zone of influence (DAR sections 10.1.6, 10.4.1.1)	<p>The GNWT response to LKF#10 clarifies that the buffer used for the zone of influence (anthropogenic disturbance + 500 m buffer) is based on the Environment Canada 2011 study below. The GNWT response also states that this approach is accepted by ECCC for management planning.</p> <p>Reference: Environment Canada. 2011. Scientific Assessment to Inform the Identification of Critical Habitat for Woodland Caribou (<i>Rangifer tarandus caribou</i>), Boreal Population, in Canada. 2011 Update. Canadian Wildlife Service, Ottawa, Ontario. 102 pp. (http://epe.lac-bac.gc.ca/100/200/301/environment_can/2011/scientific_assessment_inform-ef/CW66-296-2011-eng.pdf) The Review Board is looking for a response from the ECCC-CWS.</p>	<p>Would ECCC confirm whether the 500 m buffer approach described in the Environment Canada 2011 document is for management planning only or for individual project assessment? Is the Environment Canada 2011 document appropriate for assessing project-specific impacts on boreal caribou for the Mackenzie Valley Highway? Please explain why or why not.</p>	<p>The 500 m buffer is based on model results specific to a range-level analysis of disturbance impacts on boreal caribou at the national scale. It is not appropriate to use this buffer size in a different analytical context, i.e., for assigning a zone of influence for determining indirect habitat loss from a specific development on caribou habitat. The assessment of indirect habitat loss, specifically, requires a different approach.</p> <p>For assessment of indirect effects, the zone of influence (ZOI) for this proposed development should be used and should be based either off of strong evidence in existing literature or analyses conducted to assess the project.</p> <p>In section 10.4.2.3.1.3 of the DAR pp 10-51, the developer includes a literature summary of the expected zone of influence for the project that could be used to inform their analysis. Comparable disturbance metrics are provided in section 10.5.2.3.1 under cumulative effects.</p> <p>Following their literature review, the developer states (DAR pp 10-52): "Regardless of the variability in the ZOI studies discussed in Section 10.4.2.1, Environment Canada (EC 2011) found that a 500 m buffer applied to anthropogenic disturbances on boreal caribou best represented the combined effects of increased predation and avoidance on caribou population trends. In the interest of providing comparable disturbance metrics and measures to that used by the federal government and comparable assessments, a 500 m buffer was applied to the Project's PDA to measure indirect habitat disturbance on caribou."</p> <p>References</p>

				<p>Environment Canada. 2011. Scientific Assessment to Inform the Identification of Critical Habitat for Woodland Caribou (<i>Rangifer tarandus caribou</i>), Boreal Population, in Canada. 2011 Update. Canadian Wildlife Service, Ottawa, Ontario. 102 pp. (http://epe.lac-bac.gc.ca/100/200/301/environment_can/2011/scientific_assessment_inform-ef/CW66-296-2011-eng.pdf)</p> <p>ECCC 2020 Amended Recovery Strategy for the Woodland Caribou (<i>Rangifer tarandus caribou</i>). Boreal Population in Canada, Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada., Ottawa. X111 +143pp.</p> <p>Note: hyperlinks can be accessed through the pdf submitted to the Review Board's Public Registry.</p>
86	<p>Caribou and Moose: Conservation allowances (ECCC #21 to GNWT Feb 28-April 22 ORS review)</p>	<p>The developer provided a response to an ECCC question about the Operational Framework for Use of Conservation Allowances. The Review Board, the developer and parties could benefit from examples of when and how conservation allowances were recommended in other jurisdictions in Canada, their implementation, and whether objectives were achieved.</p> <p>Reference: 2012 Environment Canada Operational Framework for Use of Conservation Allowances</p> <p>The Review Board is looking for a response from the ECCC-CWS.</p>	<p>Provide examples of conservation allowances that were recommended by ECCC to mitigate or offset impacts to caribou in project assessment. Describe how these conservation allowances were implemented and any follow-up on the effectiveness or</p>	<p>Context: Offsetting Guiding principles</p> <p>Biodiversity offsets have long been used in Canada and internationally to achieve conservation objectives for wetlands, biodiversity, endangered species, and other valued ecosystem components. ECCC's current approach for biodiversity offsetting is found in its Operational Framework for Use of Conservation Allowances (hereafter the Framework) published in 2012. Biodiversity offsets are an integral part of the mitigation hierarchy, a widely accepted concept that began to be formally recognized and codified in the 1990s and that promotes project development designs with the least environmental effect. In that context, biodiversity offsets achieve measurable and demonstrable conservation outcomes resulting from actions designed to balance against the residual adverse effects of project developments after the implementation of avoidance, minimization and on-site restoration measures. Design elements found in section 6 of the Framework are based on international best practices and should be used as a starting</p>

			<p>challenges in meeting conservation allowance objectives.</p>	<p>point in the development of the offset plan.</p> <p>The offsetting should use scientifically defensible methods and techniques and include a rationale to explain the methods and techniques chosen. The project developer is responsible for preparing the offsetting plan. The implementation of the offset plan can be undertaken by a developer, a third party or the province/territory where the project is located, as long as expected outcomes are achieved.</p> <p>A combination of measures may be necessary in order to achieve equivalency between project effects and benefits to biodiversity. Below is the preferred sequence for offset types and some examples:</p> <p>Habitat “like for like”</p> <p>In order of priority, habitat restoration is preferred over enhancement and enhancement over creation and creation over securement. Typical measures proposed for caribou include habitat restoration of forest service roads/legacy linear features; and habitat securement through relinquishment of subsurface mineral tenures rights from the developer and surface protection from other users (e.g., forestry).</p> <p>Non-habitat-based population and management measures</p> <p>These include measures that help decrease mortality or measures to increase recruitment.</p> <p>Typical measures proposed for caribou include predator control and maternal penning.</p> <p>Complementary measures</p>
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			<p>E.g., Research to address knowledge or information gaps associated with the offset plan through scientific and Indigenous-based research and data collection; measures to support attainment of population and distribution objectives in applicable recovery or management documents.</p> <p>Aligning with the Boreal Caribou Recovery Strategy</p> <p>The 2020 Amended Recovery Strategy for boreal caribou indicates that the primary threat to most boreal caribou local populations is unnaturally high predation rates as a result of human-caused and natural habitat loss, degradation, and fragmentation. These habitat alterations support conditions that favor higher alternate prey densities (e.g., moose (<i>Alces alces</i>), deer (<i>Odocoileus spp.</i>)), resulting in increased predator populations (e.g., wolf (<i>Canis lupus</i>), bear (<i>Ursus spp.</i>)) that in turn increase the risk of predation to boreal caribou. This threat can be mitigated through coordinated land and/or resource planning, and habitat restoration and management, in conjunction with predator and alternate prey management where local population conditions warrant such action.</p> <p>Restoration effort is a key component of recovery planning for boreal caribou to achieve self-sustaining status. However, assessing the effectiveness of restoration activities is an ongoing process due to the time frames (excess of 50 to 100 years) needed to return the habitat to a state where boreal caribou can effectively use the habitat to carry out life processes. Undertaking actions to reclaim boreal caribou habitat through restoration efforts is usually the preferred approach that a developer can take to offset a project's residual adverse effects on caribou habitat.</p> <p>Examples</p> <p>ECCC has recommended offsets for the loss of caribou habitat</p>
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			<p>in many project assessment processes across Canada.</p> <p>The following examples result from extensive discussions and collaboration with developers, Indigenous groups, provincial authorities, and implicated decision-makers. A key lesson learned from these experiences with offsetting is that these discussions should occur as early as possible in the assessment process as there are many challenges to address. These challenges include determining risks to the Valued Component (VC), whether the effects can be offset, how much of an offset is required to achieve equivalency, finding key areas and offsetting options that can better benefit the VC and ensure long-term protection. The following outcomes represent working through the mitigation hierarchy, prioritizing avoidance of disturbance over minimizing adverse impact, followed by on-site restoration, and lastly, offsetting. The implementation of these offset examples is a requirement of the project's enforceable conditions and will need to be reported on by the developer to the responsible authorities. At this time, it is not possible to comment on the effectiveness of these project offsets, however, it is expected that follow-up requirements and adaptive management will help ensure these offset measures achieve the expected outcomes.</p> <p>NOVA Gas Project, AB</p> <p>The NOVA Gas Transmission Ltd. 2021 pipeline expansion crosses the Little Smoky boreal caribou range in Alberta. The project represented a loss of 116 ha of critical habitat. Given the risks for boreal caribou and the residual adverse effects on First Nation (FN) rights, the Governor in Council imposed a condition on the developer, to implement a habitat offset equivalent to a ratio of 30:1 (offset : impact). This represented an amount of on-the-ground offsetting of 3480 ha or equivalent financial contributions to habitat restoration</p>
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			<p>programs managed by the Government of Alberta within the Little Smoky caribou range. Consultation with the Province of Alberta was required since the majority of eligible restoration sites are located on Provincial Crown land. Conditions include monitoring and reporting mechanisms.</p> <p>Blackwater Gold Project, BC</p> <p>The Blackwater Gold mine in British Columbia was approved in 2019 and is located in the Tweedsmuir Southern Mountain Caribou local population unit. The project was estimated to destroy 248 ha of high-elevation critical habitat and 4468 ha of Type 1 Matrix critical habitat.</p> <p>Project conditions required the developer to create an offsetting plan for caribou to the satisfaction of Environment and Climate Change Canada. The draft BC habitat offset decision support tool (DST) was used to inform the offsetting outcome with ratios ranging from 6.2:1 to 9.8:1. Collaborative efforts between ECCC, British Columbia First Nations and the developer established the offsetting measures would be comprised mainly of habitat restoration and will include habitat protection and securement.</p> <p>The total number of hectares to be restored based on this plan came to 27, 077 ha, with a focus on industrial road sites. Another 11,059 ha of key critical habitat under threat has been secured for 50 years (surface and sub-surface).</p> <p>The implementation of the restoration will be led by First Nations as part of a broader restoration program in the herd range and funded by the project developer. Conditions include monitoring and reporting mechanisms.</p> <p>North Corridor Expansion, AB</p>
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			<p>The pipeline crosses 14.8 km of the Red Earth boreal caribou range and disturbs 20.09 ha of critical habitat, in Alberta. Additionally, the 10.85 ha compressor station expansion would disturb 6.1 ha of critical habitat in the Chinchaga range. Given the risks for boreal caribou (both ranges are not considered to be self-sustaining), and the residual adverse effects to First Nation rights, the Governor In Council imposed a condition to the developer, to implement a habitat offset equivalent to a ratio of 30:1 (offset : impact). This represents an on-the-ground measure of restoring 183 ha of disturbed habitat within the Chinchaga range and 603 hectares within Red Earth range, to an undisturbed condition. In total, the developer is required to restore 786 ha of caribou habitat offsite. These conditions require the developer to work with the province of Alberta to determine suitable offset locations outside of the project area. Conditions include monitoring and reporting mechanisms.</p> <p>Environment and Climate Change Canada provides guidance related to administering the federal Species at Risk Act (SARA) in regards to federally listed Species at Risk (SAR) and expertise related to boreal caribou. The developer may consider the guidance and expertise provided by ECCC when developing and implementing offsets and mitigations for project impacts to SAR and boreal caribou. The regulator in each case is responsible for performing any follow-up activities to determine if those offsets and mitigations proposed by the developer are effective in meeting objectives.</p> <p>References: Environment and Climate Change Canada. 2012. Operational Framework for Use of Conservation Allowances. Government of Canada Publications, Ottawa. https://publications.gc.ca.</p> <p>Note: hyperlinks can be accessed through the pdf submitted</p>
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87	<p>Caribou and moose: Species at risk and vehicle collisions (DAR sections 10.4.4, 19.4.4, ECCC letter to Review Board April 30, 2024)</p>	<p>Section 10.4.4 assesses the risk of direct mortality to boreal caribou and moose from vehicle collisions during the construction and operation of the Mackenzie Valley Highway. Boreal caribou are a species at risk.</p> <p>The ECCC letter to the Board dated April 30, 2024 (PR#204), describes the complete list of species at risk that may potentially be affected by the project. The Review Board has special responsibilities under the Species at Risk Act to protect species at risk.</p> <p>The Review Board is looking for a response from the ECCC-CWS.</p>	<p>Which species at risk are the most vulnerable to mortality from vehicle collisions?</p>	<p>ECCC is not an expert in vehicle collision mortality, particularly in the case of species at risk for which ECCC is not the day-to-day management authority. The 2020 Revised Recovery Strategy for Boreal Caribou notes that "In some areas, boreal caribou are vulnerable to mortality from vehicle or rail collisions (Brown and Hobson, 1998); however, on a national scale, vehicle collisions are not thought to pose a major threat to boreal caribou (Boreal Caribou ATK Reports, 2010-2011)." ECCC-CWS is not the day-to-day management authority for this species and does not have territorial specific information.</p> <p>Regarding migratory bird species at risk, many of which the department is responsible for day-to-day management, tracking vehicle collisions is challenging due to the lack of data. The primary factor contributing to this is the small physical size of many birds. This contributes to most bird-vehicle collisions going unreported. Difficulty detecting dead birds along roadsides and high scavenger rates make research in this area difficult. In the absence of information on these incidents, it remains a gap in understanding and ability to assess and mitigate impacts to these species from collisions with vehicles.</p> <p>Birds that fly and swoop low to catch prey, especially common nighthawks and short eared owls, are most vulnerable to collisions with vehicles. Gunson & Schueler (2019) report vehicle mortalities of common nighthawk (<i>Chordeiles minor</i>), barn swallow (<i>Hirundo rustica</i>), bank swallow (<i>Riparia riparia</i>), and short-eared owl (<i>Asio flammeus</i>) in Ontario. Note that Government of NWT is the day-to-day management authority for short-eared owls and may have additional information on this species.</p> <p>ECCC (2021) further specifies that low-flying and swooping owls are at higher risk for vehicle collisions near roads. The</p>

				<p>short-eared owl (<i>Asio flammeus</i>) is vulnerable because it tends to swoop low to hunt small mammals. The common nighthawk (<i>Chordeiles minor</i>) is additionally vulnerable because it tends to forage for insects, which are attracted to the warmth of road surfaces. Further, both species may hunt at night when visibility is poorer.</p> <p>References: ECCC 2020 Amended Recovery Strategy for the Woodland Caribou (<i>Rangifer tarandus caribou</i>). Boreal Population in Canada, Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada., Ottawa. X111 +143pp</p>
88	<p>Socio-economic: Nutrition North Subsidy (DAR chapter 9)</p>	<p>Tulita and Norman Wells are currently eligible for the Nutrition North Canada (NNC) subsidy and the Harvesters Support Grant. Wrigley and Fort Simpson are eligible for the NNC subsidy only during seasonal periods of isolation (spring and fall) and are not eligible for the Harvesters' Support Grant.</p> <p>In the Developer's Assessment Report (DAR), the GNWT stated that "the presence of an all-season road would likely eliminate the Nutrition North subsidy" (p.9-91). The GNWT added that "In Wrigley, the majority of households report being worried and being worried 'often' [about having enough money for food], which is a higher rate than is seen at the regional or territorial level. The rates in Tulita are lower than Wrigley and the regional rates, but still higher than the territory" (p.9-91).</p> <p>The DAR adds that "Wrigley shows comparable food price indices to the communities in the Sahtu Region that only have winter road access, even though it is connected to Hwy 1. It is unclear to what extent any difference in community food prices is due to communities being connected to an all-season road." (p.9-92). The DAR also voices that "Given all of this information, it is not anticipated that the food price indices for the LAA communities will show a clear decrease as a result of the Project, which in turn</p>	<p>How would the road change Tulita and Norman Wells' eligibility for the NNC subsidy, the Harvesters Support Grant, and any other related funds?</p>	<p>Should the Mackenzie Valley Highway project be completed, Tulita and Norman Wells would no longer be eligible for the Nutrition North Canada (NNC) subsidy or the Harvesters Support Grant and Community Food Programs Fund. To support a smooth transition, NNC's procedure has been to continue providing the subsidy for a transitional period no greater than one year after the road is operational. This was done in Wha Ti, for example, to assist the community while it established logistical networks to transition to surface transportation. If under any circumstance the road was to close due to emergencies, temporarily isolated communities may also be eligible to receive the subsidy during this period exclusively. This was the case when Dempster Highway closed two years ago due to flooding.</p> <p>In addition to the subsidy, the Harvesters Support Grant (HSG) and Community Food Program's Fund (CFPF) have also been designed to support isolated communities. Once an all-season road becomes operational, connected communities no longer qualify for HSG/CFPF funding.</p>

		<p>would not lead to an associated increase in food security” (p.9-92).</p> <p>This analysis brings concerns that the number of households that worry about having enough money for food may increase if the subsidy disappears, as the access provided by the all-season road does not guarantee lower food costs.</p> <p>In their answer to Review Board’s comment #7, the GNWT noted that “due to the way the Nutrition North program works, removal of communities from access to the subsidy upon being connected to an all-season road is suboptimal for NWT communities. The GNWT suggests that discussions between Health Canada (and other appropriate Government of Canada departments), GNWT and Indigenous Governments take place on issues related to the Nutrition North program and broader issues of responsibility to food security and socio-economic issues as part of the environmental assessment process.”</p> <p>The Review Board is looking for a response from the Nutrition North Program.</p>		
89	<p>Culture, Traditional Land Use, and Harvesting: Caribou and moose, harvest pressure, management actions (DAR Chapter 5, WMMP, 10.7.2)</p>	<p>Section 10.7.2 notes that there are gaps in current harvest knowledge and in potential increases in harvest, and that Indigenous harvest information for caribou and moose was not available and not considered in the DAR.</p> <p>It will be important to develop and implement adaptive co-management regimes for boreal caribou and moose with Indigenous Governments and organizations in the Dehcho and Sahtú regions.</p> <p>Future wildlife management decisions will need to include regular population monitoring to ensure sustainable use (harvest) of caribou and moose.</p> <p>Please coordinate with Norman Wells, Tulita, and any other relevant Renewable Resource Councils in responding to this question.</p>	<p>A. In the SRRBs opinion, do you believe there are current stressors, including harvest, to caribou numbers? Will this project add to those stressors?</p> <p>B. Please provide examples of harvest monitoring (such</p>	<p>Please see attachment</p>

			<p>as guardian programs and Traditional Knowledge-based monitoring) that have been tried on other highways (such as the Inuvik-Tuktoyaktuk Highway, Tłıchǫ Highway) or other regions.</p> <p>C. Please describe any engagement with Indigenous Governments or co-management Boards on potential monitoring programs.</p>	
90	<p>Culture, Traditional Land Use, and Harvesting: Caribou and moose, harvest pressure, management actions (DAR Chapter 5,</p>	<p>Section 10.7.2 notes that there are gaps in current harvest knowledge and in potential increases in harvest, and that Indigenous harvest information for caribou and moose was not available and not considered in the DAR.</p> <p>It will be important to develop and implement adaptive co-management regimes for boreal caribou and moose with Indigenous Governments and organizations in the Dehcho region. The Review Board is interested in the role of Guardians or other programs related to harvest monitoring in the Dehcho region.</p>	<p>A. In the DFN's opinion, do you believe there are current stressors, including harvest, to caribou numbers? Will this project add to those</p>	

	WMMP, 10.7.2)	Future wildlife management decisions will need to include regular population monitoring to ensure sustainable use (harvest) of caribou and moose.	<p>stressors?</p> <p>B: Please provide examples of harvest monitoring (such as guardian programs and Traditional Knowledge-based monitoring) that have been tried on other highways</p> <p>C. Please describe any engagement with Indigenous Governments or co-management Boards on potential monitoring programs.</p> <p>D. Are there community-based monitoring programs the Review Board should follow up on?</p>	
91	Culture,	The GNWT funded and used the results of your Traditional Land	Could you please	

	Traditional Land Use, and Harvesting: TRRC TLRU study (DAR Table 2.2)	and Resource Use (TLRU) study in preparation of the DAR. The Review Board would appreciate being able to review this document to consider how it was incorporated into the project planning and the developer's assessment. This document may be kept confidential at the request of the knowledge owners.	submit your TLRU study (in electronic or hard copies) to the Review Board for review, and indicate if you would like it handled confidentially?	
92	Culture, Traditional Land Use, and Harvesting: NWRRRC TLRU study (DAR Table 2.2)	The GNWT funded and used the results of your Traditional Land and Resource Use (TLRU) study in preparation of the DAR. The Review Board would appreciate being able to review this document to consider how it was incorporated into the project planning and the developer's assessment. This document may be kept confidential at the request of the knowledge owners.	Could you please submit your TLRU study (in electronic or hard copies) to the Review Board for review, and indicate if you would like it handled confidentially?	
93	Culture, Traditional Land Use, and Harvesting: LKFN TLRU study	The GNWT has provided funding for a Traditional Land and Resource Use (TLRU) study by LKFN. When this study is complete, the Review Board would appreciate being able to review this document to consider how it was incorporated into the project planning and the developer's assessment. This document may be kept confidential at the request of the knowledge owners.	When your TLRU is complete, could you please submit it (in electronic or hard copy) to the Review Board for review, and indicate if you would like it handled confidentially?	

94	Culture, Traditional Land Use, and Harvesting: PKFN TLRU study	The GNWT has provided funding for a Traditional Land and Resource Use (TLRU) study by Pehdzeh Ki First Nation. When this study is complete, the Review Board would appreciate being able to review this document to consider how it was incorporated into the project planning and the developer's assessment. This document may be kept confidential at the request of the knowledge owners.	When your TLRU is complete, could you please submit it (in electronic or hard copy) to the Review Board for review, and indicate if you would like it handled confidentially?	<p>Pedzeh Ki First Nation's Traditional Land and Resource Use study is not yet complete. We expect to complete and review this study in October - November 2024. We will be able to respond after our review.</p> <p>We request detailed information about how MVEIRB receives, reviews, stores, and protects confidential submissions.</p> <p>See PDF attachment for the full letter.</p>
95	Letter from Acho Dene Koe First Nation	Acho Dene Koe wrote to the Review Board on August 6, 2024 (PR#242). The Review Board is of the view that it would be appropriate for the developer to respond to the issues and comments raised in the letter relevant to the GNWT.	Please provide a response to the issues and comments raised in the letter that are relevant to the GNWT.	
No.	Topic	Reviewer Preamble	Reviewer Request	Response
Deline Got'ine Government - Todd Slack				
1		Please find the initial Information Requests from Délı̨ne Got'ı̨ne Government	Requests are submitted for GNWT and Canada. Please provide thorough, direct, and complete answers.	
2	IR 1 – Mitigation effectiveness, Significant	In the response to Review Board Overarching IR 3 the GNWT noted that it “has not completed a systematic review of the effectiveness and limitations of each of its programs and plans”.	Please provide clear and complete answers to the	Please see the attached document.

	<p>Impacts and the Purpose of Environmental Assessment: Nature of the assessment process</p>	<p>This introduces a fundamental issue in the assessment process. The purpose of Measures is to bring impacts below a significance threshold. Without understanding if the past mitigations have been effective, it creates a great deal of uncertainty around the confidence of future mitigation effectiveness. Parties cannot be confident that the mitigations arrived at will be effective.</p> <p>In short, it is not clear if the impacts from the Tłı̄chq Highway have been significant, with the supplementary question on whether that was incidental or due to the mitigations.</p>	<p>following:</p> <ol style="list-style-type: none"> 1) Understanding the contributing factors, does GNWT believe that any effects from the Tłı̄chq Highway have been significant? 2) Does GNWT believe that the monitoring and mitigations due to Measures were effective in reducing the impacts below the significance threshold? 3) Since 2021, please indicate: <ol style="list-style-type: none"> a. The total budget for the programs cited as part of the social and well-being 'net' b. The amount of funding provided to support monitoring and 	
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			<p>managing of affects specifically associated with the Tłıchǫ Highway.</p> <p>4) In the three years prior to 2021, what was the total budget for:</p> <p>a. The programs cited as part of the social and wellbeing 'net'</p> <p>b. Any TASR specific monitoring projects.</p>	
3	IR 2 – Acknowledged Significant Impacts and the Need for Measures	GNWT has acknowledged that there are to be significant impacts as a consequence of this project. In addition to any other significant impacts found by the Board, these will require Measures (mitigations) to reduce their impact below the significance thresholds. DGG wishes to ensure that there is clarity amongst the proponent and the parties that this is a required outcome.	<p>1) Can GNWT confirm that Measures will be required for those areas where GNWT predicts significant impacts will occur.</p> <p>2) GNWT has established that there will be a significant impact. Can they</p>	Please see the attached document.

			<p>provide a narrative description of the significance threshold(s) that the mitigations must lower the impact below? If the project has a value (numeric or narrative) or monitoring in place, what effects within Délı̄nę represent a call for greater action (understanding that this is a work in progress)?</p> <p>3) Does GNWT believe that Measures will be need for those areas that do not have plans, but are not yet acknowledged as having significant effects?</p>	
4	IR 3 – Ensuring sufficient information to	Given the EA Terms of Reference are quite explicit in terms of the Key Lines of Inquiry, the lack of information around social and economic considerations creates quite a limitation in the actual	In order to facilitate assessment,	Please see the attached document.

<p>complete the steps of an Environmental Assessment: Ability to Assess Impacts – Structural Needs/Provisions</p>	<p>assessment of effects. When coupled with lack of proposed mitigations and the uncertainty of mitigation efficacy, it leaves Parties in a difficult position to be able to effectively utilize the EA process. MVH has had a decade with this project and has not yet developed the necessary plans – making the choice to do so after the EA. This is not acceptable.</p> <p>Déłjñę understands and supports that the project approach of working with the impacted communities to develop and deploy mitigations and monitoring. To undertake the development of these management steps after the EA creates a power imbalance in addition to the compromised assessment – should there be a conflict on the necessary mitigation post-EA, GNWT retains all decision-making authority.</p> <p>At a minimum, the Proponent should create an outline, based on its experience with its other road projects, that provides clear commitments (stated and funding), goals/objectives, and criteria (where able) that will represent the initial ideal for the management effort. DGG doesn't believe that this is reinventing the wheel as we are learning from the successes and failures of the past - this may simply be porting over the management structure for TASR. This represents a minimum proposal that allows assessment and the creation of commitments in the EA process. Déłjñę acknowledges that these are drafts for consideration, to be worked on by the eventual Mackenzie Valley Highway Corridor Working Group</p>	<p>please provide an initial framework that provides best management and monitoring practices developed from the Inuvik to Tuktoyaktuk Highway (ITH) and Tłjchq All-Season Road (TASR). DGG accepts that this represents only a base case for the MVH, with meaningful, collaborative, design work yet to come.</p> <p>Specific Questions:</p> <p>1) The creation and activation of the Corridor Working Group allows only one year (prior to construction) to create the sub-groups, approve plans, and</p>	
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			<p>provide all coordination. During this time there is only two meetings planned for this group. This feels like a monumental effort – given the standup and composition of the body is yet to be completed. For these plans or themes not to have a working draft or starting proposal, never mind not even being initiated, is troubling as it's the first KLOI and Déljñę 's largest concern. Given the pace of government initiatives can be quite slow (see GNWT 2023 Fire Review which just started), this feels inadequate given the significance. Given the</p>	
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			<p>political desire for this project to proceed makes the core question of its development a 'when' rather than an 'if', what rationale does GNWT have for not initiating this work immediately?</p> <p>2) Similar to the time constraints around the Corridor Working Group, the sub-groups will have less than a year prior to construction (allowing for the larger group to meet and agree to sub-group membership) to collectively draft, review and approve drafts, issue them for the working group's consideration. This is to be</p>	
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			<p>done with only 4 meetings and with limited support and unclear processes. Is this reasonable?</p> <p>3) Délı̄në is not one of the local affected communities but will be exposed to indirect and community effects that DGG believes require monitoring and mitigation. Does GNWT accept that communities in the RAA have an important perspective and will be exposed to impacts in similar ways as other communities (i.e. drugs and alcohol will be much more accessible) and should be members of the</p>	
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			<p>steering committees created as part of the corridor working group?</p> <p>4) DGG notes that there are two positions described in the DAR – one charged with coordination and one with SEIA monitoring.</p> <p>i) Relative to Construction start, when will these two positions be hired?</p> <p>ii) Given the critical nature of the work (KLOI, significant concerns, primary community interests), this seems insufficient overall. If this project were approved, how many other staff does GNWT</p>	
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			<p>believe would be working on the project?</p> <p>iii) If unknown, can the proponent anticipate the comparative level of staffing between socio-economic issues and others – would staff associated with avoiding, monitoring and managing impacts to communities amount to 1% of staff?</p> <p>5) In the TASR process, DGG understands that TCG was the central body for the working groups. The current proposal has GNWT as the central coordinator.</p> <p>i) What was the rationale for the change?</p>	
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			<p>ii) Is GNWT open if other orders of government believed that a non-GNWT member should be the chair or coordinator?</p> <p>6) Given the power imbalance between different orders of government post-EA (where GNWT has complete freedom of action in an area of public governance where it's the only real authority), what conflict resolution recourses will GNWT institute for the Corridor Working Group if there are strong disagreements in approach or needs? DGG</p>	
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			<p>does not believe that this is likely, but this is an issue introduced by the proponent's choice to develop core mitigations outside the environmental assessment process. If community and Indigenous governments cannot assess during the EA and satisfied with the mitigations, this will be moot, but it's a necessary requirement in case there are intractable disputes on the mitigations necessary to reduce impacts below significance.</p>	
5	IR 4 – Visual Timeline of Construction and Socio-	DGG is concerned that the project timeline lacks flexibility and as currently designed, will limit options and result in less than ideal outcomes. However, from our perspective, we have a limited comprehension as to how the different parts of the project come	Please provide a compiled timeline that looks are the	Please see the attached document.

	Economic Programs	together.	<p>activities of each of the sub-groups within the Corridor Working Group.</p> <p>While we leave the key points to the developer, DGG's interest is in removing uncertainty around these matters. For instance, the timeline should include the project's RFP issuance, the awarding of principal contracts, any critical subcontracting dates, as well as notable construction dates.</p> <p>- DGG understand that these dates are to be determined, so suggest that the project uses a</p>	
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			nominal temporal scale based on the construction date, with all points referenced to that origin. Thus, the corridor working group start date is C-365 (one year prior).	
6	IR 5 – Describing What a Successful Project Looks Like – Economic Benefits	DGG believes that all parties would benefit from a narrative description that provides some details that expand on the project’s goals or intentions with regard to economic benefits and how we know that they have been achieved. DGG leaves this to the proponent to write, though we ask for some simple metrics to be included. For example, the 50% northern hiring target is a useful, simple statement that addresses the interest of knowing what general positives can be expected out of the construction phase.	1) Please provide a short general description of what benefits this project will result in from a community point of view, with regards to training, employment, and contracting.	Please see the attached document.
7	IR 6 – Ensuring Benefits to Sahtu Residents from Project Construction – Skills/Training	DGG is deeply concerned that a significant portion of the envisioned benefits are at risk of not being delivered – through structural limitations and a lack of detailed planning and commitments. DGG simply wants to ensure that all reasonable steps are being taken to prepare Sahtu residents to take advantage of the opportunities from the project. This means developing and deploying training and educational programs and where necessary, building infrastructure to support the delivery of programs, before the project commences.	1) The Plan commitments (s. 9.16.2.2.1) largely indicate identification of gaps/barriers, local resources, as well as other information gathering efforts. It does	Please see the attached document.

			<p>not commit to deliver programs that will increase skills, trades experience or hours, or actually expand the labour resource. If properly understood, the outcome of this project, on or near the start of construction, is largely informational rather than actions or programs that would serve to improve or remedy the labour situation.</p> <p>a. Is the GNWT planning on delivery of any training or education programs that will improve the labour value in the Sahtu? For example, is the proponent intending to</p>	
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			<p>offer additional apprentice incentives targeted at the Sahtu? Are they providing improved higher education benefits for areas of study that may support the road construction? Is GNWT planning to work with local education authorities to improve grade school outcomes to broaden the pool of eligible students?</p> <p>b. If the project fails to meet its northern hiring targets, what consequences will occur to the GNWT project staff and project oversight? Is it just Sahtu and northern residents that bear the cost of failure?</p>	
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			<p>2) Please describe and evaluate potential effects of the project on the following, at both the general and community specific level: Proposed education and training programs required for highway-related construction and operation employment, including:</p> <ul style="list-style-type: none">i. Local and regional training opportunities;ii. Timing and duration of programs, in relation to the highway development schedule;iii. Skills and experience gained in the highway workforce that could be applied	
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			<p>to other available projects or sectors;</p> <p>iv. The number of people expected to be employable and available;</p> <p>v. The potential for local development of skills for senior professional positions (e.g. labourer/heavy equipment operator vs. supervisor/manager)</p> <p>vi. Proposed programs that would be provided by or sponsored by the developer.</p> <p>3) How will GNWT ensure that this project is not like other large projects in the territory and that they will provide skills training and</p>	
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			<p>employment opportunities to Sahtúot'ine? What steps are they going to take that projects like Giant Mine did not benefit from?</p> <p>4) Is the intent of the Contractor Training and Employment Plan to deliver training and improve northern employment?</p> <p>5) Does the GNWT continue to believe that it can deliver on its socio-economic commitments, including the intent of Contractor Training and Employment Plan, within the year prior to construction</p>	
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			<p>starts?</p> <p>On the face of it, there seems to be significant reason to doubt this. For contrast, at Giant Mine, a large public contracting project which has a decade of lead-up and site management, GNWT and Canada (co-proponents) have delivered virtually no training or education programs, and have consistently not (perhaps never) met their northern employment targets, yet there seems to little consequence to any of the groups involved in the process</p>	
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			<p>(government staff, project staff, construction manager, contractors).</p> <p>6) Délıne currently lacks the infrastructure to deliver skills and trades training programs. Is the GNWT willing to make a commitment with DGG's education department to design, fund, and construct an appropriate facility?</p> <p>a. In the absence of an appropriate building, what steps/supports are the proponent taking to allow a broader range of potential students to attend</p>	
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			<p>schools/training outside their community?</p> <p>7) What training targets or Key Performance Indicators does GNWT plan on establishing for this project? What does their research suggest are realistic and achievable goals for this project – what has been learned from other projects?</p> <p>a. TASR seemed to have successfully delivered the expected socio-economic benefits to the Tłıchq Region. Can the GWNT provide further information on that process and the lessons learned that will be used with this project? Details on the</p>	
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			<p>development timeline used for socio-economic agreements, monitoring and mitigations would be ideal information.</p> <p>8) How will GNWT contracting recognize training as part of bid proposals? GNWT's own promotion materials for the Canyon Creek All-Season Access Road make it plain how important resources and planning for training and employment was at the beginning of the project</p>	
8	IR 7 – Ensuring Benefits to Sahtu Residents from Project Construction:	As with other areas in the DAR, assessing this Key Line of Inquiry is difficult as there is a lack of information – leaving parties to seek key details to even understand the initial commitment. Instead of analyzing a draft proposal, we are forced to seek the information just to understand the commitment and the facts around any mitigation. In this case, it does not seem that the project is	1) GNWT commits to having 50% of the workforce drawn from the NWT. What is	Please see the attached document.

	<p>Northern and Indigenous Employment</p>	<p>intending to deploy programs to improve the probable outcomes. For DGG, failure to deliver meaningful training, employment, and/or contracting benefits as part of a generational construction program represents a significant failure.</p>	<p>not clear is the commitment to hiring Sahtu residents and particularly Indigenous Sahtu residents. Can the GNWT please provide clear information on what their goal is for local or regional hiring?</p> <p>2) Within the contracting phase, when assessing/scoring proposals please describe the weight that the proponent will place on northern hiring. What penalties or corrective actions will be written into contracts if the proposed commitments are not met?</p> <p>3) Please describe and</p>	
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			<p>evaluate potential effects of the project on the following, at both the general and community specific level:</p> <ul style="list-style-type: none">a. Direct and indirect employment opportunities generated by the development and the potential for uptake of these opportunities by Aboriginal peoplesb. Employment and income opportunities for every year of construction and operation with particular reference to wage and salary employment by length and form of employment skills categoryc. Measures, plans, and commitments for maximizing	
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			<p>local and Aboriginal Employment.</p> <p>4) For any non-governmental employers involved in this project, please indicate how GNWT will require improvements and training to correct for failing to meet hiring targets and/or other Key Performance Indicators that are developed. What actions will the proponent take when they fail to meet their targets? Please provide examples of GNWT actions to this effect in other large public works projects.</p> <p>5) Please provide</p>	
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			a discussion on how GNWT will report on their socio-economic targets and the project performance.	
9	Ensuring Benefits to Sahtu Residents from Project Construction - Northern Contracting	<p>As with other areas in the DAR, assessing this Key Line of Inquiry is difficult as there is a lack of information – leaving parties to seek key details to even understand the initial commitment. Instead of analyzing a draft proposal, we are forced to seek the information just to understand the commitment and the facts around any mitigation. In this case, it does not seem that the project is intending to deploy programs to improve the probable outcomes. For DGG, failure to deliver meaningful training, employment, and/or contracting benefits as part of a generational construction program represents a significant failure.</p> <p>Contracting is often the easiest aspect of Social Economic benefits to achieve (at the diamond mines, large infrastructure projects) but it requires planning and effort to ensure that the door is open enough for northern businesses who are at a competitive and scale disadvantage to southern outfits.</p>	<p>1) Within the contracting phase, when assessing/scoring proposals please describe the weight that the proponent will place on northern based companies? Will the BIP program be applied to the evaluation process?</p> <p>2) How will GNWT ensure that Joint Ventures meet the expectation of 'Joint' – that they are not simply shells where a southern company matches with a northern partner</p>	Please see the attached document.

			<p>in name only?</p> <p>3) How will GNWT structure contracts so that small businesses in the North can meaningfully bid and take advantage of potential opportunities? As an example of a past effort, at Giant Mine, the reclamation project heard the criticisms of its past efforts and has sought to provide breakdown packages at a variety of scales, providing a broader opportunity for northern businesses.</p>	
10	IR 9 – Community Disaster Response: Forest Fire Occurrence and Evacuation	DGG has reviewed the GNWT response to LKFN IR 7.1 regarding forest fire occurrence. The statement that the road will not have any increase on the probability of fire occurrence seems poorly founded. Furthermore, the project is compared against two other scenarios – the current winter road and the middle/upper Dempster Highway (unclear where the southern exclusion boundary is). The winter case is straightforward – the highway will	1) Will the construction of the MVH alter GNWT fire management priorities?	Please see the attached document.

	Support/Planning	<p>pose increased risk; while the Dempster comparison requires additional consideration. With a lack of information, DGG asserts that the middle/upper Dempster represents a different environment with much different vegetation densities and complexes than that of the Mackenzie Valley Highway project area.</p> <p>From the limited information, there is an incongruity in what GNWT thinks this road will provide. In the IR response, the anticipated use of the road can largely be described as a conduit for residents – with only a small amount of road-based harvesting access recognized beyond that. However, in the DAR, increased industrial use, tourism and local use seem to be recognized as possibilities. DGG believes the latter more likely – when we develop roads in the territory, increased use follows.</p> <p>When we combine the fact that the use of this area is moving from winter only (aka zero risk) to all seasons with a higher intensity, the growing risk associated after fire ignition, and the ability of the community to continuously respond to emergency matters, DGG wants to ensure that there are appropriate supports for communities forced to deal with these situations.</p> <p>DGG has accepted evacuees from Yellowknife and Fort Good Hope over the last two years, seeing our community grow 25% virtually overnight. This is work we are pleased to do – looking after family, elders and our neighbours is the Dene way. However, with this project, it is important that GNWT is prepared to support us as another order of government.</p>	2) As the threat increases, in the future, how does GNWT intend to provide improved community supports during emergency circumstances?	
No.	Topic	Reviewer Preamble	Reviewer Request	Response
Deline Got'ine Government - Mr. Jackie Siegel				
1	Déljñę Got'jñę Government: Jackie Siegel	Please find the follow-up Information Requests from Déljñę Got'jñę Government. Please treat this file as a single package together with the first set submitted by Todd Slack on August 8, 2024.	Requests are submitted for GNWT and Canada. Please provide	

			thorough, direct, and complete answers.	
2	IR 10 - Financial Support for Working Groups	<p>The Mackenzie Valley Highway Project - Developer's Assessment Report from October 2023 (DAR) states that "The GNWT has committed to develop and implement a Community Readiness Plan that includes several interconnected plans that are intended to address the adverse effects of the Project." Section 9.16 provides details on the structure and function of the Community Readiness Plans, outlining the role of Sub-Working Groups (Road Safety and Security, Training and Employment, and Social Monitoring and Adaptive Management) in developing and overseeing mitigation plans for the construction and operation of the MVH.</p> <p>The proposed structure engages multiple organizations and GNWT departments, over an extended period (from one year pre-construction to five years post-construction). This will require significant financial and in-kind investments from the GNWT and a considerable amount of coordination across all parties. The responsibilities of the Sub-Working Groups are likewise significant and important, and DGG is concerned that the onus to complete necessary work to identify, research, and mitigate a broad set of effects will require an appropriate investment on their behalf. The scope is significant and the community staff in place already have heavy workloads. Furthermore, given the breadth and depth of plans to be completed, MVH will wholly consume staff time, leaving existing challenges and initiatives incomplete.</p>	<p>1) DGG is looking for additional details around the Mackenzie Valley Highway Corridor Working Group (and its component groups). For the existing proposal of the Corridor Working Group, what are the anticipated fiscal and staff resources that GNWT will provide communities to complete this work? How will the CWG and all the sub-working groups be funded, and to what amount?</p> <p>2) Will Délı̄nę specifically be provided sufficient funds to participate in</p>	Please see the attached document.

			<p>the sub-working groups? What staffing resources will be made available?</p> <p>3) What role will Déłıne have on the sub-working groups? How will GNWT ensure that our participation be equitable to that of other communities?</p>	
3	IR 11 – Food Prices in Déłıne (GNWT)	<p>The DAR states that there will be “greater variety of groceries (easier to access groceries in other communities as well ability for greater variety of fresh foods to be provided all-season)” due to the all-season operation of the highway (section 9.5.5). The DAR also outlines measurable parameters related to food security in section 9.2.4.1, including cost of food (\$) and access to lower cost (high quality) food. As a community in the RAA, Déłıne is not likely to experience this benefit.</p> <p>Contrary to some of the anticipated benefits for communities along the road route, DGG is concerned that landed prices in our community will be negatively affected. As Tulita and Norman Wells move to the road net, aerial freight delivery and passenger traffic levels will be significantly altered, with a potential negative economy of scale being imposed on the communities that are reliant on the air-supply net (Déłıne, Fort Good Hope, and Colville Lake). As a result, Déłıne is concerned that some of the positive themes of the project for the connected communities will be net negatives for our community – primarily cost of living.</p>	<p>1) To what degree, if at all, is it expected that Déłıne will see a change in food prices with the operation of the MVH? How does this compare to expected changes in other Sahtu communities?</p> <p>a. What parameters and assumptions have been made for these calculations?</p>	Please see the attached document.

		<p>Please note IR 11 is submitted to GNWT in conjunction with IR 12 to CIRNAC.</p>	<p>Please describe (and submit) the work that GNWT has done to understand the consequential impacts of the project on the cost of food for Délı̄ne and the other remote communities.</p> <p>2) Given that DGG expects food prices to rise in Délı̄ne, has GNWT explored mitigations against this? How will GNWT ensure food prices do not rise in Délı̄ne?</p> <p>3) What is/are the specific parameter/s that will be used to measure food cost and food access, i.e. a specific parameter available</p>	
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			<p>through the NWT Bureau of Statistics? DGG expects that this is going to be measured at the community level and not just at the regional level.</p> <p>4) Please provide a discussion on the timing nature of these mitigations – Délı̄në is interested in a responsive tool rather than something that requires years and repeated political decisions.</p> <p>5) Please describe (and submit) the work that GNWT has done to understand the consequential impacts of the project on the cost of freight</p>	
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			<p>and passenger travel for Déljñę and the other remote communities.</p> <p>6) If cost of living is observed to increase in the remote communities, what mitigations are GNWT willing to provide to offset the impacts of its road?</p>	
4	IR 12 – Food Prices in Déljñę	<p>The DAR states that there will be “greater variety of groceries (easier to access groceries in other communities as well ability for greater variety of fresh foods to be provided all-season)” due to the all-season operation of the highway (section 9.5.5). The DAR also outlines measurable parameters related to food security in section 9.2.4.1, including cost of food (\$) and access to lower cost (high quality) food. As a community in the RAA, Déljñę is not likely to experience this benefit.</p> <p>Contrary to some of the anticipated benefits for communities along the road route, DGG is concerned that landed prices in our community will be negatively affected. As Tulita and Norman Wells move to the road net, aerial freight delivery and passenger traffic levels will be significantly altered, with a potential negative economy of scale being imposed on the communities that are reliant on the air-supply net (Déljñę, Fort Good Hope, and Colville Lake). As a result, Déljñę is concerned that some of the positive themes of the project for the connected communities will be net negatives for our community – primarily cost of living.</p>	<p>1) What work has Canada done to understand the impacts to Déljñę’s food mail program, as a result of this project?</p> <p>2) Given that DGG expects food prices to rise in Déljñę, Canada (Nutrition North) explored mitigations against this? How will Canada</p>	<p>In 2011, the Food Mail Program was replaced by the Nutrition North Canada (NNC) Program which encompasses a suite of food security initiatives, including the retail based NNC subsidy, the co-developed Harvesters Support Grant and Community Food Programs Fund. In 2022, the Food Security Research Grant was launched by NNC which has funded five ongoing Indigenous led research projects with the objective of increasing the evidence base to inform enhancements to the NNC retail subsidy model. These projects are now generating new knowledge on the impact of the NNC retail subsidy on food security among Indigenous Peoples in isolated communities, with a view to inform improvements to the subsidy to better support equitable access to store-bought food. One ongoing project led by Samba K’e First Nation seeks to better understand and improve upon barriers to receiving the NNC subsidy.</p>

		<p>Please note IR 12 is submitted to CIRNAC in conjunction with IR 11 to GNWT.</p>	<p>ensure food prices do not rise in Délıne? What mitigations are Canada willing to provide to offset the impacts of its road?</p>	<p>Two additional projects on subsidy pass-through and retailer accountability measures are also being undertaken at this time. One project led by Dr. Fred Lazar from York University has the objectives of developing methodology for determining the pass-through of the subsidy to produce inferences on how much of the subsidy is passed on to consumers. Dr. Lazar will also work closely with the program's third-party auditors to address gaps and provide recommendations on how to improve the program's accountability and transparency measures. The second project led by Dr. Andrew Spring from Wilfrid Laurier University seeks to answer what perfect pass-through of the subsidy would look like and how to design the program with this goal in mind. This project will look at supply chain management for northern communities, including Délıne. Collectively, these studies will provide additional evidence-based insights into food security challenges and opportunities available. The results will be considered, once available, and will inform future programming changes from an NNC perspective.</p> <p>Lastly, in order to comprehensively assess the effectiveness of NNC, a Departmental internal evaluation has been launched and will focus on NNC's expanded programming. The evaluation is using a partnering approach with Indigenous partners, communities, Elders, Knowledge Keepers and those who use NNC to evaluate the relevance, design, delivery, efficiency and effectiveness of NNC's 5 program areas. Sahtu representatives are part this exercise, and their observations and recommendations will be included in</p>
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				<p>recommendations stemming from the evaluation.</p> <p>2) Food security is a shared responsibility among all levels of government, and Nutrition North Canada will continue to support communities that are not connected year-round by permanent road, rail, or marine access. While benefits from this proposed project may be expected to be realized by communities connected by an all-weather road (e.g. more cost-effective access to food and essential items), it is important to recognize that those communities that are not connected (Déljñę, Fort Good Hope, and Colville Lake) will continue to benefit from the NNC subsidy program. NNC will monitor changing prices over time, and consider whether augmentations in the program are necessary, should prices change.</p> <p>In addition to the retail subsidy, NNC's Harvesters Support Grant and Community Food Programs fund are directly supporting Northerners' own food priorities, while improving conditions for food sovereignty within northern communities. Both the Sahtu Secretariat Inc. and the Deline Renewable Resources Council have been funded recipients since the programs were announced in 2019 and 2022, respectively. The Harvesters Support Grant increases access to country foods by providing funding to support traditional hunting, harvesting and food sharing in isolated communities. It also respects the inherent hunting and harvesting rights of Indigenous people in Canada. The Community Food Programs Fund was also co-developed with Indigenous partners to support and strengthen the work that communities do</p>
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				<p>to support local food security through culturally-appropriate, locally-led solutions. Examples include but are not limited to school food programs, elders meal programs, and group ordering. Through flexible funding opportunities delivered by Indigenous organizations, the Harvesters Support Grant and Community Food Programs Fund creates less reliance on store bought food, encourages the restoration of harvesting culture and practices, and supports local food production and community food sharing.</p> <p>Recognizing that NNC will not solve food security on its own, residents in isolated communities can be assured that that program continues to complement other federal and territorial programs addressing the multiple factors that converge to impact food security.</p>
5	IR 13 – Access to Traditional Foods	The DAR states that “Due to their distance from the Project, it is anticipated that the RAA communities will not experience any decreased access to wildlife resources” (section 9.9.5). However, DGG is concerned about the impacts on traditional food sources, particularly caribou and fishing, with the construction and operation of the highway.	1) What is the expected impact on caribou population and behavior along the MVH corridor, particularly in proximity to Délı̄ne? We want GNWT to consider the road itself, vehicle traffic, and the increased access for recreational hunting.	Please see the attached document.

			<p>a. How will this affect food security in Délı̄ne, with consideration to the availability of traditional foods and the impact on nutrition for Délı̄ne residents?</p> <p>2) What is the expected impact on fish populations in the Great Bear River? We want GNWT to consider the road itself and the increased access for recreational fishing and activities along the river.</p> <p>a. How will this affect food security in Délı̄ne, with consideration to the availability of traditional foods and the</p>	
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			<p>impact on nutrition for Déljñę residents?</p> <p>3) Given the stated effects on traditional foods from the project in general, and DGGs concern for our community specifically, what measurements and mitigation processes is GNWT willing to engage in to minimize any adverse impact in a manner that is proactive?</p> <p>4) Given Chapter 18 of the Sahtu Dene Metis Comprehensive Land Claim Agreement and the Sahtu Harvest Study, how will GNWT measure changes in caribou and</p>	
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			<p>other wildlife harvest for the purposes of assessing compensation under the Land Claim?</p> <p>a. Should caribou and other wildlife harvest drop below the minimum needs level threshold, as stated in the Land Claim and Sahtu Harvest Study, what mitigations are GNWT prepared to do to meet their legal obligations with reference to the Land Claim?</p>	
6	IR 14 – Health Data	<p>There is a general lack of community data available across the NWT, for understandable reasons such as small population numbers and low incidence rates of disease and other quantifiable health measures. This nevertheless makes planning for health programs, including addressing health outcomes as a result of this project, particularly challenging at the community level. It is not enough to rely on regional data as each community has a unique context and will be impacted differently by the highway.</p>	<p>DGG wants GNWT to provide more resources towards increasing the capture, analysis and sharing of health data, particularly publicly available</p>	<p>Please see the attached document.</p>

			<p>community health profiles. Given that substance use and mental health are explicitly stated as concerns in the DAR, DGG is asking the GNWT to develop stronger measurements around these areas.</p> <p>1) Is GNWT willing to commit to additional resources for improved monitoring and sharing of substance use and mental health data at the community level at the outset of this project?</p> <p>2) Understanding that current practice limits</p>	
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			<p>the collection and sharing of such data due to privacy concerns, but given that DGG, as an indigenous government, is granted ownership of the data of its citizens and members (see OCAP: https://fnigc.ca/ocap-training), will GNWT commit to proactively work with communities to make localized data easily available for the purposes of monitoring and responding to effects of the highway construction and operation?</p> <p>a. How will GNWT ensure that health data monitoring continues</p>	
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			throughout and beyond the timeline of this project? How will GNWT ensure that communities are supported through relevant, timely, and available health data to monitor and respond to health concerns?	
7	IR 15 – Drugs and Alcohol	Substance use is already an area of great concern for Délıne without introduction of the highway. The DAR states that “Health centre staff in Délıne noted that more drugs and alcohol in Tulita would result in more drugs and alcohol in Délıne, due to the proximity of the communities to each other” (section 9.5.6). Changes in community/social ties and social pressures due to the construction and operation of the highway will have an adverse effect on drugs and alcohol in Délıne, and DGG must be confident that sufficient resources are committed to addressing these effects.	<p>1) Can GNWT provide community level data for alcohol and drug use in Sahtu communities? How often is this data collected and released?</p> <p>2) As drug and alcohol use increases in LAA communities, how will Délıne be affected? Please describe (and submit) the work that GNWT has done to</p>	Please see the attached document.

			<p>understand the impacts and pathways of the project on drugs and alcohol in Délı̄ne and other remote communities.</p> <p>3) Can the GNWT provide data on drug and alcohol use behavior changes from the TASR and Tuktoyaktuk highway projects? As Gameti is a similarly 'off-road' community, this might be a useful comparator for Délı̄ne.</p> <p>a. What lessons can GNWT take from other projects that it will apply to the MVH project to mitigate increases in drug and alcohol use</p>	
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			<p>in LAA and RAA communities?</p> <p>4) DGG believes that drug and alcohol mitigation strategies need to be comprehensive and sufficiently resourced. How much funding and staffing is currently allocated in each community for drug and alcohol prevention and addictions treatment. What mental health services are available in each community (for substance use and more)?</p> <p>a. What resources and mandate will the Corridor Working Group and sub-working groups have to specifically monitor and</p>	
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			<p>mitigate drugs and alcohol? Will GNWT commit to responding to concerns raised by the working groups?</p> <p>5) If the highway is built, what are the minimum steps necessary to provide prevention, treatment and mental health services in communities? Will GNWT commit to long-term funding of treatment programs? (Note, Community Readiness Strategy is funded until 5 years of operation).</p> <p>a. How long have similar road working groups been funded to Tlicho?</p> <p>b. Does GNWT</p>	
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			<p>believe this is sufficient time to measure and make changes? If so, why?</p> <p>c. For these programs, what were the funding levels before and after the construction of TASR?</p> <p>6) What plan does the GNWT have to address drugs and alcohol enforcement (trafficking, bootlegging) along the MVH? If this strategy is meant to be developed by the sub-working groups, does GNWT believe there is sufficient time and resources to implement this upon the opening of the highway. DGG expects this plan</p>	
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			<p>to include at least the GNWT, RCMP, tow truck services, and other emergency services.</p> <p>7) Given responses to all the above, does GNWT believe this is sufficient to address adverse effects on drugs and alcohol from the highway?</p>	
8	IR 16 – Health Equity across the Region	DGG believes there is a significant likelihood that health equity will become a greater problem than already exists if the highway is built. Health services are lacking as is, and as LAA communities benefit from improved access to services, DGG expects that Délı̄ne, as an RAA community, will not experience these benefits at the same rate or level, if at all.	<p>1) What benefits vis-à-vis health services does GNWT expect LAA communities to experience as a result of the operation of the highway? What is the expected timeline of these benefits? For example, how long after the opening of the highway might health services be added or</p>	Please see the attached document.

			<p>increased in LAA communities?</p> <p>2) What adverse effects on health services does the GNWT expect RAA communities to experience as a result of the highway, considering factors such as reduced air traffic to the region and concentration of services in LAA communities?</p> <p>3) Will the GNWT commit to taking a proactive approach to address any gaps in health services in RAA communities? Is the GNWT prepared to commit resources to ensure equitable health outcomes</p>	
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			among all communities, regardless of their proximity to the highway?	
No.	Topic	Reviewer Preamble	Reviewer Request	Response
Liidlii Kue First Nation (Ft Simpson) (LKFN) - Trieneke Gastmeier				
1	Response to LKFN Comment #10	The developer's response is not sufficient because the proponent seems to aim at discrediting the Plante et al. (2018) study by suggesting that behavioural studies without a link to demographic consequences do not demonstrate a change in caribou recruitment rate. While the Plante et al. (2018) study may not address caribou recruitment rates directly, the topic of concern is not changes in caribou recruitment but rather, indirect habitat change from the development of the project. The proponent's suggestion that the results of Plante et al. (2018) study are not useful for predicting effects of the project on caribou due to different biomes is not supported by any evidence provided by the proponent.	Given that all caribou in Canada belong to a single species, the proponent must provide scientific evidence indicating that caribou populations will respond differently to similar project disturbances within different biomes.	<p>The assessment is focused on the consequences of disturbance-induced indirect habitat change to boreal caribou, specifically, how the Project might affect population trends through the combined effects of increased predation and avoidance on caribou survival and recruitment. As stated in the initial response, the Environment Canada (2011) study assessed a recruitment-disturbance relationship for boreal caribou using several disturbance buffers and found 500 m to be the most supported. It provides the best evidence and framework for the Project, and is accepted by ECCC (Environment and Climate Change Canada 2020) and the GNWT (Government of Northwest Territories 2022) for boreal caribou management planning. The statistical detection of spatial avoidance (e.g., Plante et al. 2018) does not help explain effects on caribou population trends, and requires a leap in inference from behavioural changes to population parameters (i.e., survival and recruitment), which is unsupported by the data and analyses used in such studies.</p> <p>Furthermore, studies that have tested spatial avoidance and estimated large ZOIs for roads in northern latitudes occur in relatively isolated settings with few alternative sources of disturbance (e.g., Boulanger et al. 2012, 2021, 2024). In contrast, the Project is proposed to occur along a corridor of human settlements and other anthropogenic disturbances. Permanent settlements have the largest potential ZOIs, presumably due to the mortality risks associated with hunting (Johnson and Russell 2014). Results from the movement</p>

				<p>analysis of GPS-collared boreal caribou also suggest that caribou already avoid the Project's corridor due to existing habitat conditions, natural barriers, and disturbances (EDI Environmental Dynamics Inc. 2024).</p> <p>Using ECCC's 500 m disturbance buffer allows for the assessment of indirect Project effects on caribou habitat selection and population parameters within the Project's landscape context and the GNWT's range planning framework. Applying a very large disturbance buffer around the Project is not supported by the available evidence, nor does it help evaluate potential population-level effects on boreal caribou.</p>
2	Response to LKFN Comment #12	<p>The developer's proposed follow-up and monitoring for invasive species is not sufficient. The proponent states that mowing is an effective control method for invasive species, while providing no evidence for this claim from within the scientific literature. Instead, the proponent has provided a list of references which includes manuals and brochures developed by provincial governments. The provinces that have made these resources available also have known invasive species issues along many of their highways. Furthermore, the proponent concludes that hand pulling of invasive species is an effective control measure but is not feasible for this project due to the size of the MVH. The current mowing strategy and lack of alternative options for invasive species management indicates to LKFN that the proponent is not interested in doing what it takes to ensure that invasive species do not establish and spread along the MVH.</p>	<p>The proponent should provide an alternative invasive species management regime that is backed by scientific evidence.</p>	<p>The GNWT is mindful of the economic and ecological impacts from non-native invasive plant species. The GNWT surveys NWT highways for exotic plants every ten years (Oldham & Delisle-Oldham 2017), the next survey is expected in 2026. The current state of knowledge about invasive alien species is most up to date in the Northwest Territories Species Monitoring Infobase (GNWT 2024) and summarized in the NWT State of Environment Report every five years. The presence of invasive species will be further evaluated in the planned Project footprint prior to, during and after construction.</p> <p>Limiting opportunities for non-native plant establishment is important (Langor et al. 2014) and recognized by the GNWT. Of the 72 non-native invasive plant species potentially occurring in the Project regional study area, 34 have been observed along the Mackenzie Valley Winter Road, which overlaps the planned Project route (Mackenzie Valley Highway Project Technical Data Report – Vegetation and Wetlands, Appendix B, Table B.1). Several of the non-native invasive species have also been documented elsewhere in the NWT (Porsild and Cody 1980; Northwest Territories Council on Invasive Species, Pests, and Pathogens 2023).</p>

				<p>Mowing has been found to be effective at limiting non-native plant abundance, growth, and reproduction, including for several of the non-native plants observed along the Mackenzie Valley Winter Road (Najda et al. 1982; Woo et al. 1991; Cole et al. 2007; Basky 2016; Bajwa et al. 2019). Additionally, as previously indicated, mowing is a well-established control method for invasive species along highway embankments in the NWT and throughout Canada (Government of British Columbia 2010; Government of Saskatchewan n.d.). Mowing is the standard practice for invasive species control, woody vegetation control, and maintenance of line of site for highways in the NWT (GNWT 2010, NWT Council on Invasive Species, Pests, and Pathogens 2022 a & b). As such, proposed Project non-native invasive species control measures are in alignment with accepted standards for NWT and other provinces.</p> <p>Timing and frequency influences mowing effectiveness, and repeated application (the GNWT conducts mowing approximately every three years along highway right-of-ways) generally improves effectiveness. Non-native plant abundance and distribution will be evaluated before and following mowing and alternative control measures, including hand removal of plants, application of biocontrol agents, and competitive seeding or planting, will be considered if local infestations are identified that require additional control. This would also be considered if low growing non-native plants that are less likely to be affected by mowing, or some annual species (e.g., European stickseed [Lappula squarrosa] [Frick 1984], oxeye daisy [Leucanthemum vulgare] [Clements et al. 2004]) are identified. The locations and frequency of control measures will be adaptively determined based on post-construction monitoring observations, with measures adjusted accordingly.</p>
3	Response to	The proponent has not meaningfully responded to our request for	Provide	The GNWT's preference is to promote re-establishment of

	<p>LKFN Comment # 15</p>	<p>more information about the vegetation reestablishment plan, and continues to use general words such as “hydroseeding and willow staking”. The proponent has not provided LKFN with a list of species that will be used in plantings or seedings as per our request. This leads LKFN to believe that the proponent does not have a clear plan for vegetation establishment and may consider planting and/or seeding non-native species.</p>	<p>additional information about the vegetation reestablishment plan, including the specific species the developer plans to establish</p>	<p>natural vegetation, rather than seeding or planting. This can be done by salvaging and replacing topsoil, de-compacting compacted soils, leaving soils rough and loose, and mulching and windrowing cleared vegetation. Planting of willow stakes (willow staking), or seeding may be needed in specific areas, where natural re-establishment of vegetation is inhibited by susceptibility to erosion, in accordance with best management practices in the GNWT Department of Transportation (DOT) Erosion and Sediment Control Manual (GNWT 2013). The GNWT DOT Erosion and Sediment Control Manual was developed using guidance from other Canadian provinces and such management practices have proven effective at re-establishing vegetation adjacent to roads. Following the Northern Land Use Guidelines, Camp and Support Facilities (GNWT 2015), the GNWT resource management officer and revegetation specialists will be contacted for further advice on revegetation measures.</p> <p>Where needed to address erosion, willow staking with locally harvested native willow species, and seeding using plants native to the Northwest Territories will be considered. The species to be used will consider the site-specific conditions (soil, moisture, aspect, slope, etc.) and the commercial availability of seed. Specific locations within the Project Development Area that may require staking/seeding will be identified during detailed design. Proposed erosion control methods involving staking or seeding will be described in more detail as part of regulatory approvals. A site-specific seeding/planting plan will include details of the seed mixes, willow harvest areas, application methods and schedule.</p> <p>A list of vegetation re-establishment plant species cannot be provided. The GNWT does not have lists of preferred reclamation species for the NWT, as such a list does not exist. As previously noted, if local seeding is needed, the species selected for use will be guided by local and regional</p>
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				vegetation conditions, site concerns (e.g., erosion), and commercial availability.
4	Response to LKFN Comment #19	We will assess based on the response provided to the related IR submitted by the Board.		<p>The Government of the Northwest Territories (GNWT) responded to the Mackenzie Valley Environmental Impact Review Board (MVEIRB)'s Information Request (IR) #1 on June 19, 2024. The 'optimal timeline' of 3-4 years referenced in that response does not replace the GNWT's proposed project and project construction schedule of 10 years of construction over a 20-year period, that is described in the Developer's Assessment Report (DAR). Rather, the GNWT considers the 3-4-year construction timeline an alternative method to construction.</p> <p>The GNWT is submitting a supplemental filing (Supplement to the Developer's Assessment Report Chapter 7: Assessment of Alternatives) to be posted on the public registry, which will provide a qualitative assessment of the accelerated construction timeline.</p>
5	Response to LKFN Comment #20	See attached letter from Chief Kele Antoine to the MVLWB and GNWT regarding the Redknife River Bridge Project. The Redknife Bridge project has the same proponent as the MVH. In that particular case the Proponent rejected LKFN's requests for preferential hiring and procurement and the MVLWB supported the request. Given this recent experience for LKFN with GNWT on a smaller linear infrastructure project, the GNWT's response to LKFN comment 20 is not satisfactory. GNWT-INF has shown it lacks a sincere commitment to Indigenous participation and procurement, implementing Truth and Reconciliation Commission's Call to Action #92 and the principles of UNDRIP. Most recently, contracts related to archaeology, fish habitat research and bathymetric studies went out with no notification to LKFN. LKFN requires the MVEIRB, MVLWB and GNWT-INF to make firm commitments around Indigenous contracting and procurement .	<p>a. LKFN requests that GNWT-INF make a firm minimum commitment that Indigenous procurement for the MVH will be proportionate to the percentage of the population in the NWT that are Indigenous (approximately 50%).</p> <p>b. To</p>	Please see the attached document.

			<p>facilitate the success around procurement and other GNWT / Canada commitments while meeting a more ambitious timeline to commence construction requested by nearly all Indigenous Nations and local governments, LKFN requests that the Mackenzie Valley Highway Corridor Working Group (MVHCWG) commence meeting during 2024, with the sub-working groups to commence in 2025.</p>	
6	Response to LKFN Comment # 21	LKFN requires a commitment to incorporate LKFN Guardians into monitoring water and sediment quality	Provide a commitment to incorporate LKFN Guardians into monitoring	Community-based monitoring programs, including Guardians, will play an important role in environment monitoring for the Project. As noted in Section 23.5.1 (Indigenous Participation in Monitoring), and elsewhere in the DAR, the GNWT has committed to discussing with LKFN, and other Indigenous

			water and sediment quality	Governments, Indigenous Organizations, and other affected parties how best to integrate community-based monitoring (including Guardians) into the Project, as environmental monitoring is a required and important part of the Project.
7	Response to LKFN Comment #22 & #23	This section requires additional comment and response from permafrost researchers. LKFN's comments on this section will be forthcoming.		Please see the attached document.
8	Response to LKFN Comment #28	Not Addressed. LKFN will email Robin Staples for data. Note that impacts to water quality must have some quantitative assessment.		<p>For the reasons provided in the original response to LKFN-28, the GNWT does not intend to quantitatively assess the potential for project-related changes to water and sediment quality from non-point source discharges, as there is no model to quantitatively predict such changes. The GNWT, in the assessment, conservatively assumes that if not mitigated, changes to water quality could happen. The GNWT then goes on to identify standard mitigation measures and best management practices (as described in the DAR) that are considered to be sufficient for these types of projects to prevent or reduce potential project-related effects to surface water and sediment quality. To specifically address potential changes to water quality from in-stream construction, water quality monitoring at culvert installation sites will be used to quantitatively measure potential project-related changes to surface water quality relative to upstream reference sites during construction and mitigative actions taken as appropriate, if required. Proposed water quality monitoring during culvert installation is described in detail in the Erosion and Sediment Control Plan (ESCP; DAR Volume 5). The proposed monitoring of turbidity in relation to total suspended solids in water is commonly required for temporary in-stream works such as culvert installations, including past and ongoing road and highway improvement projects in the NWT.</p> <p>As per the ESCP, monitoring results will be used to immediately inform the need for adaptive management and</p>

				<p>additional site-specific mitigations should water quality at monitoring sites exceed predetermined action levels [e.g., changes in turbidity greater than 8 nephelometric turbidity units (NTU) relative to reference sites]. Turbidity is a useful indicator of changes in water quality as it can be instantly and quantitatively measured in situ, allows for rapid adaptive management responses, and can be used as a proxy to indicate changes in suspended sediments associated with in-stream construction activity. The ESCP and results of monitoring will be reviewed annually, with input from Indigenous Governments, Indigenous Organizations, and specific other affected parties, as appropriate, during the construction of the Project to capture lessons learned from the previous year's construction and monitoring activities for consideration of any ongoing improvements in the ESCP. Following construction, the ESCP will be reviewed every 5 years.</p>
9	<p>Response to LKFN Comment #30</p>	<p>LKFN requested site-specific mitigation plans for 4 sensitive crossings where Arctic grayling may be present. The proponent has provided a non-answer based on using best practices.</p>	<p>LKFN requests a much more detailed response, including specific measures, along with detailed plans/diagrams for erosion and sediment control measures at Prohibition Creek, Four Mile Creek and Twelve Mile Creek. It would be OK for this information to be provided at a</p>	<p>The referenced Prohibition Creek, Four Mile Creek and Twelve Mile Creek, as well as other major watercourses between Wrigley and Norman Wells, are crossed by existing bridge structures. These existing structures include permanent erosion control measures such as rip rap to mitigate for sedimentation into water. There are no new structures planned to be built at these crossings as part of the Project. The Project will make use of these structures during construction for transporting equipment and materials. The mitigation measures in the Erosion and Sedimentation Control Plan (which also makes reference to the GNWT Erosion and Sedimentation Control Manual (GNWT, 2013) are considered to be effective at addressing erosion and sedimentation from project activities, which includes working near water.</p> <p>At other, smaller, watercourse crossings along the route, site-specific erosion control measures, such as rip-rap, will be incorporated into the design of crossing structures, and will</p>

			later phase of the project, once more detailed design is conducted.	be submitted to regulators for approval prior to construction. As previously stated in the GNWT's earlier response to the comment, monitoring of the mitigation measures will be conducted to ensure they are operating as planned and corrective measures taken if required. Additional site-specific mitigation may be applied based on recommendations by the environmental monitor, or a qualified aquatic environmental specialist depending on existing conditions at the time of construction.
10	Response to LKFN Comment #33	Given the lack of robust baseline sampling, LKFN agrees that the precautionary principle should be applied and that culverts should be sized to accommodate the swim speeds of species that are potentially present. This should be applied for all crossings.		The GNWT is of the opinion that fish and fish habitat and hydrotechnical assessments that have been and will be completed are appropriate, and that the design approach, as based on applicable guidelines, is protective of fish species potentially present. If fish species are not known for a watercourse or if the list of fish species in a watercourse cannot be determined, fish passage requirements will be based on the list of potential fish species which may occur based on professional judgement (using habitat information, stream size, and position in watershed) as well as the precautionary principle.
11	General Comment	In addition to what is listed above, there are several technical concerns that LKFN has identified that - given the current state of the project - LKFN is currently unable to assess whether its recommendations have been addressed.		
12	General Comment	As the largest village in the region, Fort Simpson plays a critical role for surrounding communities that will be connected by this road, if approved. This includes providing health and social services, groceries, among other necessities. Given the increase in transportation-related issues due to forest fires and climate change more broadly, Fort Simpson represents a critical dead end along this road. If individuals are evacuated to our community from surrounding areas, and our Liard ferry/winter road and/or flights are unable to operate, this could represent a serious issue. Through recent consultation and engagement with members of our Nation in relation to the Mackenzie Valley Highway Project, it has become clear that our members see the proposed project as	LKFN requests that Canada require the construction of the Liard River Bridge and the Mackenzie River Bridge simultaneously to the MVH as a condition of approval of the	Łíídlı́ Kúę First Nation (LKFN) states that construction of the Mackenzie Valley Highway (MVH) would be incomplete without the incorporation of bridges over the Liard River and Mackenzie River. According to LKFN, bridges in these locations would create the permanent access to the proposed MVH needed to relieve potential issues for transporting people and goods given the unreliability of ferries and winter roads. LKFN notes that a bridge across the Liard River would be the key mitigation and accommodation measure expected to address potential impacts from the MVH Project. LKFN has asked the Government of Canada to require construction of bridges across the Liard and Mackenzie Rivers as a condition

		<p>incomplete without the incorporation of bridges over the Liard River and Mackenzie River to create permanent, year-round access to the Mackenzie Valley Highway. The need for a Liard Bridge and a Mackenzie Bridge is imperative, and the approval of this road will underscore this necessity. LKFN is aware that the GNWT-INF has provided funding support in the past for bridge infrastructure and expects the GNWT-INF to make commitments to the Liard and Mackenzie Bridges as well.</p> <p>It should be further noted that our membership have clearly and unambiguously stated that a bridge over the Liard River is the key mitigation and accommodation measure we are interested in seeking for the potential impacts from the MVH Project on our Nation's ability to exercise our Treaty and Aboriginal rights. Our Nation shares the concerns of the numerous Indigenous Nations along the route of the MVH regarding the unreliability of ice roads and ferries to access our community. A bridge across the Liard River to Fort Simpson and across the Mackenzie River to make the MVH a year-round highway is a logical addition to the Project and will make the MVH much more useful. The commitment to constructing these bridges must be fulfilled without delaying the currently anticipated schedule for the Mackenzie Valley Highway project as currently proposed.</p>	<p>Mackenzie Valley Highway Environmental Assessment, and guarantee that Federal funding will be made available to enable the project to be constructed as soon as possible.</p>	<p>of approval of the MVH Project following Environmental Assessment (EA).</p> <p>The Government of Canada notes that civil infrastructure works within the Northwest Territories are the Government of the Northwest Territories' (GNWT) responsibility. The GNWT defines its own infrastructure priorities and applies for federal funding to support local projects in line with those priorities.</p> <p>The Government of Canada is committed to better understand the MVH Project's potential adverse effects on LKFN's Indigenous and Treaty rights. To this end, the Government of Canada encourages LKFN to fully participate in the Review Board's EA process. This process assists in examining the MVH Project's potential adverse effects in detail, and facilitates the Government of Canada's s. 35 duty to consult, and if necessary, accommodate.</p> <p>The Government of Canada understands that in response to requests from Fort Simpson in 2020/2021, the GNWT completed a Liard River Bridge Study. A Mackenzie River Study was also completed in 2022. These are feasibility/conceptual planning-level studies that provide information for future bridge crossing consideration. Recently, GNWT Minister of Infrastructure, Caroline Wawzonek noted that the GNWT is not considering the construction of bridges at ferry crossings at this time.</p> <p>Reference: Why are N.W.T. ferries having problems this summer? Part of it is bad timing, minister says CBC News</p> <p>Note: hyperlinks can be accessed through the pdf submitted to the Review Board's Public Registry.</p>
13	General	LKFN recently learned that archaeology, fish habitat research and	a. LKFN requests	Please see the attached document.

	Comment	bathymetric studies will be occurring in August 2024. LKFN was not notified about this work until the week prior; additionally, LKFN was not offered any opportunities to participate as Guardians or Monitors for this work. LKFN has extensive historical and ancestral uses within the proposed Study Area. It is a significant oversight for the proponent to not approach LKFN with any opportunities to participate in monitoring this work; LKFN will not be confident that the work has been done respectful of our Nation or to LKFN's standards. LKFN requires the GNWT-INF to offer opportunities for LKFN monitors during all fieldwork.	the GNWT-INF commit to hiring LKFN monitors for the entirety of project activities. b. LKFN requests clarity on how it will be notified on upcoming monitoring opportunities, including how much advanced notice will be provided to the Nation and who the key contacts are that the GNWT has from LKFN to provide this notice to.	
No.	Topic	Reviewer Preamble	Reviewer Request	Response
Pehdzeh Ki First Nation (PKFN; Wrigley) - Chief Jamie Moses				
1	PKFN's cover letter	PKFN's cover letter	PKFN's cover letter	
2	How Infrastructure will integrate PKFN's TK Information into MVH planning	The GNWT Department of Infrastructure ("Infrastructure") states confidence that the information cited in the "Technical Data Report – Cultural and Traditional Land Use" in the DAR, is "adequate for the purposes of this assessment", taking into account that this assertion is made without access to PKFN's project-specific Traditional Land and Resource Use studies.[1] Infrastructure has stated that further TK received from PKFN will be reviewed "against the results of the DAR and incorporated in	PKFN asks: 1. How will Infrastructure address the TDR's gaps and deficiencies?	1. The Government of Northwest Territories (GNWT) is supporting Traditional Land and Resource Use (TLRU) studies for Pehdzhé Kǰ First Nation's and Łíídlı̄Kúé First Nation. The GNWT looks forward to receiving Pehdzhé Kǰ First Nation's Traditional Land and Resource Use report and Łíídlı̄Kúé First Nation TLRU report. Once received, the GNWT will review the information and consider it in the context of the Project. The GNWT will prepare a supplemental report to be reviewed by

	<p>the regulatory process and project planning as appropriate”,[2]and that Infrastructure will “review the information and consider it in the context of the Project in a supplemental report”.[3]</p> <p>Infrastructure has not fully responded to questions on this point from the MVEIRB:</p> <p>Comment The developer is expecting Pehdzéh Kǰ and Łídlǰ Kúę íí First Nation to submit their Traditional Land and Resource Use studies, but there are no details on how the developer plans to incorporate the findings of the study into the DAR in the same manner as the other Traditional Land Use Studies.</p> <p>Recommendation Please provide an update on the Pehdzéh Kǰ, Łídlǰ Kúę and any other TLRUs and when they can be expected for consideration. When the GNWT receives these studies, how does it plan to meaningfully and respectfully integrate the findings into the effects assessment? Will the GNWT validate its correct use of the information with Indigenous groups?</p> <p>Response(s) The GNWT-INF provided capacity funding for Pehdzéh Kǰ First Nation and Łídlǰ Kúę First Nation to complete project-specific traditional land and resource use (TLRU) studies for the Project. No TLRU reports have been received from Pehdzéh Kǰ First Nation as of March 2024. Łídlǰ Kúę First Nation’s TLRU study report is anticipated in summer 2024.[4]</p> <p>[1] Developer’s Assessment Report at Section 11.7, p. 11.135. [2] Developer’s Assessment Report at Section 11.7, p. 11.135. [3] Developer’s Assessment Report at Section 3.2.2.3, p. 3-6. [4] Comment 20 and Response between Catherine Fairbairn on behalf of the MVEIRB, and GNWT-Infrastructure, Feb. 9, 2024.</p>	<p>2. How does Infrastructure plan to meaningfully integrate our traditional knowledge into the effects assessment?</p> <p>3. How will Infrastructure validate its correct use of our information with us?</p> <p>4. How will current timelines for the environmental assessment process allow for these steps to take place?</p>	<p>each First Nation for validation, prior to submission to Mackenzie Valley Environmental Impact Review Board (MVEIRB). The GNWT will incorporate feedback on the supplemental report received from Pehdzéh Kǰ First Nation and Łídlǰ Kúę First Nation, as applicable. As per Table 2.7 of the Developer’s Assessment Report (DAR), the GNWT is committed to ongoing engagement with Pehdzéh Kǰ First Nation and Łídlǰ Kúę First Nation and sharing of project documents, including supplemental reports, as applicable, with each First Nation.</p> <p>2. The GNWT will review the results of Pehdzéh Kǰ First Nation’s TLRU report against the conclusions of the DAR and create a supplemental report to be submitted to MVEIRB. The supplemental filing will focus on assessing TLRU, approved for sharing by Pehdzéh Kǰ First Nation relative to Project interactions to determine residual effects, and highlight those conclusions (if any) that deviate from the conclusions presented in the DAR.</p> <p>3. The GNWT will share the supplemental report with Pehdzéh Kǰ First Nation and Łídlǰ Kúę First Nation respectively for review and validation prior to submission to MVEIRB. The review process (how the document will be shared, duration of review, incorporation of feedback) will be determined through engagement between the GNWT and Pehdzéh Kǰ First Nation and Łídlǰ Kúę First Nation respectively.</p> <p>4. A DAR addendum is expected to be submitted in early Q1 2025, followed by pre-hearing conferences/public hearings between Q2 and Q3 2025. At that point, the public record will close as the Project moves into the decision phase. If received in advance of filing, Pehdzéh Kǰ First Nation’s Traditional TLRU report and or Łídlǰ Kúę First Nation TLRU report will be integrated into a supplemental filing as part of the addendum. As per Table 2.7 of the DAR, the GNWT is</p>
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		MVEIRB Online Registry System. Accessed online May 15, 2024: https://new.onlinereviewssystem.ca/review/A2062718-6D85-EE11-8925-0022483C4492		committed to ongoing engagement with Pehdzéh Kǰ First Nation and ŁíídlǰKúé First Nation and sharing of project documents, including supplemental filings with each Nation. As of the time of submission of this response, the TLRU reports have not yet been made available to the GNWT.
No.	Topic	Reviewer Preamble	Reviewer Request	Response
Fort Norman Metis Nation Local #60 Land Corporation - Judith Wright-Bird				
1	Construction Schedule	FNMC appreciates and supports the optimal schedule presented by GNWT in MVEIRB-1. In particular, FNMC supports construction advancing concurrently from Norman Wells to Tulita as well as from Tulita to Norman Wells; Wrigley to Tulita as well as Tulita to Wrigley. In MVEIRB-1, the GNWT has stated a number of assumptions.	<p>1. What is the GNWT doing to prioritize an expedited schedule for the Project? Specifically, what is the current status of:</p> <p>(a) Design for construction for the entire alignment?</p> <p>(b) Securing land tenure?</p> <p>(i) In answering this question, please confirm the status of discussions with Tulita District Land Corporation (TDLC) to identify and</p>	Please see the attached document.

			<p>obtain tenure for the current road alignment over Sahtu Lands listed in the Sahtu Dene and Metis Comprehensive Land Claim Agreement. If GNWT has not yet approached TDLC to commence this process, when does it expect to do so?</p> <p>(c) Funding for regulatory authorizations and construction?</p> <p>(d) Applications for regulatory authorizations in anticipation of a positive EA recommendation?</p> <p>(e) Procurement?</p> <p>(i) In answering this question,</p>	
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			<p>please comment specifically on whether the GNWT will commit to tendering the project in smaller packages so that local contractors can benefit. This would seem especially feasible under the optimal scenario with concurrent construction from multiple headings. Is there an assumption that the entire project would need to be tendered to one single contractor, and why?</p> <p>2. For each of the answers above, what are the specific hurdles the GNWT is facing,</p>	
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			<p>and what concrete measures can be taken to overcome those hurdles?</p> <p>3. Under the optimal scenario, where would construction camps be located? Would there be a camp north of the Great Bear River to advance the road work north of Tulita?</p> <p>4. There is an assumption that the initial construction period of 20 years would maximize community benefits. Where does that assumption come from, and is the GNWT willing to revisit that</p>	
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			<p>assumption? Doesn't the benefit of building the highway sooner far outweigh the benefits from a staggered construction period? Particularly when there is considerable uncertainty about what the environmental conditions will be in 20 years?</p>	
2	Socio-Economic Related Mitigation	<p>FNMC appreciates the proposed Socio-economic related mitigation presentation provided by GNWT and DPRA to the community in May 2024. FNMC looks forward to further information on this as the diagrams were confusing and poorly understood by the community.</p>	<p>1. Who will be on the Mackenzie Valley Highway Corridor Working Group. Is there a draft list of participants?</p> <p>2. Different communities along the route will be affected differently. The proposed working groups appear to be</p>	<p>Please see the attached document.</p>

			<p>regional rather than specific. Will there be a specific working group for Tulita, specifically with respect to social monitoring?</p> <p>3. Who will be responsible for ensuring the mitigation measures identified by the working groups will be implemented? And who will provide funding?</p> <p>(a) Arguably, the GNWT has not provided enough support for drug and alcohol and mental health challenges in Tulita to date. What commitments can the GNWT make to mitigate these challenges in the future, when they are</p>	
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			<p>going to be exacerbated by the project?</p> <p>4. Has the disruption to the barges in recent years been considered in terms of its impact on the cost of living in the communities? Does the DAR give sufficient weight to the positive impacts on cost of living in the communities from the project? Is that positive impact considered a mitigation measure in and of itself?</p>	
3	Impact on Cabins	A number of FNMC members have cabins along the existing winter road right of way that could be affected by the project.	<p>1. What is the process for identifying cabins along the proposed alignment?</p> <p>2. Is there</p>	<p>1. What is the process for identifying cabins along the proposed alignment?</p> <p>2. Is there potential to refine the proposed alignment in response to cabin identification?</p> <p>3. Will the GNWT offer to move cabins that cannot be avoided or otherwise provide compensation?</p>

			<p>potential to refine the proposed alignment in response to cabin identification?</p> <p>3. Will the GNWT offer to move cabins that cannot be avoided or otherwise provide compensation?</p>	
No.	Topic	Reviewer Preamble	Reviewer Request	Response
Canadian Northern Economic Development Agency (CanNor) - Chantal Grey				
1	<p>HC-01: Assessment of Noise Impacts and Noise Complaint Resolution- DAR Vol. 2, Sec. 9.5.7.2; DAR Vol. 3, Sec. 13.0; DAR Vol. 4, Sec. 23.5.3; Response to DAR Review Comments AKDFN-11, HC-2, HC-3, HC-4,</p>	<p>The response to ADKFN-11 reports that Long-Term Community Annoyance “only applies to receptors within communities and therefore would not apply to other locations...”. HC would like to clarify that percent highly annoyed (%HA) applies to all human receptors exposed to Project-related noise (construction and operation of the completed highway) that is of at least one year in duration at the receptor location. However, provided that R1 and R2 are the most affected receptor locations, evaluating long-term annoyance and sleep disturbance at these locations would be consistent with HC guidance.</p> <p>Project noise from construction that is less than one year in duration at any given receptor should be assessed for potential sleep disturbance and complaints. Noise concerns from short-term exposures can be mitigated through best practices and HC acknowledges the mitigations described in the DAR (Volume 2, Section 9.5.7.2). For the construction of a highway that is this</p>	<p>HC recommends: Public communication prior to any particularly noisy activity. Developing a noise complaint resolution plan that includes the following information:</p> <p>The method(s) for receiving complaints (e.g. website,</p>	<p>Long-Term Community Annoyance assessment does not apply to the Project construction activities because the construction site and the staging/mobilization sites are mobile (i.e., not fixed for the duration of construction) and are not expected to remain near receptors (within 5 km) for more than several weeks.</p> <p>Nighttime sleep disturbance assessment does not apply for the construction activities as the work is planned to be conducted during daytime periods only.</p> <p>The Government of the Northwest Territories (GNWT) has committed to developing a noise complaint resolution plan, as previously indicated in the GNWT’s response to ORS CanNor-64 (HC-4). The plan will include the elements listed in the CanNor-64 response, and will consider the information listed above.</p>

	and HC-10	extensive, taking several years to complete, strong community consultation will be key to mitigating project-noise related concerns with individuals adversely impacted by project noise. Although HC does not have expertise in assessing noise impacts on wildlife, the community has expressed concerns in this area. These concerns may lead to heightened sensitivity toward project noise overall. In addition, public communication prior to elevated noise levels has been shown to be successful in reducing complaints.	telephone, etc.) and response time; The time of complaint and activities that were being undertaken at the time so that there is an understanding of what noise sources were considered problematic; Weather conditions as they can influence as they can influence sound propagation and impact the validity of noise monitoring.	<p>Additionally, the mitigation measures described in Chapter 13 (Table 13.5 and Section 13.4.2.2) will be considered as part of the noise complaint resolution plan, specifically those that pertain to community involvement as listed below.</p> <ul style="list-style-type: none"> • The GNWT will develop a system to track complaints and responses to manage and mitigate feedback from the public regarding noise concerns. • Communities will be informed of time periods and characteristics of noise that may exceed the recommended noise threshold. • The GNWT will engage with communities to inform them of the activities and the noise sources that will occur prior to construction.
2	HC-02: Methodology for Assessing Project Effects on Air Quality- DAR Vol. 3, Sec. 12.0, 12.4; Response to DAR Review Comments HC-2, HC-5, HC-6,	HC does not support the methodology used to assess the Project's effects on air quality, as described in the DAR (Volume 3, Section 12.0) and the Proponent's responses to HC-5 and HC-6. HC does not agree with the statement that the National Pollution Release Inventory (NPRI) reporting thresholds are set at "the level(s) at which the substance begin to pose a risk to the environment or to health" (Volume 3, Section 12.1.1.1). Instead, the NPRI thresholds are for reporting requirements and they should not be considered as emission thresholds below which no health effects exist. As indicated on the NPRI website (https://www.canada.ca/en/environment-climate-	HC recommends: Using a receptor-based assessment that follows HC's Guidance for Evaluating Human Health Effects in Impact Assessment: Air	Please see the attached document.

	and HC-10	<p>change/services/national-pollutant-release-inventory/using-interpreting-data.html), “NPRI data is not enough to assess the risks and impacts posed by pollution to the environment and human health.” Additional information, such as inherent toxicity, physical and chemical properties, amount, timing, nature and level of exposure are required to assess potential health risks. As described in HC-6, the rationale for this methodology includes the assumption that emissions of contaminants of potential concern (COPCs) are expected to disperse or settle within the local assessment area (1 km). Dust particles may settle within a 1-km buffer but fine particulate matter (PM2.5) and precursor pollutants can travel large distances in the atmosphere and affect receptors within and beyond this 1 km buffer distance. Additionally, the distance traveled by dust depends on various factors (e.g., turbulence, wind, dust properties). Given the transient nature (e.g., mobile sources over temporary periods of time) of this Project and the varying spatial and temporal land use by humans (e.g., intermittent harvesting activities), HC recommends use of dispersion modelling to assess potential health effects with a receptor-based approach at key locations along the route where receptors are the closest. HC relies on the expertise of ECCC in the areas of emissions, dispersion, and atmospheric modelling.</p>	<p>Quality.</p> <p>Comparing against conservative health-based air quality criteria, including the Canadian Ambient Air Quality Standards (CAAQS), when evaluating the predicted COPC concentrations.</p>	
3	<p>HC-03: Sources of Air Contaminand Emissions- DAR Vol. 3, Sec. 12.0; Response to DAR Review Comment HC-5</p>	<p>The response to HC-5 states that PM2.5 and PM10 are only considered in the context of vehicle usage (e.g., diesel particulate matter). The exclusion of fugitive dust may underestimate the potential health impacts associated with Project-related activities and should be included in the determination of Project effects. In order to fully assess the potential health risks from the Project’s expected changes to air quality, it is best practice that all sources of emissions be considered.</p>	<p>HC recommends:</p> <p>Considering all sources of emissions, for each COPC, including Project-related processes, on-site vehicle usage, and fugitive emissions, or</p>	<p>Please see the attached document.</p>

			Providing additional evidence-based rationale to justify excluding any emissions, or specific COPCs, from further assessment.	
4	HC-04:Air Quality Monitoring for Implementation of Mitigation Measures- DAR Vol. 3, Sec. 12.0; DAR App. 12A; Response to DAR Review Comment HC-6 and HC-7	<p>The response to HC-7 states that "mitigation and monitoring measures associated with air quality have been identified, based on visual monitoring for dust plumes." PM10 and PM2.5, the latter being of particular concern for human health, are invisible and only tools such as atmospheric dispersion modelling and/or monitoring stations can provide the information required to assess potential risks to human health.</p> <p>HC's Guidance for Evaluating Human Health Effects in Impact Assessment- Air Quality (p.29) states, "The need for corrective actions for on-site emission management or implementation of additional control measures can be determined by comparing monitoring results to trigger levels." Project-specific trigger levels should be informed by reference guideline values (e.g. CAAQS), pre-project baseline concentrations, atmospheric dispersion modeling results, and the analysis of local air quality in relation to the air zone management levels for each pollutant. As mentioned in the Proponent's response to HC-6, and supported by the Project falling in the yellow CAAQS management level, the Project is located in a relatively pristine environment. Other considerations such as public complaints, wind speed, visual observations can also trigger the implementation of mitigation measures.</p>	HC recommends that air quality monitoring for COPCs, specifically PM2.5, and the development of Project-specific trigger levels, be used to inform the implementation of appropriate mitigation measures. Monitoring should be performed where the closest receptors to the Project are located and could be informed by the results of atmospheric	Please refer to the Government of Northwest Territories' response to CanNor IR #02, which responds to this request.

			dispersion modelling.	
5	<p>NRCan-01: Hazards Associated with Icing (aufeis)- ToR 5.1.3, 7.3.4; DAR Vo. 3, App. 14A, Sec. 4.6.4; App. 15B, Sec. 4.2.3.4</p>	<p>Accumulations of ice related to aufeis or icing can cause hazards to road travel, block culverts and also lead to accumulation of water on the surface in the spring with impacts to the ground thermal regime. Information on icing occurrence is required to adequately assess potential impacts of the environment on the Project and impacts of the Project on the environment. Icings have been observed to occur in the Mackenzie Valley including those near Norman Wells on the winter road resulting from water flowing from Kee scarp through a talik (e.g. Taylor et al. 1998). The Proponent indicates that there is no spatial data on icing occurrence along the highway route. A study published by Crites et al. (2020) mapped icing occurrence in the Mackenzie Valley and provides a digital database.</p> <p>Reference: Taylor AE, Nixon M, Eley J, Burgess M, Egginton P (1998) Effects of atmospheric inversions on ground surface temperatures and discontinuous permafrost, Norman Wells, Mackenzie valley, Canada. In: Lewkowicz AG, Allard M (eds) Proceedings of the 7th International Conference on Permafrost. Collection Nordicana, Yellowknife, 1043-1047.</p> <p>Crites H, Kokelj SV, Lacelle D (2020) Icings and groundwater conditions in permafrost catchments of northwestern Canada. Scientific Reports 10:3283</p>	<p>NRCan requests from the Proponent:</p> <p>Please clarify whether existing mapping of icing occurrence has been incorporated into project design and environmental assessment</p> <p>Please provide information on any plans to map icing occurrence as project design advances.</p>	<p>The Government of Northwest Territories (GNWT) appreciates the reference information provided by Canadian Northern Economic Development Agency, and will add it to the Project-specific knowledge base.</p> <p>Local knowledge of overflow/icing locations along the Mackenzie Valley Winter Road has been collected through Project-specific engagement since 2010. These are communicated as descriptive locations (e.g., “north of Steep Creek”), and as georeferenced locations provided in private comments on the GNWT’s interactive map tool included on the “Have Your Say” page (Mackenzie Valley Highway Project Have Your Say - Government of Northwest Territories (nwt-tno.ca)). Additionally, cross-highway surface and groundwater flow is anticipated along much of the route due to its setting along the general regional drainage between the Norman Wells and Franklin Ranges, and the Mackenzie River (see the Conceptual Groundwater Model in the Hydrogeology Technical Data Report [Developer’s Assessment Report Volume 3, Appendix 15B, Section 5]). Icing of culverts is also expected. Knowing the locations of existing icings and overflow through engagement will help to focus future field studies and detailed design.</p> <p>Both cross-slope flow and icing will be factored into the detailed Project design, as discussed in the GNWT’s response to MVEIRB IR#71.</p>
6	<p>NRCan-02: Permafrost Conditions in the Project Area- Geotechnical and Thermal</p>	<p>The Proponent has utilized the extensive data that are available (including Geological Survey of Canada reports) for the Mackenzie Valley in its description of baseline permafrost conditions and assessment of environmental assessment (Vol 3 sec. 14, App 14A). The Proponent has indicated that it has drilled a limited number of boreholes within the project region that appear to be located near infrastructure already constructed or under construction (e.g.</p>	<p>NRCan requests from the Proponent:</p> <p>Please clarify if any additional geotechnical</p>	<p>Please see the attached documents.</p>

	<p>Conditions-ToR 5.1 (5.1.1), 7.1, 7.3.1, 8; DAR Vol. 3, Sec. 14 (14.2, 14.4, 14.7), App. 14A (Sec. 4, 5, App. A, B), Vol. 5 (Sec. 9)</p>	<p>Prohibition Creek Access Road) rather than the infrastructure considered in this assessment. There is also limited thermal information (&lt; 1 year) available from these new boreholes and not yet adequate to describe baseline conditions. NRCan realizes that more site-specific information is normally acquired as design advances. However, any additional information the Proponent has collected since the investigations conducted by Tetra Tech in 2020 would facilitate understanding of the baseline permafrost conditions in the project area.</p>	<p>investigations (including borehole drilling) have been conducted in the project area since the investigations conducted by Tetra Tech in 2020 and provide details of any additional investigations conducted (e.g. geotechnical, thermal data).</p> <p>Provide any additional information regarding ground temperatures collected since 2020 from the boreholes instrumented by Tetra Tech during the 2020 investigations.</p>	
7	<p>NRCan-03: Assessment of Long-Term Changes in Permafrost</p>	<p>Knowledge of how permafrost conditions will change over time due to infrastructure construction and operation, climate change and other environmental disturbances is essential to inform project design and assessment of impacts of the project on the environment and also the impacts of the environment on the</p>	<p>Please provide clarification on whether any thermal modelling has</p>	<p>The Government of the Northwest Territories has not conducted any Project-specific thermal modelling for the Project, and are not aware of any thermal modelling conducted by others in the Regional Assessment Area. The Tetra Tech reports referenced in the Technical Data Report</p>

	<p>Condition and Associated Environmental Effects- ToR 5.1 (5.1.1, 5.1.2), 7, 8; DAR Vol. 3 (sec. 14) App. 12A, 14A, Vol. 4 (Sec. 24, 26), App. 24A; Response to MVEIRB IR#2-Updated Climate Change Risk Assessment</p>	<p>project. The expected changes in permafrost conditions including changes in thermal conditions has been assessed at a high level in the DAR. Similarly, a climate change risk assessment has been done at a high level with some aspects based on global or national scale assessments (including some inappropriate interpretation of results). Thermal modelling is usually done to quantitatively assess the evolution of the permafrost thermal regime over the project lifetime. However, this type of thermal analysis does not appear to be presented in the DAR. It is unclear if this type of analysis is included in the reports submitted to the Proponent by Tetra Tech in support of design of the Mount Gaudet Access Road and the Prohibition Creek Access Road, as these reports have not been provided. NRCan understands that more detailed site-specific thermal analysis is usually completed as design advances. However, information on any thermal modelling completed by the Proponent would be useful to NRCan's review of the DAR to better understand the anticipated changes in permafrost conditions and associated environmental impacts.</p> <p>Reference for Tetra Tech reports cited in DAR: Tetra Tech. 2020. Mount Gaudet Access Road Thermal Assessment Report. MVWR km 687 to 708, Northwest Territories. Issued for Review. Report prepared for the Government of the Northwest Territories, Department of Infrastructure by Tetra Tech Canada Inc. November 24, 2020. Tetra Tech File: 704-ENG.YARC03354-02. Tetra Tech. 2020. Prohibition Creek Access Road Thermal Assessment Report. MVWR km 995.3 to km 1009.3. Northwest Territories. Issued for Review. Report prepared for the Government of the Northwest Territories, Department of Infrastructure by Tetra Tech Canada Inc. November 24, 2020. Tetra Tech File: 704-ENG.YARC03354-02.</p>	<p>been done to assess the evolution of permafrost conditions and inform project design and assessment of environmental effects. If such analysis has been conducted, please provide any information (including reports) on the results of this analysis.</p>	<p>for Terrain, Soils, and Permafrost (Appendix 14A) describe the soil and thermal conditions observed along the Mount Gaudet Access Road (Tetra Tech, 2021a) and the Prohibition Creek Access Road (Tetra Tech, 2021b) during the 2020 geotechnical investigation programs.</p> <p>Thermal modelling may be considered for specific sections of the Project highway alignment where thawsensitive, ice-rich permafrost soils are identified. Data from thermal modelling studies, if undertaken, will inform the detailed design of the road embankment structure for specific sections of the Project. The GNWT does not expect to perform thermal modelling for the entire highway alignment.</p>
8	<p>NRCan-04: Slope Stability in the Project Area and Project Design-</p>	<p>Slope instability related to ground warming has been discussed in the DAR and landslides have been identified on the terrain maps provided in App. 14A (App. B). Creep (gradual downslope movement) has been observed to occur in warm permafrost on slopes along the Norman Wells pipeline and these movements</p>	<p>NRCan request from the Proponent: Please provide</p>	<p>Slope stability including creep in warm permafrost will be considered in the design of the roadway embankment and watercourse crossings. As the final engineering designs for the road and crossings have not been completed yet, we are unable to provide details about how creep and warm</p>

	<p>ToR 5.1, 7.1, 7.3.1, 8; DAR Vol. 3 (Sec. 14), App. 14A (inc. App B), Vol. 4 (Sec. 23, 24), Vol. 5</p>	<p>have been monitored with slope inclinometers by Enbridge. NRCan notes that while there are a few references to creep in the DAR it is unclear whether it has been considered in the design of the approaches to water crossings and assessment of impacts on bridge abutments. It is not clear from the monitoring plans submitted whether instrumentation such as slope inclinometers will be installed to inform the need for mitigation at the water crossing approaches and bridge abutments. Any additional information regarding consideration of creep in the project design and assessment of effects of the environment on the project would help inform NRCan's review of the DAR.</p>	<p>clarification regarding how creep on warm permafrost slopes was considered in design of water crossing approaches and assessment of the effect of the environment on bridge abutments.</p> <p>Please clarify if instrumentation to monitor creep, such as slope inclinometers, will be installed as part of environmental monitoring and management plans in order to determine the need for mitigation at water crossing approaches.</p>	<p>permafrost information has been considered. The engineering design will incorporate slope stability information along the route including near crossings.</p> <p>Instrumentation to monitor creep, if required to ensure the integrity of the infrastructure, will be installed during construction, as experiences on the Tłıchq Highway have shown that instrumentation installed prior to construction within or near the Project footprint is subject to being damaged.</p>
9	<p>NRCan-05: Responsible Authority/Minister- DAR Vol.</p>	<p>The Proponent has identified that the Project will require the manufacturing and storage of explosives. NRCan, through its role in the administration of the Explosives Act, may exercise a power or perform a duty or function that would enable the project to</p>	<p>If the Project involves the manufacturing or storage of</p>	<p>It is not anticipated that explosives will be manufactured on site. It is more likely that pre-packaged ammonium-nitrate-fuel-oil (ANFO) emulsion explosives will be used, consistent with other Government of Northwest Territories (GNWT)</p>

	1, Sec. 6.1, Table 6.1	proceed.	explosives, please provide details of the type and quantity of explosives to be stored, as well as the specific locations of the explosives facilities.	<p>highway and quarry development projects. Pre-packaged explosives are likely to be stored at one or more quarries or other designated areas, as was done during the construction of the Prohibition Creek Access Road (see Edie Lake Quarry – Quarry Operations Plan (https://registry.mvlwb.ca/Documents/S20E-005/S20E-005%20-%20PCAR%20Quarry%20Operations%20Plan%20Ver%201-%20Sep%2023_20.pdf)).</p> <p>The locations of explosives storage have not yet been determined. These will be determined by the contractor selected by the GNWT to construct the Project. The assessment assumes that explosives will be transported to quarries along constructed portions of the Project and quarry access roads, and that some quantity of explosives may be stored at the quarry during construction and/or operation of the quarry (see Developer’s Assessment Report, Section 5.4.5.3).</p> <p>An Explosives Management Plan will be developed for the Project prior to construction to support regulatory authorizations.</p>
10	DFO-01: Attachment Not Provided- Response to DAR Review Comment DFO-27	The Proponent mentioned in their response that a memo entitled “Mackenzie Valley Highway Alignment, Sahtu Region – Fish Assessments by Tetra Tech” dated December 2021 was attached to their response (Attachment CANNOR-45A). However, no attachment was provided.	Proponent to please provide memo titled “Mackenzie Valley Highway Alignment, Sahtu Region – Fish Assessments by Tetra Tech” dated December 2021.	The requested attachment has been provided as part of the response package. Note it was misreferenced in the DAR and the correct reference is “Mackenzie Valley Highway Alignment, Sahtu Region – Fish Assessments by Tetra Tech” dated January 2022.
11	DFO-02:	Photographs are not available for all proposed culvert crossings	As part of the	The Government of Northwest Territories (GNWT) is currently

	<p>Photographs of Proposed Culvert Crossings- Response to DAR Review Comments DFO-27 and - 28</p>	<p>and photographs available are not compiled in one document. This makes it more difficult for the reviewer to access and evaluate information. Photographs of each crossing will be requested to be compiled - in one document that is clear, concise, and follows either a chronological or spatial logic for ease of review - as part of the Fisheries Act Authorization application.</p>	<p>Fisheries Act Authorization application, photographs of each crossing will be requested and shall be compiled in one document and in an orderly fashion. DFO recommends the Proponent gather all photographs available into one document, and plan to collect photographs at the crossings where they are currently unavailable.</p>	<p>undertaking a supplementary field program, which includes the collection of physical data (e.g., wetted width, substrate composition) and photographs of watercourse crossings along the Project alignment. This data will be used to inform the detailed design of the Project, which will be prepared following the environmental assessment.</p> <p>The GNWT will compile the supplementary field data, in addition to the information provided in the Developer's Assessment Report, into a single supporting document for DFO as part of their review under the Fisheries Act following the environmental assessment and during the upcoming regulatory phase of the Project. The GNWT looks forward to further discussing how the requirements of the Fisheries Act apply to the Project.</p>
12	<p>DFO-03: Crossing Summary Tables- Response to DAR Review Comments DFO-18, -28, and -29</p>	<p>To assist with the review, DFO requested the Proponent resubmit Appendix 17A Tables 4.2 and 4.3 with additional information, such as channel width, wetted width, the size/number of culverts needed per crossing, and the year/month the fish assessment was conducted. The Proponent responded that DFO should refer to habitat assessment cards in Appendix 17A. Compiling this information in tables will help parties understand the potential impacts at water crossings more efficiently. Searching through multiple pages of appendices for this specific information is not efficient. Additional details, such as stream type and gradient, would also aid DFO in their review.</p>	<p>To help with the review, DFO requests the Proponent resubmit Appendix 17A Tables 4.2 and 4.3 with the following additional information for</p>	<p>Information about watercourse crossings will be used to inform the detailed design phase of the Project, which will follow the environmental assessment. Supplementary field data, as applicable, in addition to the existing information provided in the Developer's Assessment Report, will be compiled into a single document. This compiled document will be provided to Fisheries and Oceans Canada as part of their review under the Fisheries Act during the regulatory phase of the Project. At proposed watercourse crossings, physical data (e.g., channel width, wetted width, fish species presence, in-situ water quality) and photographs will be</p>

			<p>each crossing: Specific ID Stream type Channel width Wetted width Gradient Estimated number, size, and type of culverts Year/month the fish assessment was conducted Fish species (confirmed and potential) Reason why crossings were considered unlikely to be non-fish bearing (i.e., downstream barrier to fish passage.) Connecting waterbodies Availability of photographs (and reference to photograph # or page #, if applicable)</p>	<p>collected and available for review. Thus far, the information has been presented to support the environmental assessment, not regulatory authorizations</p>
13	DFO-04: Lessons Learned from	DFO previously requested that the Proponent provide information (e.g., literature or lessons-learned from other roads) on the effectiveness of the use of geotextile membranes at culverts to	Based on the Proponent's experience from	Please see the attached document.

<p>Inuvik to Tuktoyaktuk Highway-Crossings-Response to DAR Review Comment DFO-3</p>	<p>maintain structural integrity, thus preventing fish passage issues, and provide information on whether other types of isolation (e.g., polystyrene) were considered and why they were not chosen. The Proponent did not respond to the specific questions.</p> <p>To elaborate on our request, we would like to add that the Proponent encountered issues related to fish passage and habitat on other projects such as the Inuvik to Tuktoyaktuk Highway, including:</p> <ul style="list-style-type: none"> Perched culverts due to lack of embedment and shifting of Permafrost impeding fish passage Inadequate culvert sizes causing yearly (at freshnet) road wash outs and sedimentation into fish bearing waters In-water works not conducted according to plans approved under Water Licence. (e.g. Gunghi Creek) Inadequate responses to erosion and sedimentation events leading to enforcement actions by DFO 	<p>the construction of the Inuvik to Tuktoyaktuk Highway, please provide design considerations, modifications to the construction techniques, mitigation measures and responses that will be implemented to avoid similar issues from occurring at the MVH crossings. Information should focus on:</p> <ul style="list-style-type: none"> Effectiveness of the use of geotextile membranes at culverts to maintain structural integrity, thus preventing fish passage issues Effectiveness of water management and erosion and sediment control measures and 	
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			responses during sedimentation events Culvert sizing	
14	DFO-05: Baseline Fish Sampling- DAR Vol. 3, Sec. 17 and App. 17A	DFO understands the GNWT has taken a precautionary approach by assuming which stream crossings are fish-bearing and the fish species that may be present in a stream crossed by the Project. However, fish sampling was limited due to freezing conditions, and observations were only carried in the fall. Conducting sampling at different times of the year is essential for capturing the full spectrum of fish presence and habitat use. DFO is of the opinion that the baseline information collected is incomplete and sometimes outdated (2004, 2011). Although culverts will be designed to allow for fish passage, having baseline data provides a reference point for assessing the effectiveness of the culverts and any unforeseen negative effects of the road on fish populations, and making necessary adjustments. Additional baseline data would be valuable scientific information that would inform fisheries management.	The Proponent to work with DFO in identifying higher risks crossings, identifying specific baseline data gaps at these crossings, and developing a Baseline Monitoring Plan to supplement the existing baseline data. DFO will have a better understanding of any potential data gaps after receiving responses to IR DFO-02 and DFO-03.	The Government of Northwest Territories (GNWT) has undertaken a supplementary fisheries field program which is currently ongoing. Information about fish species presence and fish habitat potential at watercourse crossings will continue to be collected in order to inform the detailed design phase of the Project, which will follow completion of the environmental assessment. The fish species presence information and collected baseline data will be compiled into a single report and submitted to Fisheries and Oceans Canada (DFO) as part of their review under the Fisheries Act. This compiled information will support the detailed design of each crossing structure to confirm the crossings are designed to maintain flow and fish passage past crossing locations. The detailed design phase will follow completion of the environmental assessment. The GNWT looks forward to further discussing with DFO how the requirements of the Fisheries Act apply to the Project.
15	DFO-06: Fisheries Monitoring at Crossings- DAR Vol. 3, Sec. 17.9	As per the DAR, monitoring at the crossings will include routine periodic inspection of culverts to determine if they are functioning as per design (e.g., allow fish passage) and for evidence of erosion and sedimentation. However, despite the design intentions, flaws in culvert construction and maintenance may compromise a culvert's structural integrity and impede fish passage. DFO believes that additional field monitoring should be conducted in high-risk	DFO recommends post-construction field monitoring be conducted at high-risk	Information about proposed watercourse crossings will continue to be collected by the Government of Northwest Territories (GNWT) to inform the detailed design phase of the Project, which will follow completion of the environmental assessment. This information includes baseline data and fish species presence information, and site-specific hydrotechnical data which will be used to inform the specific hydrotechnical

		<p>streams (e.g., where sensitive migratory species such as Bull Trout and Arctic Grayling may be present, such as Four Mile Creek, Twelve Mile Creek, Prohibition Creek) to demonstrate that the culverts do not impede fish passage.</p>	<p>crossings (e.g., in streams where sensitive migratory species such as Bull Trout and Arctic Grayling may be present, such as Four Mile Creek, Twelve Mile Creek, Prohibition Creek) to demonstrate that the culverts do not impede fish passage. Field monitoring may include: Velocity monitoring at the culvert to validate model prediction Fish sampling upstream of the culverts</p> <p>DFO recommends the Proponent develop a Conceptual Post-Construction Fish Monitoring</p>	<p>design for crossing structures. The crossings will be designed to maintain flow and fish passage past the crossing structures. The GNWT will develop a post-construction monitoring plan and submit the plan to Fisheries and Oceans Canada for review as part of the Fisheries Act regulatory review process, following completion of the environmental assessment.</p> <p>The GNWT notes that there are existing watercourse crossings (i.e., bridges, culverts) across large watercourses along the current Mackenzie Valley Winter Road alignment, with the exception of the Great Bear River. These existing watercourse crossings are listed in Table 5.8 of the Developer's Assessment Report and identified in Appendix 5A. These existing watercourse crossings, including the Great Bear River crossing, are not part of this Project; however, the Project will tie into these existing crossings. Where practical and within the Project footprint, the post-construction monitoring plan will consider where the Project ties into existing crossings.</p>
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			<p>Plan, as part of the Fish and Fish Habitat Protection Plan, to verify whether the culverts allow fish passage throughout the open-water season. The Plan may include:</p> <ul style="list-style-type: none">Summary of pre-construction conditionsSampling scheduleDescription of success criteria and associated measures of successMonitoring methods, including locations, target species, and data to be collected.Description of data analysis to be performedReporting scheduleThresholds for acceptable	
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			performance Response Plans for addressing any issue identified	
16	DFO-07: Culvert Crossings in Large Watercourses- Dar Vol. 3, Sec. 17 and App. 17A	At the time of assessment, the following crossings had large channel widths, likely due to the presence of beaver dams: Site 919.9 Unnamed Watercourse (37m wide) Site 820.7 Unnames Watercourse (15.5m wide, but 95m to 100m wide downstream) Site 891.4 Unnamed Watercourse (12.5m wide) It is unclear how culvert crossings will be constructed in those locations	The Proponent to provide examples, accompanied by photographs, of culvert crossings that have been constructed by the Proponent in wetlands (streams with large, wetted widths). If the Proponent has no such examples, they can provide best practices that would be applied in these situations.	Please see the attached document.
17	DFO-08: Culvert Crosses- Type of Culverts- DAR Vol. 3, Sec. 17	The proponent did not specify which type of culverts would be used at different crossings. DFO encourages the use of open bottom culverts or embedded oversized arched culverts instead of circular culverts as they allow maintaining a more natural stream bed and can accommodate higher flow volumes.	DFO recommends the Proponent install open bottom or embedded oversized arched culverts at fish bearing crossings.	The Government of Northwest Territories (GNWT) understands the reasons for Fisheries and Oceans Canada's preference for arch culverts or embedded oversized culverts. The GNWT will consider this recommendation during the detailed design of watercourse crossings that are at fish bearing streams. As noted in the GNWT's response to CanNor Information Request#13, the GNWT has been developing updated design guidelines for large-diameter culverts, which will address design requirements to maintain adequate fish passage, including considerations for embedment, camber,

				permafrost, and construction practices.
18	DFO-09: Culvert Verses Bridge Crossings Rationale- Response to DAR Review Comment DFO-14	<p>DFO requested the Proponent provide a rationale on why bridges are not proposed to be installed, especially in larger watercourses. The Proponent responded that “bridges impose many more constraints on road geometry than culverts, such as: road width, longitudinal and transverse slopes and corner radius. These constraints negatively affect road safety for bridges more than for culverts. Therefore, culvert crossings are often safer than bridge crossings for the type of highway proposed”.</p> <p>DFO acknowledges the response and the importance of safety when building new roads. However, bridges can facilitate the natural flow of water and have minimal impact on the streambed and surrounding riparian zone, thereby limiting their impact compared to culverts. Additionally, bridges can reduce the risk of flooding, as observed on the Inuvik to Tuktoyaktuk Highway. DFO encourages the Proponent to consider installing bridges at crossings where sensitive migratory species such as Bull Trout and Arctic Grayling may be present (e.g., Four Mile Creek, Twelve Mile Creek, Prohibition Creek), provided it does not create safety issues.</p>	The Proponent should demonstrate that installing a bridge at crossings where sensitive migratory species may be present (such as Four Mile Creek, Twelve Mile Creek, Prohibition Creek) would negatively affect road safety.	Please see the attached document.
19	DFO-10: Riparian Vegetation in Bull Trout Habitat- Response to DAR Review Comment DFO-17	<p>In their response, the Proponent clarified that a 30 m wide area of riparian vegetation will be trimmed at watercourse crossings, that vegetation management within is required to maintain sight lines for driver safety and that in riparian areas vegetation will be cut more than 10 centimeters above the ground surface to retain root structure.</p> <p>DFO would like to note that a proposed recovery strategy exists for Bull Trout in the Saskatchewan-Nelson Rivers that considers riparian habitat to extend to 30 m from a stream high water mark, due to a strong reliance for providing food, instream structure, shade, moderating water temperature and regulating the amount of sediment entering the water. Although the Mackenzie River Bull Trout population is not considered in this recovery strategy, DFO is of the opinion that vegetation clearing within 30 m from each water course should be avoided or minimized.</p>	DFO recommends that vegetation clearing within 30 m from each water course that has the potential to be Bull Trout habitat should be avoided or minimized as proposed in the Bull Trout, Saskatchewan-Nelson Rivers	It is unlikely that bull trout are present in the watercourses crossed by the Project, as described in the Developer’s Assessment Report. The Mackenzie Gas Project completed fish assessments over multiple years and multiple seasons and did not capture bull trout in the watercourses crossed by the proposed Project. In addition, fish sampling conducted by the Government of Northwest Territories (GNWT) between 2020 and 2024 has not captured any bull trout; however, the Project is within the distribution of the western Arctic population of bull trout (DFO 2024). In order to further refine the potential presence of bull trout within watercourses crossed by the Project, the GNWT is currently conducting supplementary sampling of specific watercourses crossed by the Project for environmental deoxyribonucleic acid (eDNA) analyses which will be reviewed to evaluate whether bull trout are present. The eDNA analyses are being conducted on

		<p>In addition, as mentioned in DAR Review comment DFO 19, Bull Trout (Western and Arctic populations) are currently under reassessment by COSEWIC and may be listed as Threatened after the assessment (potentially as early as 2025). If the listing for Bull Trout is changed, the 30 m wide riparian zone may be considered critical habitat at the time of project review and a reassessment of fish and fish habitat would be required for the project.</p>	<p>recovery strategy.</p>	<p>a selection of larger watercourses which may have a higher likelihood of the presence of bull trout as well as smaller watercourses that are expected to have a lower likelihood of bull trout presence.</p> <p>Large watercourses along the proposed Project alignment have existing crossings (i.e., culvert, bridge), with the exception of the Great Bear River, which is not part of this Project (see the GNWT’s response to CanNor Information Request #15). These existing crossings are sufficiently high above the watercourse bed such that limited or no clearing/brushing is required within 30 metres of the watercourse. Depending on the geometry of the final road embankment, reducing the amount of clearing at these locations may be possible, while still maintaining the required lines of sight for public safety. The riparian areas on either side of each crossed watercourse will not be removed but may require trimming to maintain the lines of sight for public safety.</p> <p>As described in the recovery strategy for bull trout (Saskatchewan – Nelson Rivers population, listed as Threatened under Schedule 1 of the Species at Risk Act) (DFO 2020), existing anthropogenic disturbances, such as watercourse crossings (i.e., existing crossings along the Mackenzie Valley Winter Road), are not considered critical habitat; however, the western Arctic population of bull trout is considered of Special Concern and therefore does not have designated critical habitat. The GNWT understands the value of intact riparian zones adjacent to watercourses, including those that support sensitive species such as bull trout, and will minimize vegetation clearing wherever practicable.</p>
20	DFO-11: Bull Trout Habitat Suitability-Response to	The Proponent provided the following rationale on why habitat at the proposed stream crossings is considered unsuitable for Bull Trout:	DFO recommends the proponent not assume a stream	A supplementary field program is being conducted by qualified environment professionals which includes fish sampling, eDNA sampling, and fish habitat assessments at watercourses crossed by the Project. This supplementary field

<p>DAR Review Comment DFO-20; DAR Vol. 3, Sub-s. 17.2.2, App. 17A, Sub-s. 4.2.1.5</p>	<p>Most of the watercourses that may be crossed by the Project are small second or third order streams of low gradient that drain directly into the Mackenzie River, a river with relatively turbid water. In contrast, bull trout prefer higher gradient watercourses connected to larger relatively clear downstream rivers such as the Keele and South Nahanni Rivers (Mochnac et al. 2013).</p> <p>Most of the watercourses that may be crossed by the Project have substrates dominated by fines and organics. In contrast, adult bull trout (the life stage most likely to access watercourses on the eastern side of the Mackenzie River), prefer habitat with cobble to boulder substrates (Mochnac et al. 2004). Juveniles are less likely to make the long migration from western headwater streams of the Mackenzie River to eastern tributaries of the Mackenzie River due to the increased risk in predation and energy cost.</p> <p>Most of the watercourses that may be crossed by the Project are shallow and lack deep pools suitable for bull trout overwintering; most watercourses that may be crossed by the Project freeze to the bottom in winter.</p> <p>DFO mostly agrees with the rationales but would like to point out that in Mochnac et al (2021) attached, Bull Trout were sampled in the Prairie Creek watershed in streams with gradients ranging from 0.7 to 13.8 %. The article also states that in the Prairie Creek watershed, adult bull trout move into first to third-order habitat patches in the late summer to spawn and then migrate downstream into larger tributaries in the fall. Additionally, juvenile bull trout rear for 3-5 years in second and third-order streams. Finally, in Alberta, juvenile and adult bull trout overwinter in small, shallow (max depth 0.4 to 1.5 m) pools that are isolated from one another, have little cover, and receive flow from groundwater springs (Stewart et al., 2007).</p> <p>References: Mochnac, N. J., et al. (2021). "Fringe effects: detecting bull trout</p>	<p>does not support Bull Trout based on stream morphology alone</p>	<p>data, in addition to data provided in the Developer's Assessment Report, will be compared to studies conducted in the Northwest Territories regarding bull trout. Fish habitat information and in-situ water quality data will be compared to the recovery strategy for the Saskatchewan – Nelson Rivers population of bull trout to determine if there are waterbodies that may provide suitable bull trout habitat based on the features and attributes provided in table 6 of the recovery strategy (DFO, 2020). The Government of Northwest Territories (GNWT) understands the value of indirect bull trout habitat (e.g., surface water inputs from drainages), and seasonal habitat. Evaluation of the habitat potential for bull trout at each proposed watercourse crossing will be included in a single compiled report. This report will be submitted to the Department of Fisheries and Oceans Canada (DFO) for review as part of the Fisheries Act regulatory review process following completion of the environmental assessment. The GNWT looks forward to reviewing this, and other Project-specific information with DFO.</p>
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		<p>(Salvelinus confluentus) at distributional boundaries in a montane watershed." Canadian Journal of Fisheries and Aquatic Sciences 78: 1030-1044.</p> <p>Stewart, D. B., et al. (2007). Fish life history and habitat use in the Northwest Territories: bull trout (Salvelinus confluentus) Winnipeg, Mb, Fisheries and Oceans Canada. 2801: i-46.</p>		
21	DFO-12:Offsetting-DAR Vol. 3, Sec. 17, App. 17A	<p>A Fisheries Act authorization will likely be necessary for the construction of the MVH, along with offsetting measures to compensate for any lost or altered fish habitat. The DAR does not present conceptual offsetting options. Given the challenges of finding suitable offsetting options in the North and the need to consult impacted Indigenous Groups, it is crucial to start planning for offsetting early in the project's life cycle.</p>	<p>DFO Recommend the Proponent develop a preliminary conceptual Offsetting Plan.</p>	<p>The Government of Northwest Territories (GNWT) looks forward to further discussing with the Department of Fisheries and Oceans Canada (DFO) how the requirements of the Fisheries Act apply to the Project. The GNWT understands the potential for the Project to require Authorization under the Fisheries Act; however, the GNWT notes that offsetting requirements, if any, will be more precisely defined during the Project's detailed design and regulatory phase. Opportunities for offsetting, if required, will be identified through review of existing field data and through discussion with local communities to support early consultation. Opportunities for offsetting will be evaluated with consideration for DFO's offsetting policy (DFO 2019). Following review of the Project, should DFO determine Authorization under the Fisheries Act is required, the GNWT will develop a conceptual Offset Management Plan as part of the application for Authorization under the Fisheries Act for further discussion with DFO.</p> <p>It is the GNWT's view that it is reasonable to initiate DFO's detailed review of the Project under the Fisheries Act as part of the regulatory approvals stage of the Project, which will follow completion of the environmental assessment. Per the GNWT's response to CanNor IR#15 and CanNor IR#18, the GNWT would be pleased to answer any additional questions from DFO regarding the scope of the Project.</p>
22	ECCC-01: Selection of Appropriate Spatial	<p>The Proponent outlines their analysis of the cumulative effects boundaries applicable to boreal caribou for this Project in Section 10.1.4.1 – Spatial Boundaries.</p>	<p>ECCC requests the Proponent: Provide further rationale and</p>	<p>1. The Caribou and Moose Local Assessment Area (LAA) (15-kilometre buffer) was used to assess cumulative effects because it encompasses "... known past, present, and reasonably foreseeable projects and physical activities that</p>

<p>Assessment Boundaries for Boreal Caribou and Cumulative Effects- Dar Vol. 2, Sec. 10, 10.1.4.1, 10.5, 10.5.1, 10.5.2.3.1.1; DAR Vol. 2, Sec. 10, Sec. 10.1.4.1, App. 10A</p>	<p>The Proponent uses a Local Assessment Area (LAA) to assess cumulative effects to boreal caribou. The LAA is defined as the area within a 15 km radius of the Project Development Area (PDA - the area of direct project disturbance/footprint). The Proponent notes there is no Regional Assessment Area (RAA) defined for caribou in the Developer’s Assessment Report (DAR). Part of the Proponent’s justification for this boundary is that 15 km is “the estimated maximum distance caribou moved in 24 hours” (Section 10.1.4.1, pg. 10-11). The Proponent stated they avoided an area as large as the Northwest Territories Range (NT1) habitat planning unit range for assessing effects, as the Mackenzie Valley Environmental Impact Review Board (MVEIRB) found the scale of NT1 to be “inappropriately large and diluted the effects on caribou” for the similarly assessed project, the Tlicho All-Season Road (Section 10.1.4.1, pg. 10-11).</p> <p>The area of the NT1 range is over 44 million hectares. The Proponent-selected caribou LAA is only slightly over 1 million hectares (Table 10.18). It is not clear how the Proponent chose the current LAA size. The Proponent did not rationalize that this selection is of a sufficient size to accurately capture other projects that may be relevant to the survival of boreal caribou in the area or reflect biologically relevant regional habitat conditions.</p>	<p>clarity for the selection of the LAA (15 km buffer) as the relevant scale for the cumulative effects assessment area for boreal caribou. Clarify whether areas other than the proposed LAA were considered, and if not, then explain why. If other areas were considered, then provide the rationale to disregard them in favour of the 15 km buffer along the PDA. Outline what ecological factors and/or Indigenous groups’ perspectives were considered when evaluating which potential</p>	<p>could overlap spatially and temporally with the [Project’s] residual effects”. Larger spatial scales were also used to assess cumulative changes to caribou habitat to align with the Federal Recovery Strategy (ECCC, 2020), which identifies disturbance thresholds for critical caribou habitat that ensure self-sustaining local populations. These additional spatial scales included the NT1 Boreal Caribou Range and Sahtu and Southern NWT Range Planning Regions (GNWT, 2019). Cumulative habitat loss at each scale was first reported in Table 10.18 of the Developer’s Assessment Report (DAR). Since then, newer data sources on human disturbances (circa 2020; https://open.canada.ca/data/en/dataset/63e1cda6-debe4b9b-b075-3666443e30b4) and wildfires (GNWT-ECC, 2024) have become available. Thus, cumulative habitat loss calculations have been updated using these newer data sources and are presented in the Government of the Northwest Territories (GNWT)’s response to Mackenzie Valley Environmental Impact Review Board (MVEIRB) Information Request (IR) #52. Therefore, while the Caribou and Moose LAA was used as the spatial area for the cumulative effects assessment, other, larger spatial scales were used to assess cumulative effects on boreal caribou (e.g., range planning boundaries, NT1).</p> <p>2. As stated in the first response (above), the NT1 Boreal Caribou Range and Sahtu and Southern NWT Range Planning Regions were also considered in the assessment of cumulative effects on caribou from changes to habitat. Please refer to the GNWT’s responses to the following MVEIRB IRs for further information on: (1) spatial scale and study extent —MVEIRB IR #44, and (2) update to Table 10.18 in the DAR’s cumulative effects assessment —MVEIRB IR #52.</p>
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			area(s) would be better at “identifying and assessing current projects/activities as well as any foreseeable future projects/activities” that may affect boreal caribou that interact with the Project.	
23	ECCC-02: Clarification of Study/Assessment Area for Boreal Caribou: LSA/LAA and RSA/RAA- DAR Vol. 2, Sec. 10, App. 10A	The Proponent uses the terms Local and Regional Study Area (LSA/RSA) and Local and Regional Assessment Area (LAA/RAA) seemingly interchangeably in the Developer’s Assessment Report (DAR). The main section of the DAR discussing the assessment of potential effects on caribou and moose (Section 10) uses the term RAA while the technical data report (Appendix 10A) uses the more common terms LSA and RSA. Section 10 of the DAR excludes the use of an RAA/RSA for boreal caribou, stating the LSA will appropriately substitute for the RSA.	ECCC requests the Proponent: Clarify and define which terms are to be used when discussing impacts to caribou in the DAR (i.e. LSA/RSA or LAA/RAA), and use these terms consistently. Provide the rationale, including advantages and disadvantages,	1. The terms Local Study Area (LSA) and Regional Study Area (RSA) were used to characterize existing conditions for Valued Components, including boreal caribou. The study of existing conditions (Caribou and Moose Technical Data Report, Developer’s Assessment Report [DAR] Appendix 10A) predates assessing potential effects in the DAR. The DAR defines the spatial scope used for the assessment of potential effects on VCs; the terms Local Assessment Area (LAA) and Regional Assessment Area (RAA) are used for this. Caribou and moose are assessed within the Caribou and Moose Local Assessment Area (Caribou and Moose LAA), which is separate from the LAA and Regional Assessment Area (RAA) used for other wildlife (DAR Section 10.1.4), because there is no RAA for the assessment of caribou and moose. The Caribou and Moose LAA assesses Project-specific effects on caribou and moose. 2. For further discussion on why the Caribou and Moose LAA is an appropriate spatial extent for assessing boreal caribou, refer to the DAR Section 10.1.4 and the Government of Northwest Territories’ response to Mackenzie Valley

			to exclude an RAA/RSA from the assessment for boreal caribou, and to have the LSA serve as the RAA/RSA (Section 10 of the DAR).	Environmental Impact Review Board Information Request #44.
24	ECCC-03: Cumulative Effects Analysis to Boreal Caribou: Past, Present and Reasonable Foreseeable Projects- DAR Vol. 2, Sec. 10.5, 10.6;	<p>The Mackenzie Valley Environmental Impact Review Board (MVEIRB)'s Environmental Impact Statement Guidelines (2004) state that proponents will "assess the impacts of the development in combination with the impacts of all other past, present and reasonably foreseeable future developments and human activities".</p> <p>Current Imperial Oil operations are well within the Local Assessment Area (LAA) as designated by the Proponent, yet oil operations are absent from the cumulative effects assessment (Section 10.5.1, Table 10.17).</p> <p>Imperial Oil has been operating in the Norman Wells area of the Northwest Territories since 1920. This ongoing oil and gas activity likely had (and will continue to have) impacts on boreal caribou. Imperial Oil recently rescinded an environmental assessment of a waste management facility expansion (MVEIRB EA 2223-01). While this application has been withdrawn, a more detailed application is anticipated to be put forward at a later date. A waste management facility expansion would be an activity within the LAA defined by the Proponent in the Developer's Assessment Report (DAR). Remediation of the entire Imperial site may also be a "reasonably foreseeable" human activity. Past, present or reasonably foreseeable potential future project activity in the area could have cumulative impacts on boreal caribou.</p>	ECCC requests the Proponent revise the cumulative effects assessment for boreal caribou to include Imperial Oil activities in the Norman Wells area (past, present and reasonably foreseeable future activities). This should include a thorough pathways of effects analysis (e.g. changes to habitat, movement, mortality risk and health, significance	Please see the attached document.

			determinations, etc.), as well as a list of assumptions. If the Proponent does not revise the cumulative effects assessment for boreal caribou, then provide a clear, scientifically defensible rationale as to why they are not.	
25	ECCC-04: Probable Caribou Movement Corridors, PDA Overlap with Existing Disturbed Areas, Effects to Caribou Habitat Connectivity and Movement- DAR Vol. 2, Sec. 10.4, 10.4.2.3.1.3, Sec. 10.5.3;	<p>The Developer’s Assessment Report (DAR) discusses potential movement corridors (Section 10.4), as does a report entitled “Mackenzie Valley Highway Project: Inferring the Potential Barriers to Boreal Caribou Movement” (the report) that was provided for review on February 27, 2024, as part of the environmental assessment process (EA1213-02) to the Mackenzie Valley Environmental Impact Review Board (MVEIRB). The report notes there are locations where caribou have crossed and are more likely to cross the Mackenzie Valley Winter Road. The report (pg. iii) also states that the authors “... do not anticipate the highway to pose a barrier to caribou movement”. However, probable movement corridors have not been expressly identified in either document.</p> <p>The report highlights the impacts habitat disturbance has on caribou movements, including habitat avoidance and fragmentation. The Proponent states on page 10-51 of the DAR that “An indirect alteration of boreal caribou or moose habitat is expected through sensory disturbance caused by noise and dust deposition, edge effects on habitat, and fragmentation that can</p>	ECCC requests the Proponent: Clarify whether further analysis of boreal caribou movement is planned as part of the Project assessment. If so, then elaborate on whether the analysis will include identification and mapping of probable movement	<p>1. No further movement studies are planned as part of the Project assessment, as the Government of Northwest Territories (GNWT) believes that the requests are addressed in the current analyses, and as follow-up included in the GNWT’s response to MVEIRB IR#56 noted below. Map 3 (early to mid-winter) and Map 4 (calving to post-calving) in the report Mackenzie Valley Highway Project: Inferring the Potential Barriers to Boreal Caribou Movement (EDI 2024) provide ‘predicted’ crossing locations based on simulated boreal caribou paths. In those maps, red line segments indicate locations where caribou crossings are likely to occur but are hindered by the Déljine Winter Road. The GNWT’s response to MVEIRB IR#56 also provides a map of all known crossing locations along the Mackenzie Valley Winter Road based on available GPS collar data (2003– 2023).</p> <p>2. Figure CanNor 25-1 demonstrates the overlap between the Project Development Area and existing disturbed areas, including Human Disturbances (plus 500 m buffers, as of</p>

		<p>result in habitat avoidance and reduced habitat effectiveness in areas adjacent to the PDA... Edge effects and fragmentation may result from vegetation clearing activities, particularly where the PDA intersects forested habitats.”</p> <p>The Proponent goes on to say that 47.8% of the Project Development Area (PDA) overlaps with previously disturbed areas, which have already created edge effects and fragmentation. The DAR does not provide a map indicating this overlap</p>	<p>corridors for boreal caribou within the PDA and Local Assessment Area (LAA). If the Proponent is not planning to conduct further analysis on boreal caribou movement, then provide a clear, scientifically defensible rationale as to why this analysis is not needed.</p> <p>Provide a map that illustrates the extent to which the PDA overlaps with existing disturbed areas (as defined in the Federal Recovery Strategy).</p> <p>Identify specific mitigation measures to address impacts to crossing</p>	<p>2020) and wildfires <40 years old (as of 2023).</p> <p>3. Mitigation measures to address impacts on crossing accessibility and to reduce vehicle collisions are described in Table 10.8 in the Developer’s Assessment Report (DAR). Signage may be used to specify speed limits and warnings at wildlife crossing locations (DAR Section 10.5.4.2, Mitigation for Cumulative Effects). Also, refer to the GNWT’s response to MVEIRB IR#56B for a summary of proposed mitigation measures to prevent vehicle collisions with wildlife at known crossing locations.</p> <p>4. Evidence to support the statement that the “all-season road is unlikely to cause greater impacts on boreal caribou compared to the winter road” is discussed in detail in EDI (2024). This is specifically in reference to the impacts of existing natural barriers, disturbances, and habitat distribution. Please refer to Section 4 (Discussion) of EDI (2024) for a discussion on this conclusion. Further context and summaries are also provided in the GNWT’s response to MVEIRB IRs #44 and #45.</p>
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			<p>accessibility and to reduce vehicle collisions.</p> <p>Clarify what evidence is available to support the statement that the all-season road will not have a greater impact on movement and connectivity than the winter road.</p>	
26	<p>ECCC-05: Loss of Biophysical Attributes- Caribou Habitat- DAR Vol. 2, Sec. 10.4.2.3.1.1;</p>	<p>The Proponent states that the Project Development Area (PDA) will result in direct general habitat loss of 2,315.2 ha, and of that, 94.3 ha are considered selected boreal caribou habitat, and indirect selected habitat disturbance of 1,466 ha. The Proponent has estimated the total combined caribou habitat loss as 1,560.0 ha (94.3 ha direct and 1,466 ha indirect loss).</p> <p>The Federal Recovery Strategy (pg. 38) describes biophysical attributes as "... the habitat characteristics required by Boreal Caribou to carry out life processes necessary for survival and recovery." Biophysical attributes are also described as a major component of critical habitat in the NT1 range, therefore it is important to understand the types and amounts of biophysical attributes lost as a result of the proposed Project.</p> <p>The Proponent uses the term 'general' and 'selected' habitat but does not provide a definition of these terms.</p>	<p>ECCC requests the Proponent:</p> <p>Define 'general' and 'selected' habitat. Discuss how the definition aligns with the Federal Recovery Strategy (Section 3.3, Glossary, and Table H-1).</p> <p>Clarify what type of biophysical attributes are present within</p>	<p>Please see the attached document.</p>

			<p>the 2,315.2 ha that will be lost.</p> <p>Discuss the unique nature of biophysical attributes present in the 94.3 ha that is anticipated to be lost.</p> <p>Clarify what type of biophysical attributes are present within the 1,466 ha that is anticipated to be disturbed.</p> <p>Provide a map in order to illustrate where biophysical attributes are anticipated to be lost along the proposed Project.</p>	
27	ECCC-06: Ground-Truthing of Disturbed and Undisturbed Caribou	The proposed project overlaps the Northwest Territories Range (NT1) as described in Environment and Climate Change Canada's "Recovery Strategy for the Woodland Caribou (<i>Rangifer tarandus caribou</i>), Boreal Population, in Canada" posted on the Species at Risk Public Registry. The Federal Recovery Strategy identifies the amount of habitat disturbance within a boreal caribou range as a	<p>ECCC requests the Proponent:</p> <p>Calculate and provide (1) affected area (in</p>	Please see the attached document.

<p>Habitat in NT1 Range- Dar Vol. 2, Sec. 10.5, Sec. 10.5.2.3.11</p>	<p>key factor determining whether a local population is likely to be self-sustaining over time. The recovery strategy specifies that each responsible jurisdiction manage the habitat disturbance within a range to achieve or maintain a self-sustaining local population through a range plan. The recovery strategy also indicates that maintaining connectivity of boreal caribou habitat between and within ranges is essential for boreal caribou persistence on the landscape.</p> <p>Several of the potential impacts of the proposed Project have been identified as threats to boreal caribou, as described in the amended (2020) Federal Recovery Strategy. On page 37 of the recovery strategy, it states that, “In ranges with undisturbed habitat equal to or above the threshold, critical habitat is at least 65% undisturbed habitat in a range”. At this time, and until the publication of all five finalized regional range plans identifying where that minimum 65% undisturbed habitat is protected, the guiding principle from the recovery strategy is that all undisturbed habitat should be considered critical habitat (habitat necessary for the survival and recovery of the species).</p> <p>In the Developer’s Assessment Report (DAR), Table 10.18 shows existing disturbance and Project contribution in NT1 Boreal Caribou Range, affected range planning regions (Sahtu and southern NWT) and the Caribou and Moose LAA. Table 10.18 presents the amount of disturbed habitat in the entire NT1 range assessed as 27.95% (or ~72% undisturbed total). This is inconsistent with the amended Federal Recovery Strategy (2020) and the Report on the Progress of the Recovery Strategy Implementation (2024), which indicates that NT1 is 35% disturbed (25% being fire and 9% being anthropogenic) with 65% of the range undisturbed habitat. These values were updated in the 2024 Federal Recovery Strategy Progress Report to 30% disturbed (22% fire, 10% anthropogenic). The Proponent states that the disturbance-based approach used to calculate boreal caribou habitat disturbance is based on data from fires &lt;/= 40 years old (1982-2021) and anthropogenic</p>	<p>ha) of undisturbed habitat, and (2) affected area of existing habitat, using the following standardized equations as derived from the Federal Recovery Strategy:</p> <p>(1) Effects on undisturbed habitat = (proposed Project footprint + 500 m buffer) - overlapping area(s) already considered disturbed habitat (see Recovery Strategy Glossary for definition)</p> <p>(2) Effects on existing habitat = (proposed Project footprint + 500 m buffer) - overlapping (permanent alterations(s) +</p>	
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		<p>disturbances (circa 2015, Table 10.18) plus a 500 m buffer. While the calculation is consistent with the recovery strategy, ECCC notes that the human disturbance layer is dated 2015 and likely does not represent the current on the ground human disturbance.</p> <p>Additional information is required in order to validate the Proponent's effects assessment.</p>	<p>500 m buffer).</p> <p>Provide maps in order to outline the features calculated in above request in a).</p> <p>Describe the level of confidence in the data used to develop conclusions on the effects to boreal caribou individuals and critical habitat.</p> <p>Clarify whether changes to landcover as a result of the 2023 forest fires are reflected in Table 10.18. If the values do not account for this change to the landcover, then explain and provide a rationale for why this information is not relevant</p>	
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			<p>when assessing impacts to caribou critical habitat.</p> <p>Clarify the date of “Human disturbance” Geographic Information System (GIS) data-layer used. If data used is circa 2015 (or earlier), then provide rationale to the use of this data, including how it reflects current land use.</p> <p>Clarify whether the data used to conduct the Proponent’s effects assessment (including human disturbance, fire, and landcover data) have been, or will be, ground-truthed and provide rationale for this</p>	
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			<p>decision.</p> <p>Provide a revised estimate of human disturbance based on current best available data.</p> <p>Revise Table 10.18, as appropriate, taking into consideration the revised estimate of human disturbance based on current best available data from request g).</p> <p>Provide the same calculations outlined in point a) for the NWT range planning regions of the Sahtu and Southern NWT</p>	
28	ECCC-07: Project-Specific	The Developer's Assessment Report (DAR) indicates that the assessment of effects on caribou is based on existing habitat information which has been collected over a variety of years, areas	ECCC request the Proponent provide:	1. The assessment of caribou biophysical attributes relied on the outputs of DeMars et al. (2020). The authors conducted a study to assess the biophysical attributes disproportionately

	<p>Baseline Information Studies Caribou Current Use of Habitat/Biophysical Attributes- DAR Vol. 2, Sec 10, 10.2, 10.7, Fig. 10.1, Fig. 10.2</p>	<p>and scales, and no additional Project-specific baseline information studies were conducted to validate that the available data is representative of current conditions on-the-ground.</p> <p>Collar data provided in the DAR spans a wide range of years and, along with land cover type, has been used to develop Technical Data Report – Caribou and Moose Figure 3.2, “Predicted All-Year Habitat Selection by Boreal Caribou” model and map. The Predicted All-Year Habitat Selection Map captures data from 2003-2023. The Proponent has not conducted baseline studies to validate whether the habitat and movement data used to create this map represent current conditions.</p> <p>Clarity on the current use of habitat/biophysical attributes is needed to understand how caribou are currently using the Local Assessment Area (LAA). Maps which show the land cover type could help reviewers better visualize current land use. Further, the Resource Selection Function (RSF) model referenced in the DAR is used as the basis for habitat loss calculations; the RSF study (ENR, 2020a), is unavailable for review, and if provided could shed some light on how the Proponent has made the reported calculations.</p>	<p>further justification as to how the existing habitat information is adequate without the need for additional Project-specific baseline data for caribou;</p> <p>the seasonal and all-year habitat RSF study (ENR, 2020a; unpublished) for review; and</p> <p>mapping of land cover type that illustrates and identifies biophysical attributes of boreal caribou habitat</p>	<p>used by boreal caribou (i.e., selected habitat) during several seasonal periods, including year-round (all seasons), calving, and late winter. DeMars et al. (2020) used available GPS collar data from boreal caribou in the Sahtu and Dehcho regions of the NT1 range, including from animals located near the Project. Given the comprehensive nature of this study, both in space and time, the Government of Northwest Territories (GNWT) believes the habitat information and maps produced as part of the study are sufficient for caribou baseline data.</p> <p>2. ENR (2020a; unpublished) refers to unpublished data for the boreal caribou resource selection function maps in the NWT. The data are derived from the outputs by DeMars et al. (2020), which is the primary technical report requested by the reviewer. The report is accessible on the Mackenzie Valley Environmental Impact Review Board (MVEIRB) public registry: https://reviewboard.ca/upload/project_document/Comment-06-Boreal-Caribou-Report-2020-zdn74.pdf</p> <p>3. Maps of selected habitat (i.e., the combination of biophysical attributes disproportionately used by boreal caribou) are provided for year-round (all seasons), calving, and late winter in the GNWT’s response to MVEIRB Information Request (IR) #60. To better interpret these maps, refer to DeMars et al. (2020), including Figures 17 and G 8 in that report, and the GNWT’s response to CanNor IR#26.</p>
29	<p>ECCC-08: Methodology Behind Proponent's 2022 Avian Survey Work-Email sent to</p>	<p>ECCC-Canadian Wildlife Service (CWS) was engaged by the Proponent to provide feedback on their draft 2022 Bird Study Scope and Approach document, which was meant to better assess the potential effects of the proposed Project on migratory birds and avian Species at Risk, and propose methods to fill gaps in existing data. This document led to the creation of Appendix 20C in the Developer’s Assessment Report (DAR) – the 2022 Avian Survey</p>	<p>ECCC requests the Proponent:</p> <p>Provide detail on how the ECCC advice provided on the bird study</p>	<p>Please see the attached document.</p>

<p>Proponent March 13, 2022 by ECCC-CWS; RE: MVH proposed 2022 bird study scope- (Methodology behind developer's proposed 2022 field survey with ARUs); DAR Vol. 3, Sec. 20.0, App. 20A, 20C</p>	<p>Report, which subsequently informed Appendix 20A – the Bird and Bird Habitat Technical Data Report. The above two reports inform the Proponent’s overall assessment of potential effects on birds (Section 20 of the DAR).</p> <p>ECCC provided a response letter via email on March 13, 2022 (attached .pdf) stating that ECCC-CWS could not fully support the Proponent’s proposed 2022 scope of work. ECCC-CWS had differing views on the adequacy of the approach proposed in the Proponent’s draft document. The topics touched on were a) Predictive modelling and the use of Boreal Avian Monitoring Project models; b) Guidance on the number of sample sites per land cover class; c) Standardized point count data to account for imperfect detection; d) Use of bird song recognizers; and e) Data sharing.</p> <p>No further correspondence on this topic was received from the Proponent after ECCC-CWS advice was offered. ECCC-CWS notes that the Proponent has completed surveys in 2022 using Autonomous Recording Units (ARUs). It is unclear how ECCC-CWS advice was used.</p>	<p>design was incorporated into the 2022 Bird Study (Appendix 20C), including any deviations from the advice. The following topics should be covered:</p> <p>Predictive modelling and the use of Boreal Avian Monitoring Project models; Guidance on the number of sample sites per land cover class; Standardized point count data to account for imperfect detection; Use of bird song recognizers; and Data sharing</p> <p>Provide a summary that outlines how baseline data was used to</p>	
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			<p>inform mitigation measures and adaptive management. Comment on the overall adequacy of the data used to develop a baseline for the Project and inform subsequent predictions on the potential effects to migratory birds in the DAR. Include the level of confidence in this data, and how representative it is of baseline conditions in the Project Development Area, Local Study Area, and Regional Study Area. Note whether there are still gaps in knowledge.</p> <p>Comment on</p>	
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			<p>whether existing data was used to conduct a power analysis in order to inform sample size requirements per strata (land-cover class), and whether that analysis was then acted upon to determine sampling size and draw more accurate conclusions on the significance of impacts to migratory birds. If the power analysis was not conducted, then provide rationale for why the analysis was not completed</p>	
30	<p>ECCC-09: Data on Migratory Birds and the Reliance on Modelling and ARUs for the Majority of Data- DAR Vol. 3, Sec. 20.0,</p>	<p>Autonomous Recording Units (ARUs) are useful tools for making inferences about densities of territorial singing birds (i.e. most landbirds), but are less effective to identify abundance of semi-colonial birds (e.g. waterfowl) and quieter birds (e.g. shorebirds, which use sound differently than landbirds).</p> <p>The Proponent draws conclusions on the potential effects of this Project on all migratory birds based mainly on the following data sources:</p>	<p>ECCC requests the Proponent:</p> <p>Provide the rationale for reliance on ARU data and desktop modelling (BAM,</p>	<p>Please see the attached document.</p>

	<p>App. 20A</p>	<p>BAM (Boreal Avian Modelling project; largely derived from data collected in southern Canada), eBird model predictions (largely derived from data collected in southern Canada), 2004 and 2006 ECCC- Canadian Wildlife Service (CWS) point-count surveys (Wrigley, Norman Wells and north of Tulita collection sites), 2017 ECCC-CWS ARU data (collection sites along winter road between Wrigley and north of Tulita), and 2022 Proponent ARU data collected specifically for this Project (collection sites along winter road between Wrigley and north of Tulita).</p> <p>The proposed Project's study area has limited, or no data presented for waterfowl and shorebirds.</p>	<p>eBird) for the Developers Assessment Report's (DAR) conclusions on migratory birds, particularly on how the use of southern population data can or cannot be used to derive conclusions for northern populations.</p> <p>Provide a discussion on how impacts to non-landbird species (such as waterfowl and shorebirds) are considered, given the known limitations of ARU data.</p> <p>Comment on the limitations of the data used and the conclusions drawn from it. Explain the implications to non-landbird</p>	
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			species groups that do not have recent human observer surveys of bird abundance (point counts, aerial survey, area-based or transect ground searches, etc.). Provide specific information on waterfowl and shorebirds, including populations and seasonal densities, and describe potential Project effects to these migratory birds and how these effects will be mitigated.	
31	ECCC-10: Disturbance to Migratory Birds During Other Key Life Periods- Arctic Breeding Migrants; Climate Change	In most of Canada, migratory bird diversity and abundance are highest during the local breeding season, and the disturbance or destruction of this breeding habitat can significantly affect populations. However, disturbing migratory birds while they are molting, migrating, or overwintering can also affect populations (Wolfe et al. 2019), and project impact assessments need to identify any relevant risks and potential population implications for those species. Project proponents must consider their proposed projects' potential impacts on distribution and abundance of migratory birds beyond the local nesting period, particularly for	ECCC requests the Proponent: Describe how the assessment will account for and assess effects to avian species present in and/or	The Government of Northwest Territories (GNWT) agrees the Mackenzie River Valley is an important migration corridor for migratory birds, which is discussed in Appendix 20B - Birds and Bird Habitat Technical Data Report. The assessment focused on potential effects on birds and bird habitat in the Local Assessment Area because this is where effects from direct and indirect habitat loss due to the Project are expected to occur (see Section 20.1.3 and 20.1.4 of the Developer's Assessment Report [DAR]). Bird habitat that

<p>Considerations - DAR Vol. 3, Sec. 20 Table 20.1</p>	<p>arctic-breeding migrants.</p> <p>The Mackenzie Valley is a significant migration corridor for arctic-nesting migratory birds. Both northbound (spring) and southbound (fall) migrants use a similar corridor to the proposed Project's routing. The habitats they use within the Regional Study Area (RSA) may be very important to their survival and reproduction.</p> <p>Other groups, including the Norman Wells Renewable Resources Council (NWRRC) have noted concern with changing bird migration patterns/directions and less frequent appearance of some species (Table 20.1) which may suggest change and uncertainty in migration movements and patterns. These changes could be due to any number of factors including the effects of climate change, the effects of which most scientists acknowledge are amplified in northern Canada.</p> <p>The Proponent has not provided adequate spring and fall migrant bird surveys, especially survey methods that capture species not easily detected by Autonomous Recording Units (ARU).</p>	<p>potentially using habitats within the RSA during spring and fall migration.</p> <p>Include a specific section focused on arctic-breeding species (including waterfowl and shorebirds). This section should explain when and how spring and fall migrant studies will be conducted and/or a description of how this information will be incorporated into the assessment of effects, and the identification of mitigation measures. If ARU data or desktop modelling are being considered to supplement data, explain how the effects</p>	<p>might be affected by the Project and other projects in the larger Regional Assessment Area is addressed as part of the cumulative effects assessment (see Section 20.5 of the DAR).</p> <p>The GNWT also agrees that Project activities could affect migratory birds during breeding as well as other seasons and that autonomous recording units are not an effective means of surveying for some species of Arctic migrants, which is why the birds and bird habitat assessment used a habitat-based approach. As discussed in Section 20.4.2.3.1.1 of the DAR, the habitat-based approach considered waterbird, waterfowl, and shorebird habitats required throughout the year including during the breeding and migration seasons. The habitat-based approach included potential effects on the Middle Mackenzie River Islands Important Bird Area as well as incorporation of important stopover/staging areas using Traditional Knowledge and information from the Sahtú Land Use Plan (see Section 20.2.2.1 of the DAR).</p> <p>No spring and fall bird migration studies are planned. The GNWT considers the habitat-based approach together with Traditional Knowledge sufficient to support the DAR and conclusions related to migratory birds including Arctic migrants.</p> <p>The GNWT acknowledges the uncertainties associated with potential direct and indirect effects of climate change on bird distribution and abundance, which are discussed in Section 20.7.2 of the DAR. A discussion of predicted future conditions related to the potential effects of climate change on birds and bird habitat including species at risk was also provided in the GNWT's response to Mackenzie Valley Environmental Impact Review Board (MVEIRB) Information Request (IR) #2.</p>
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			<p>to species not easily detected by ARUs will be assessed.</p> <p>Describe how the effects of climate change were/will be incorporated into the analysis of effects to migratory bird species.</p>	
32	<p>ECCC-11: Waterfowl and Data Limitations, Collar Data, Increased Human Access- DAR Vol. 3, Sec. 20.0, Table 20.5</p>	<p>The Proponent notes that migrating waterbirds/waterfowl are "highly mobile and adjust their daily distribution relative to sensory disturbance" (Section 20.4.2.3.2.1). The Developer's Assessment Report (DAR) also notes that Indigenous groups have heightened concern about effects to many specific species of waterfowl (Section 20.2.2.1; Table 20.5).</p> <p>Given the limited ability of Autonomous Recording Units (ARUs) to estimate the density and abundance of species like waterfowl, limited data in the area and changing climate, ECCC notes that further fieldwork and data collection on waterfowl abundance may be warranted to more reliably identify and manage effects from the Project and determine appropriate mitigation methods.</p> <p>The proposed highway routing is near riparian habitat and many wetlands. ECCC also notes there are two key Important Bird Areas (IBAs) along the Mackenzie River used for foraging and migratory stopover: Bracket Lake IBA and the Middle Mackenzie River IBA. ECCC has collared waterfowl and existing data on migratory bird use in these particular areas.</p> <p>Disturbance from construction and operation of the highway may</p>	<p>ECCC requests the Proponent:</p> <p>Provide justification for why the Proponent may or may not be considering a follow up meeting with ECCC-CWS to discuss to waterfowl GPS collar data collection and further migratory bird surveys. If action is being considered, then detail potential</p>	<p>Please see the attached document.</p>

		<p>affect the suitable migratory stopover sites in the area for waterfowl. It may also make these species more accessible to human harvesters and predatory wildlife species.</p> <p>During a February 14th, 2024, meeting with the Proponent, ECCC-Canadian Wildlife Service (CWS) offered to increase the frequency of data collection on Global Positioning System (GPS) collared snow geese (or similar) in the Mackenzie Valley area. This could potentially provide higher resolution data on migratory species in these areas, to better increase the confidence of prediction of effects on such species. However, there is a limited time-window in which to do these adjustments every spring.</p> <p>ECCC welcomes follow up to the February 14th meeting should the Proponent consider: approaching ECCC-CWS staff to request collaboration and sharing of collar data of waterfowl in the area, and consider the increase in frequency of GPS collar data collection; and further surveys of additional migratory birds that frequent the proposed Regional Assessment Area (RAA) to better understand waterfowl diversity and abundance.</p> <p>This data could be used by the Proponent for adaptive management to better mitigate Project effects on waterfowl.</p>	<p>plans (which seasons, number of individuals, etc.) and elaborate on how this will help address data gaps.</p> <p>Further describe how human access to nesting or staging areas will be incorporated into analysis of effects to migratory bird species, including changes in harvest pressure on migrant bird species, specifically waterfowl.</p>	
33	<p>ECCC-12: Accounting for Interannual Variation in Migratory Bird Surveys- DAR Vol. 3, Sec. 20.0, Sec 20.2.1</p>	<p>The GNWT supplemental avian survey work completed in 2022 compiled one year of breeding-season data. The collection of one year of baseline data is not sufficient to reflect natural variation in species abundance/use of habitat.</p> <p>ECCC recommends bird surveys over a period of at least two consecutive breeding seasons to account for interannual variation.</p>	<p>ECCC request the Proponent:</p> <p>Discuss whether they are planning to conduct additional survey work for migratory birds</p>	<p>Please see the attached document.</p>

			<p>to supplement the 2022 bird surveys.</p> <p>Provide the survey methods/plans to conduct this survey work in order to account for interannual variation.</p> <p>Provide a comprehensive justification if further migratory bird data will not be gathered, and how the current data will account for annual variation. Please include any assumptions or extrapolations that could be considered by reviewers if the collection of two additional years of survey data is not feasible.</p>	
34	ECCC-13: Consideration	ECCC notes that within the Regional Assessment Area for the Project there are two key migratory bird areas identified as	ECCC requests the Proponent	Please see the attached document.

	of Impacts to Important Bird Areas (IBAs)- DAR Vol. 3, Sec 20.2, 20.2.2.1	important for foraging and migratory stopover: Bracket Lake IBA and the Middle Mackenzie River Islands IBA.	provide further details on how impacts to the IBAs were considered, including effects from the Project on migratory birds and their use of these areas, and list specific mitigations relevant to them.	
35	ECCC-14: Derivation of Land Cover Classes in the Developer's Assessment Report (DAR): Accuracy and Age of Data- DAR Vol. 3, Sec. 20.0, 20.4.1.1, Table 20.10	<p>It appears that land cover classes were derived via a desktop review of geospatial data from 2013 & 2017. Details on the origins of the data used to create these classes were not clearly described in the DAR. Landsat satellite imagery used to derive the geospatial data appears to have been derived from 2007-2013 data, as noted in Section 20.4.1.1 of the DAR:</p> <p>“Land cover classes were quantified using EOSD NWT geospatial data (NRCan and GNWT, 2017).=This dataset is part of the Multi-source Vegetation Inventory Project (NRCan, 2020) and uses an unsupervised classification and cluster analysis to classify land cover. The dataset includes cover type and density classes and forest structure height and volume information based on Landsat imagery collected from 2007 to 2013. Mapping was done at a scale of 1:250,000 and was refined through field evaluation by the GNWT (NRCan and GNWT, 2017). Detailed land cover classification methods for this Project are in the Vegetation and Wetlands TDR (K’alo-Stantec, 2022b; Appendix 18A).”</p> <p>There is an absence of information on recent field verification/validation of land cover classification. Ground-truthing</p>	<p>ECCC request the Proponent:</p> <p>Clarify the age of the data-sources used to derive land cover classes. Confirm whether or not the data originates in whole or in part from the 2007-2013 dataset. Describe the confidence in the accuracy of the landcover classifications, taking into account its age.</p>	Please see the attached document.

		<p>allows for the verification and incorporation of actual conditions on the ground, which may differ significantly from what is observed via Geographic Information System (GIS) data collected one-and-a-half decades earlier. A 2013/2017 dataset (derived from this ~15-year-old data) appears to have been used to inform the spatial modelling for migratory bird species and their potential habitat.</p> <p>For migratory birds, the time of year when imagery is collected to create habitat classifications (typically August/September) often doesn't match the critical breeding time of year the migratory birds when they make decisions based on water or vegetation availability (typically April-June). Furthermore, habitat classifications in the North are often skewed towards large mammals, or forestry (tree) type, and may not have the class breakdowns appropriate for assessing value to migratory birds.</p> <p>The Northwest Territories fire-season in 2023 caused significant changes to the landscape and may have had effects on available land cover types in the Project area.</p> <p>If geospatial data/land cover classifications are inaccurate, there may be over/underestimation of effects to migratory bird species.</p>	<p>Provide an analysis on how the time gap (from year dataset was collected to anticipated year of construction) accurately considered potential change in species demographics, accelerated effects of climate change, and recent (e.g. 2014, 2023) forest fires.</p> <p>Given the data is not current and likely does not represent the current state of land cover classes, collect current field data and/or verify the accuracy of the data-sources used in the field. If current data will not be collected, then</p>	
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			<p>discuss the uncertainty around the effects predictions, mitigation measures and follow-up monitoring/adaptive management.</p> <p>Provide justification on the appropriateness of, applicability to and validity of the land cover classes for migratory birds. Explain how the land cover classes used are biologically appropriate for migratory birds. Clarify the date(s) when the imagery was taken to derive the land cover classes.</p> <p>Use updated/current</p>	
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			<p>satellite/GIS data to classify habitat in order to reflect the above noted concerns. If up to date information will not be used, then explain how the above concerns are addressed with the information presented in the DAR.</p> <p>Update the land cover classes to reflect the changes to the landscape due to the 2023 wildfires. If the land cover classification will not be updated, then provide a discussion on the strength of the assessment in the absence of this information, and how accurately it can identify effects</p>	
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			and mitigation measures.	
36	<p>ECCC-15: Clarity and Error Correction for Bird Groupings- DAR Vol. 3, App. 20A, Sec. 3.2.2, App. 20C</p>	<p>The developer uses a variety of terms to group bird species in the Developer’s Assessment Report (DAR). These terms and how species are grouped into them are used inconsistently and often incorrectly. For example (not an exhaustive list):</p> <p>Section 3.2.2. of Appendix 20A (Birds and Bird Habitat Technical Data Report) incorrectly lists terns as a type of shorebird Appendix 20C (2022 Avian Survey Report), Appendix B, Table B.4 incorrectly lists gulls and jaegers as shorebirds (page B.8-B.9) Appendix 20C (2022 Avian Survey Report), Appendix B, Table B.4 duplicates the use of certain names for grouping birds: waterbirds is used as a Group for many species on Table B.4, and also referred to waterbirds as an Order on the same table. Appendix 20C (2022 Avian Survey Report), Appendix B, Table B.5 also lists waterbirds such as bitterns, coots and cranes as shorebirds.</p> <p>The inconsistent and incorrect classifications may cause confusion amongst parties reviewing the Project for its potential effects during the environmental assessment.</p>	<p>ECCC requests the Proponent:</p> <p>Clearly define terms used to describe bird groupings for clarity and consistency, using biologically understood and standardized nomenclature (e.g. landbirds, waterfowl, waterbirds, shorebirds). Avoid double-grouping species or using terms twice that could have different meanings (e.g. using waterbirds as a large group, then true waterbirds as the order). Update all applicable sections of the DAR (including appendices) to ensure that</p>	<p>The bird groupings used in the Developer’s Assessment Report (DAR) (Section 20, Birds and Bird Habitat), Appendix A (Bird and Bird Habitat Technical Data Report [TDR]) as well as Appendix C (2022 Avian Survey Report) were developed to support the assessment and do not necessarily reflect taxonomic classifications. Section 3.2.2.2 of the TDR describes the approach by stating that bird families that represent species groups including waterfowl, shorebirds and waterbirds are referred to as “waterbirds” (i.e., waterbirds were used as a larger species group for the purpose of the assessment that included wetland and water dependent birds with potential to occur in the Regional Study Area). In addition, taxonomic classifications of bird species do not necessarily align with Indigenous and local knowledge where waterfowl and breeding duck habitat can be referred to separately (Sahtú Land Use Planning Board, 2023), or where harvested species might be referred to as ducks and geese but not necessarily waterfowl (Sahtú Renewable Resources Board, 2021).</p> <p>The Government of Northwest Territories (GNWT) acknowledges that bittern (Order Pelecaniformes), coots and cranes (Order Gruiformes) are typically not classified as shorebirds based on taxonomy, but they are included in the species group called waterbirds for the purposes of the assessment. However, it is generally accepted that terns, gulls and jaegers are included in the Order Charadriiformes (shorebirds) (Chesser et al., 2024). Nonetheless, as stated above, all birds associated with water were considered waterbirds for the purpose of the assessment.</p> <p>The GNWT respectfully submits that updating bird groupings in the DAR and associated appendices for the purpose of the assessment is not necessary to conclude on significance of</p>

			these terms are used consistently.	residual effects. Any changes to taxonomic groupings would not alter the conclusions of the assessment.
37	ECCC-16: Inconsistencies in Appropriate Setbacks for Lesser Yellowlegs, Other Species- DAR Vol. 2, Sec. 3.2.2.6, Vol. 3, App. 20A; Vol. 3, App. 20B	ECCC acknowledges the use of Lesser Yellowlegs as a species of focus for the Proponent, given that they are generally known as an umbrella species with behaviour and habitat use that encompasses many other boreal shorebirds. In Appendix 20A: Birds and Bird Habitat Technical Data Report, the nest setback distance for development activities proposed is stated to be 100 m for general development, and 50 m from pedestrian or All-Terrain Vehicle (ATV) activities. In Appendix 20B: Recommended Activity Restriction Guidelines for Sensitive Bird Species, the Proponent lists the nest setback distance of 300 m for Lesser Yellowlegs. Setback distances should be adjusted to the activities causing the greater amounts of disturbance, and reflect the degree of tolerance of the species.	ECCC requests the Proponent: Provide a biologically relevant justification for the use of the setback distance(s) proposed in Appendix 20A/B. Include a scientifically defensible rationale that incorporates application of the setback distance(s) based on activity disturbance levels Ensure any inconsistencies regarding setbacks in the DAR (namely in the above noted appendices 20A and 20B) are resolved/correct	The recommended setback distances for lesser yellowlegs (<i>Tringa flavipes</i>) in the Developer's Assessment Report (DAR) reflect information and recommendations outlined in NWT specific guidelines as well as professional judgment. The Government of Northwest Territories (GNWT) (2020) recommends a 100 metre (m) setback for lesser yellowlegs nests, whereas the Northern Land Use Guidelines (GNWT 2015) provide recommended setback distances for species at risk bird nests that vary from 200-350 m. The draft Wildlife Management and Monitoring Plan ([WMMP] Volume 5 of the DAR), recommends a setback distance of 300 m from nests of lesser yellowlegs between May 1 and August 31 (Appendix C). The GNWT will develop and apply an appropriate setback distance to active nests of lesser yellowlegs in consultation with Environment and Climate Change Canada – Canadian Wildlife Service that reflects Project-related construction disturbance levels, as needed. Any mitigation measures that have been developed or updated related to nest setback distances for lesser yellowlegs will be provided in subsequent versions of the draft WMMP following regulatory consultation.

			ed and transferred/applied to any management plans (such as the Draft Wildlife Management and Monitoring Plan [WMMP]) appropriately.	
38	ECCC-17: Emergency Response Plan Training Regimen's Periodicity-DAR Vol. 5, Sec. 7, P. 17, Sec. 1.6	The Proponent mentions staff training on various aspects of the Management Plans, as outlined in the Draft Emergency Response Plan Framework and Draft Spill Contingency Plan. However, the Proponent does not address the frequency of these training sessions. Establishing an appropriate training schedule is crucial to ensure that staff are consistently updated on any revisions to these plans and remain well-informed about the appropriate response measures in the event of an accident or malfunction. Considering the construction timeline that extends far into the future, considerations for frequency of the training regimen in-place will help reduce the probability and environmental impact of spills.	ECCC requests the Proponent establish a training regimen with defined periodicity.	The Contractor(s) selected by the Government of Northwest Territories (GNWT) to construct the Project will be responsible for complying with all permits and licences, including the requirements of each of the management plans. The GNWT agrees that the Contractor will be required to train personnel on the purpose and procedures provided in each of the Plans. The methods and frequency of such training and review of the plans will be at the discretion of the Contractor and the GNWT. For example, training is provided as part of orientation for new personnel, and a review may be required annually. Additional training may be required if there is a change in a procedure identified within the Plan, after an accident or spill or if a non-conformance with the plan is identified.
39	ECCC-18: Land Use Change-Response to DAR Review Comment ECCC-4	ECCC has determined that the Proponent has used a Tier 1 approach to estimate the emissions from land-use changes. Though the Proponent stated they are using a Tier 2 approach, the biomass default values from Intergovernmental Panel on Climate Change (IPCC) documentation used is considered Tier 1. Based on the size of the land being impacted and the carbon sensitivity of the land, a minimum Tier 2 approach should be used and specific regional values for the biomass and land characteristics should be incorporated. In addition, the wetland soil organic carbon (SOC) values used in Table 22.3 appear low for the land type.	ECCC requests the Proponent: Use a minimum a Tier 2 approach to estimate emissions from land-use changes as per the Federal	Please see the attached document.

			<p>Strategic Assessment of Climate Change (SACC) and the Technical Guide, and incorporate specific regional values for the biomass and land characteristics.</p> <p>Review the wetland SOC value used in Table 22.3, and provide either an updated value or justification for the value used.</p>	
40	ECCC-19: Carbon Sinks-Response to DAR Review Comment ECCC-5	<p>The methodology used for the calculation of the carbon sinks is missing information and details, and there are some inconsistencies with the carbon sink emission factor used. It is not clear how the carbon sinks emission factor was determined from the source listed (Kurz et al. 2013). The carbon accumulation rate for only forested areas was provided (non-forested ecosystems have not been included in the calculations), however the carbon accumulation for the wetland areas should also be considered. As per the Strategic Assessment of Climate Change (SACC), the carbon sinks evaluation should not be included in the calculation of net GHG emissions (only land-use change should be included in net GHG emissions, carbon sinks are considered separately). Due to the size of the Project area, site-specific or region-specific values should be used for the carbon sinks calculations.</p>	<p>ECCC requests that the Proponent update the carbon sink assessment and provide:</p> <p>reference to the draft Technical Guide Related to the SACC: Guidance on quantification of net GHG</p>	Please see the attached document.

			<p>emissions, impact on carbon sinks, mitigation measures, net-zero plan and upstream GHG assessment, section 4 for calculation methods for carbon sinks.</p> <p>forest age and class when calculating the carbon sink potential of the forest that overlaps with the Project footprint</p> <p>more site-specific land and vegetation data as per the SACC and the Technical Guide, by incorporating specific site or regional values (through a literature review or field measurements).</p>	
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			<p>regional values (through a literature review or field measurements).</p> <p>an outline of how the carbon sink emission factor was determined from the source provided. The carbon sink emission factor should be phrased in terms of carbon (C), not units of gas or CO₂e, and on a per-year basis.</p> <p>application of carbon sink rates for other land-use change classes (such as wetlands) for non-forested areas.</p> <p>the method(s) used in the Technical Guide, where the carbon sink rate</p>	
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			<p>should be multiplied by the default of 100 years.</p> <p>calculation of the natural carbon sink capacity of the Project footprint, and the sum of this lost carbon sink capacity (measured as carbon emissions or removals) for each type of land, not only forested areas. Include the method(s) used, land and vegetation data, and all assumptions made for both construction and operations.</p>	
41	ECCC-20: Collecting Baseline Data for Water and Sediment Quality- DAR	There is a shortage of data necessary to establish existing conditions of water and sediment quality. The Proponent argues that it is not necessary to collect additional baseline data because: they could not model effects on the aquatic environment from a non-point source such as the highway, they are proposing the use of mitigation measures that are well known to be effective, and	<p>ECCC requests the Proponent:</p> <p>Describe how they will collect baseline water</p>	Please see the attached document.

	<p>Vol. 3, Sec. 16, 16.5.2.3, App. 16A, Sec. 3.2.3; Response to DAR Review Comment ECC-16</p>	<p>water quality monitoring for turbidity would occur during construction activities.</p> <p>The Developer’s Assessment Report (DAR) states “Project-related effect pathways relevant to surface water and sediment quality are directly associated with the development of the Project and will not persist into operation.”</p> <p>ECCC does not agree with this conclusion because effects to the aquatic environment next to the road might occur beyond the construction period, including: from dust lifted by highway traffic increased runoff from the road, and; dust suppressants like calcium chloride</p> <p>While it is unfeasible to sample and make measurements of every creek along the highway alignment, it would be relevant to characterize baseline water and sediment quality at water crossings in sensitive areas (such as near wetlands) and those that are of cultural importance. This data will be necessary to confirm if mitigation measures are effectively preventing impacts to the aquatic environment.</p> <p>Water quality data available for sites in the region from the Canadian Aquatic Biomonitoring Network were not included in the list of water quality data sources discussed in Technical Data Report Surface Water and Sediment Quality. Given the paucity of data on water quality presented as baseline data, this data source should be considered unless there are factors which render it unusable.</p>	<p>and sediment quality data at water crossings in sensitive areas and areas of cultural importance.</p> <p>Consider including Canadian Aquatic Biomonitoring Network water quality data available for sites in the area in their baseline data.</p>	
42	<p>ECCC-21: Surface Water Contamination at Material Sources- DAR App. 16A, Sec.</p>	<p>The Surface Water and Sediment Quality Technical Data Report includes the statement “the potential for existing and future material sources to influence surface water quality in the [Regional Study Area] RSA is not well understood.” Despite this poor comprehension, the Developer’s Assessment Report (DAR) concludes “Cumulative effects on surface water and sediment</p>	<p>ECCC requests the Proponent: Describe which aspects the potential for</p>	<p>The potential for material sources (e.g., borrow sources and quarries) to impact surface water are not well understood because there may not be a pathway of effects between the quarries and surface water. That is, the hydraulic connectivity between the material sources and watercourses has not been established at each individual borrow source or quarry.</p>

	<p>3.2.3.1, Vol. 3, Sec. 16, Sub-s. 16.5.4</p>	<p>quality are characterized as ‘neutral’ in direction and low magnitude.” It is not clear how this conclusion was reached.</p> <p>There is potential for material sources to impact the aquatic environment, including through increased sedimentation and leaching of nitrogen compounds from blast residue. It is necessary to understand influences of material sources to surface water quality to evaluate effectiveness of proposed mitigation measures. This must be done before it is possible to assess residual and cumulative effects.</p>	<p>material sources to impact surface water are not well understood, and what is proposed to reduce the uncertainty in this area.</p> <p>Justify how the conclusion of neutral and low magnitude cumulative effects was reached, given the uncertainty.</p>	<p>However, for the purpose of assessing potential effects, the Developer’s Assessment Report’s (DAR) effects assessment (and associated mitigations) assumed that the effect pathway will exist (i.e., that hydraulic connectivity will exist between quarries and watercourses). Therefore, the characterization of residual and cumulative effects (which were assessed as being neutral in direction and low magnitude effects) accounts for this effect pathway.</p> <p>The above uncertainty with respect to hydraulic connectivity will be addressed in the Quarry Development Plans (QDPs) that are part of the Quarry License application process. The QDP for each material source will include details concerning the quarry layout, the drainage pathway(s), the phasing of the quarry’s development, the locations of stockpiles, water management approaches, closure approach, Erosion and Sedimentation Control Plan, Explosives Management Plan, and Spill Contingency Plan. The QDPs will also include specific mitigations and best management approaches for the protection of freshwater sources.</p> <p>The Government of Northwest Territories (GNWT) agrees that there is potential for material sources to impact the aquatic environment, including through increased sedimentation and potential leaching of nitrogen compounds from blast residue (due to incomplete combustion of explosives during quarry development). In addition to the mitigations and best management approaches outlined in the DAR to reduce or eliminate Project-related effects to surface water and sediment quality (including from streambank erosion and potential leaching of nitrogen compounds from material sources, etc.), a limited surface water and sediment quality monitoring program will be considered for culturally important waterbodies and drinking water locations along the highway and/or quarry sites. The potential monitoring locations and monitoring objectives will be identified as part</p>
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				of the GNWT's engagement program with Indigenous Governments, Indigenous Organizations, and other affected parties.
43	ECCC-22: Mitigation of Nitrogen Loading Due to Use of Explosives- DAR Vol. 3, Sec. 16, Sub-s. 16.4.2.2.4; Response to DAR Review Comment ECCC-14	Both the Developer's Assessment Report (DAR) and Proponent responses propose a list of mitigation measures at quarries to reduce nitrogen compound loading from explosives residue in freshwater that includes: "To the extent possible, blasting activities will be completed during winter months to avoid freshet runoff." It is not clear how this mitigation measure would be effective, since residue would remain on the rock and snow during the winter until it was washed out with freshet. Spring runoff would then potentially have higher concentrations of nitrogen compounds which would have to be monitored and managed appropriately.	ECCC requests the Proponent explain how blasting in the winter months would reduce the extent to which residue rich in nitrogen compounds enters surface water during freshet.	As described Section 16.4.2.2.4 of the Developer's Assessment Report, the use of Ammonia Nitrate Fuel Oil (ANFO) explosives is anticipated for the development of quarries and highway materials. The undetonated nitrogen component of the explosives, is highly water-soluble. The use of ANFO explosives may result in releases of nitrogen (which can be detected as nitrate, nitrite, and ammonia) from quarries and quarry materials to the aquatic environment. Blasting-related nitrogen compounds can enter waterbodies through spillage (during the loading of blastholes or during transportation), by the movement of water through the blasthole, by the erosion of explosives from flowing water through the blasthole, and by leaching of undetonated explosive from the blast rubble and quarry materials. Consistent with mitigation measures described in the Explosives Management Plan of the Inuvik to Tuktoyaktuk Highway Project (EGT Northwind, 2013), to the extent feasible, blasting activities will be completed during winter months prior to freshet runoff. The intent of this mitigation measure is to reduce the potential for moisture in the blastholes. This risk is reduced in the winter, when conditions are generally dry and/or frozen. Other proposed mitigation measures are to keep blastholes free of water, and to keep explosives sealed and dry to avoid incomplete detonation that can occur when blast holes contain water, or if ANFO becomes wet. Explosives management and mitigations will be addressed in detail in the site-specific Quarry Development Plans that are part of the Quarry License application process.
44	Government of Canada Submission	Cover Letter for Information Request		

	Cover Letter			
45	DFO-11 Attachment 2	Attachment for DFO-11		
No.	Topic	Reviewer Preamble	Reviewer Request	Response
Deline Renewable Resources Council - Ms. Stephanie Kearns				
1	Evaluating Cumulative Effects	<p>A stated goal of the DAR was to evaluate the potential for the Mackenzie Valley Highway Project to contribute to cumulative effects for a range of Key Lines of Inquiry (KLOIs), Valued Component (VCs), and other considerations. Mention of consideration, evaluation, and mitigation of potential contributions of cumulative effects is commonplace throughout the DAR; indeed, the term “cumulative effect” occurs 1,319 times in the DAR.</p> <p>Section 4 in the DAR details that cumulative effects are assessed as potential “Additional incremental effects resulting from residual effects of the Project combined with the effects of reasonably foreseeable future and certain current projects and activities...” (section 4.6). Effects are measured against a baseline of existing conditions (section 4.4), and interpreted as the severity, likelihood, and direction that accumulating effects contributed by the Project and other subsequent change that cannot be reasonably addressed or controlled with known mitigation measures may interact to exert change (sections 4.5, 4.6.2, 4.6.3, 4.6.4, and 4.7). In this case, the timeline across which cumulative effects are considered is forever because the operation and maintenance phase of the Project is “...indeterminate as the highway is intended to be permanent infrastructure.” (section 4.3.3.2).</p> <p>The Délı̨nę ʔehdzo Got’ı̨nę (also known as the Délı̨nę Renewable Resources Council, “DRRC”) notes three concerns with the DAR’s approach to cumulative effects assessment for this Project. First, the baseline data used to assess existing conditions for environmental considerations is not comprehensive and not reflective of our experience. Overall, very little data were used to assess existing conditions, and most of that information was</p>	<p>1.1 Please provide the basis upon which the GNWT determined that a static baseline of existing conditions would be considered sufficient on which to evaluate future changes associated with cumulative effects contributed by the Project.</p> <p>1.1.a. What steps is the GNWT taking to gather additional information on ecological trends, natural cycles, and past and ongoing changes so that</p>	Please see the attached document.

	<p>collected by the GNWT or their consultants. Virtually no consideration was given to Dene ts'įł, Sahtúot'įne experiences or Sahtúot'įne perspectives on animals and habitat, or to the well known ebbs and flows of animals on the landscape (e.g., population dynamics and wildlife space use, landscape and habitat conditions, and natural cycles of environmental conditions). For example, Appendices 12A, 13A & B, 14A, 15A & B & C, 16A, 17A, 18A & B, 19A, 20A & C) list the data used to determine existing environmental conditions; few of those resources are from Indigenous participants, and virtually none are from Délįne.</p> <p>The second concern the DRRC has with the DAR's approach to cumulative effects assessment is the "forever" timeframe across which cumulative effects were considered against what the DAR considered to be reasonable and foreseeable future development. Section 26.2.1 considers future projects to be reasonably foreseeable if they "(a) have obtained the necessary authorizations to proceed or are in the process of obtaining the required authorization, or (b) have been publicly announced with the intention to seek the necessary authorizations to proceed". The DAR then suggests there are no reasonably foreseeable projects that will exert significant, adverse cumulative effects that interact with the Highway Project. This seems disingenuous. Even a casual reading of the news points to a broad Canadian interest in developing critical minerals and hydrocarbon resources. Indeed, Appendix 1A lays out the Business Case for the Project, and in various locations the DAR points to the Project as explicitly supporting further exploration and development activity. For example, Section 9.9.5.12 states: "Operations and maintenance of the Project as a all-season form of ground transportation may cause changes in a number of non-traditional resources within the LAA and perhaps RAA, including minerals, oil and gas industries. In particular, oil and gas claims in the Norman Wells – Tulita axis as well as lands with high hydrocarbon potential throughout the Sahtu Region may be spurred to develop due to the Project. Operations and</p>	<p>the MVEIRB and parties can have a longer-range understanding of baseline conditions under the rapidly changing conditions associated with climate change?</p> <p>1.2 Please provide the GNWT's rationale for not using Dene ts'įł and other Indigenous Knowledge to establish past and current conditions.</p> <p>1.3 How will the GNWT measure the effects of the project relative to additive and multiplicative effects of: 1.3.a. Climate change, and 1.3.b. Wildfires and changing wildfire</p>	
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	<p>maintenance of the Project will make the development of mineral/oil and gas opportunities (via oil and gas rights and mineral rights) more affordable and therefore more likely. Norman Wells has a long history of oil extraction and production; and there is moderate/low hydrocarbon potential directly surrounding the Hamlet of Tulita. In terms of minerals, there is an undeveloped lead and zinc deposit located 10 km southwest of Wrigley. Though mineral exploration and extraction has been low in the Sahtu Region, the greater region includes four geological provinces (Arctic Platform, Bear, Cordillera and Interior Platform) with lead, zinc, iron, copper, silver, uranium, lithium, cobalt, diamonds, tungsten and emerald potential. Tulita and Norman Wells are found within the Interior Platform geological province. Additional details on existing resource use are provided in Appendix 9C, Section 5.1.</p> <p>To date only a small fraction of the proven mineral, oil and gas reserves have been developed in the Sahtu Region, largely for economic reasons. Colville Lake community members believe the Project will allow for easier access to mineral resources, and individuals from Norman Wells feel it will be more economical for companies that have mineral rights in the Sahtu Region.”</p> <p>The assertion in the cumulative effects sections that the Project will not have ramifications for additional land use change is inconsistent with these statements about the road clearly opening up the area to development.</p> <p>The third concern the DRRC has is that the DAR gives little attention to monitoring for cumulative effects or changes associated with the Project. Section 23 describes that, in essence, “monitoring will occur”. Specifically, Section 23.5 states that for environmental concerns, “...effects monitoring to verify the accuracy of predictions and implemented mitigation measures” is to occur, but provides little detail about what will be monitored, how things will be monitored, when monitoring is to occur, or specifically what triggers a monitoring need (section 23.6). More</p>	<p>patterns?</p> <p>1.4 Please provide the GNWT’s rationale for the DAR statement that the Project will not directly contribute to additional land use change associated with resource exploration and development given the evidence that a road will clearly open up the Sahtú to development.</p> <p>1.5 Please detail, explicitly, how the GNWT will include the perspectives of the DRRC and Sahtúot’jné harvesters in continuous monitoring to evaluate and interpret environmental</p>	
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		<p>importantly, it is unclear from the DAR what actions may be taken or when any actions may be triggered in cases where unintended or unforeseen cumulative effects are observed. In discussing assessment of cumulative effects on socio-economic VCs, Section 9.13 states, "Readers are therefore advised to consider the cumulative effects assessment as being based on the information available at the time of the assessment and may require reassessment when the timing of the project construction and other reasonably foreseeable projects and activities are known in more detail".</p> <p>Simply stating that monitoring will be done is not enough, we need a clear monitoring plan in place for how, when and by whom monitoring will be done and what baselines are being used for each element to assess cumulative impacts.</p>	<p>change and cumulative effects associated with the Project.</p> <p>1.5.a. In particular, please provide details on what will be monitored, and how and when monitoring will occur.</p> <p>1.5.b. How does the GNWT plan to engage with and directly involve the DRRC, the Délı̄ne Got'ı̄ne Government (DGG), and Sahtúot'ı̄ne harvesters to develop monitoring plans and protocols, collect information, and interpret change as it relates to cumulative effects?</p>	
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			1.6 Please detail the funding and capacity support that the GNWT plans to provide to the DRRC and the DGG to participate in ongoing monitoring related to cumulative effects.	
2	Holistic perspective and management of the land	<p>The Mackenzie Valley Highway Project -Developer's Assessment Report (DAR) considers the potential for the Mackenzie Valley Highway Project to impact a range of Key Lines of Inquiry (KLOIs), Valued Component (VCs) (Sections 10 and 12 -21, inclusive, and Appendices 12A, 13A & B, 14A, 15A & B & C, 16A, 17A, 18A & B, 19A, 20A & C). The DAR also discusses a range of potential mitigation actions to address potential concerns and impacts in the aforementioned sections as well as in various Wildlife Management and Monitoring Plans (WMMPs; which are to be developed still) mentioned throughout (and see Appendices 19B and 20B).</p> <p>The Délı̨nę ʔehdzo Got'ı̨nę (also known as the Délı̨nę Renewable Resources Council, "DRRC") appreciates this effort because all components of an ecosystem, including a range of wildlife species, their habitats, and various ecological cycles that can influence wildlife and their habitats, are important considerations. The DRRC also believes that land stewardship is not simply about one or two important factors or indicators – all species are important and deserving of wise stewardship.</p> <p>While the DAR did consider a range of values, the DRRC is</p>	<p>2.1 What are the GNWT's plans to establish improved baseline information to better capture a longer-range view of what a healthy ecosystem looks like?</p> <p>2.2 How will the GNWT work collaboratively with the DRRC and the Délı̨nę Got'ı̨nę Government (DGG) to leverage the</p>	Please see the attached document.

	<p>concerned that for many other values, insufficient information is available and Dene ts'ı̨ı̨ and other available Indigenous Knowledge have not been used to inform a meaningful evaluation of the impacts potentially associated with the Project for those values. In many cases population abundances and dynamics are simply unknown (e.g., for many fish species, furbearers, beavers, etc.), broadly estimated using models (e.g., for songbirds), or derived from infrequent, localized estimates that may not be relevant to other areas (e.g., caribou and moose). How can impacts and change be adequately evaluated if baselines are unknown or only coarsely known?</p> <p>Further, the DRRC is concerned that the overall approach to evaluating impacts and cumulative effects associated with the Project is too narrowly focused on individual values in a vacuum and is a western-science driven research and monitoring agenda that is not inclusive of Indigenous perspectives of the land. The land is complex, but understanding and monitoring such complexity is at the core of meaningful and actionable monitoring and decision making. Informed and effective land management decisions are dependent on understanding and addressing ecological complexity, which must be done not just from a western science perspective but also from a Sahtúot'ı̨ı̨ perspective. While Sections 4, 10, 11, 17 - 21 do describe attempts to address interactions among values, there is an overall lack of clarity and specificity about how this will be achieved. Importantly, the DRRC is not clear how the DRRC and Sahtúot'ı̨ı̨ Harvesters will be directly involved in research and studies, despite this being mandated by section 13.8.40 of the Sahtu Dene Metis Comprehensive Land Claim Agreement (SDMCLCA). Section 2 simply states engagement is to occur and indicates that Indigenous environmental monitors are to be used and employed.</p> <p>The DAR relies on a baseline that is a snapshot in time (Section 3.0 or 4.0 (Methods) of each Technical Data Report (TDR) for each of the VCs in Volume 2 and 3 (specifically, sections 10 and 12 -21,</p>	<p>Project to fully implement our Caribou Plan?</p> <p>2.2.a. How, specifically, will the GNWT integrate the strategies and ideas in our Caribou Plan with WMMPs to achieve multiple goals for monitoring?</p> <p>2.3 How will the GNWT ensure data and information are collected to meaningfully monitor wildlife in a way that centers on Sahtúot'ı̨ı̨ approaches and perspectives and Sahtúot'ı̨ı̨ considerations for what constitutes healthy habitat and wildlife populations?</p>	
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	<p>inclusive) and Appendices 12A, 13A & B, 14A, 15A & B & C, 16A, 17A, 18A & B, 19A, 20A & C, 22A, and 24A). This ignores the variations that occur overtime. To adequately assess impacts to VCs, we need a much broader, longer-range baseline that looks at variations over time and includes both western science and Dene ts'ı́ı, which has been developed over many generations.</p> <p>Within the Sahtú, there are a range of documents and strategies that outline how more meaningful and locally and culturally appropriate land stewardship can occur, such as the Sahtú Land Use Plan (2013), the revised Sahtú Renewable Resources Board Strategic Plan (2020-2025), and “Belare Wíle Gots’ę ʔekwé – Caribou for All Time – A Délı́ne Got’ı́ne Plan of Action” (the ‘Caribou Plan’). The Caribou Plan was first adopted by the Délı́ne Got’ı́ne Government (DGG) in 2016 and the GNWT approved the Caribou Plan in February 2017. The Caribou Plan contains many of our Dene ʔeʔa (laws) related to wildlife and habitat and charts a path for monitoring and stewardship. While we understand that some of those pre-existing documents were used to guide the assessment of impacts (i.e., Section 4.3.2) and to reroute Project locations and/or include stricter mitigation considerations in certain areas (i.e., Section 5.2.3, Table 5.2; and Sections 6.2 and 6.3), more work must be done to ensure that the existing documents and Sahtúot’ı́ne perspectives are fully integrated into the monitoring and WMMP development that is to occur during the construction and operation and maintenance phases of this Project.</p>	<p>2.3.a. How will the GNWT integrate Dene ʔeʔa in monitoring and data collection plans so that information on wildlife is collected in appropriate ways? For example, the DRRC has repeatedly expressed to the GNWT its concerns about the impacts of collaring and helicopter monitoring activities on wildlife.</p> <p>2.3.b How will the GNWT ensure that data and information that is collected with the participation of the DRRC and DGG is fed back into the broader monitoring</p>	
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			<p>mechanisms to evaluate and address unforeseen or unintended impacts and cumulative effects of the project?</p> <p>2.3.c. How will the GNWT ensure that (i) monitoring, (ii) evaluation of impacts of the project, and (iii) adapting mitigation measures is done in a way that protects our Aboriginal and treaty rights and our Dene ts'ı̨l̨.</p> <p>2.4 What financial and capacity supports will the GNWT provide to the DRRC to enable us to (i) participate in study design, (ii) conduct</p>	
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			<p>monitoring, (iii) engage and advise on research and study questions, and (iv) participate in the process to assess impacts and adjust mitigation measures as needed?</p> <p>2.4.a. If the GNWT and the DRRC disagree about the interpretation of data collected or how to interpret the information collected, how will those disagreements be resolved?</p>	
3	Impacts to and Mitigations for Caribou and Moose	<p>Caribou, including boreal caribou ecotype of woodland caribou (<i>Rangifer tarandus caribou</i>) and barren-ground caribou (<i>Rangifer tarandus groenlandicus</i>) of the Bluenose-East herd, and moose (<i>Alces alces</i>) have been identified as a valued component (VC) for the evaluation and mitigation of potential impacts in the DAR because of their importance to people and their potential to be affected by the construction and operation of the Mackenzie Valley Highway (i.e., DAR, Section 10). The assessment of effects on these animals is considered a Key Line of Inquiry (KLOI) in the DAR.</p> <p>The DAR supposes that while there may be a range of impacts to</p>	<p>3.1 Please explain why the GNWT did not include indirect impacts on caribou and moose in the assessments of thresholds and mitigations in the DAR.</p>	Please see the attached document.

	<p>the ecologies of caribou and moose, including habitat and habitat use (Section 10.4.1.1 and Appendix 10A, and Sections 18 and 19, respectively), movement (and by inference population level connectivity), mortality risk, and health (Section 10.4.1.2, and Appendix 10A), those affects will a) not be significant, and b) that any measurable changes that are observed will be adequately addressed using a range of recommended mitigation measures (i.e., Table 10.7) such that changes will remain within the bounds of expected ecological ranges.</p> <p>The DAR states that “based on the species distributions, the Caribou and Moose LAA adequately captures the potential residual and cumulative effects of the Project interacting with the effects of other past, present, and reasonably foreseeable future projects.” The Déljñę ʔehdzo Got’jñę (also known as the Déljñę Renewable Resources Council, “DRRC”) disagrees with this statement.</p> <p>All potential impacts stemming from the Project, and mitigations thereof, were assessed within both limited spatial and ambiguous temporal scopes. Spatially, potential impacts were assessed within the Project Development Area (PDA; area of direct project disturbance), and a Local Assessment Area (LAA; area within a 15 km buffer from the proposed Project (section 10.1.4.1). This was done, as indicated in section 10.1.4., to “...balance between areas either too large and irrelevant to the scale of the Project, or too small and does not inform on regional habitat conditions.” Further, the 15 km LAA matched ecological parameters (i.e., maximum 24 hr movement distance regionally, and caribou response to road types in northern BC) and other project evaluations (i.e., 15 km was also used during review of Tjchq All-Season Road and the Inuvik to Tuktoyaktuk Highway Projects). Temporally, impacts were assessed, as indicated in section 10.1.4.2 for the highway construction phase (10 years over a 20-year timeframe roughly completed between 2041 – 2046) and for the highway operational and maintenance phase which is “...considered indeterminate as the highway is intended to be permanent infrastructure.” From</p>	<p>3.1.a. Animal populations and distribution change over time and impacts in one area can influence how animals respond in other areas over long time frames and broad spatial scales. For example, Sahtúot’jñę and western scientists alike know that predators like wolves can travel further and faster along linear features such as roads to give them broader access to caribou habitats and increased predation over the long-term and at spatial scales well beyond</p>	
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	<p>both western science and Sahtúot'įnę perspectives both the spatial and temporal scopes do not address the life histories and ecological needs for these species.</p> <p>Further, many generations of Dene ts'įł and, in more recent years, western science has told us that both caribou (boreal and barren ground ecotypes) and moose exhibit complex relationships to their habitats and changes to those habitats and to subsequent changes in species relationships and interactions. All those changes have been shown repeatedly to be driven by both direct and indirect responses to habitat change as well as subsequent feedback loops in animal population change, distribution and habitat use.</p> <p>The DRRC also disagrees with the information being used and how that information is being interpreted to estimate impacts. For example, section 10.2 stipulates that all current evaluation is based on existing conditions for caribou and moose which has been collected largely by the GNWT and other mostly western-science-based criteria (i.e., section 10.2, and the information compiled in the Supplemental Mackenzie Valley Highway Project, Technical Data Report—Caribou and Moose Prepared by EDI). Although the GNWT has incorporated some Indigenous perspectives and available information into decision making (i.e., section 5), it is unclear specifically which information from the DRRC and Sahtúot'įnę harvesters and Elders was incorporated or how it was used and contextualized. Section 10.1.6 describes that the thresholds to determine whether “a significant adverse residual effect” has occurred even after the “application of avoidance and mitigation measures” for measurable impacts on caribou and moose “1) causes or further contributes to the exceedance of a conservation-based threshold; or 2) threatens the long-term persistence or viability of caribou and moose populations in the Caribou and Moose LAA.” Conservation-based thresholds are not an appropriate measurement given the requirements of the Sahtú Dene Metis Comprehensive Land Claim Agreement (SDMCLCA), Dene ʔeʔa (laws) about stewardship, and the Aboriginal and treaty</p>	<p>immediate linear footprints. Please explain why the GNWT did not consider these ecological patterns in the DAR, especially because the road is intended as permanent infrastructure.</p> <p>3,2 What information was considered from the DRRC and Sahtúot'įnę harvesters and Elders in (i) assessing impacts to caribou and moose in the DAR and (ii) evaluation of the efficacy of selected mitigation measures?</p> <p>3.3 Please provide the GNWT's rationale for why a 15 km LAA in</p>	
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		<p>rights in the Sahtú. Further, it is impossible to reasonably account for the long-term persistence or viability of caribou or moose forever into the future using only a snapshot of sparse current data.</p> <p>Lastly, the mitigation measures listed (i.e., Section 5, and each constituent subsection here (i.e., 10.4.2.2, 10.4.3.2, 10.4.4.2, etc.) are hypothetical and narrowly focused on only direct impacts of the Project on caribou and moose (i.e., section 10.3, table 10.6) and assessment of direct of residual effects (i.e., section 10.4, table 10.7). Proposed mitigations may or may not work, and they do not adequately address many indirect effects on caribou and moose caused by roads that have been shown elsewhere. This ignores information from both western science and Dene ts'ı̨ı on how animals respond to development and habitat disturbance, and amounts to a “mitigation guessing game” that assumes almost entirely that untested and unquantified actions can prevent or undo real and known cause and effect relationships. Note also that the Délı̨ı́nı̨ı́ Got'ı̨ı́nı̨ı́ Government (DGG) adopted the “Belare Wı̨ı́le Gots'ı̨ı́ ʔekwı̨ı́ – Caribou for All Time – A Délı̨ı́nı̨ı́ Got'ı̨ı́nı̨ı́ Plan of Action” (the ‘Caribou Plan’) in 2016 and the GNWT approved the Caribou Plan in February 2017. The Caribou Plan contains our Dene ʔeʔa (laws) on stewardship and our relationship with caribou and moose (and other species) and could be a trail-map for how to conduct monitoring.</p>	<p>perpetuity is sufficient to address impacts to caribou and moose.</p> <p>3.4 Assuming measurable impacts are observed in caribou and moose that were not anticipated or mitigations do not work to resolve problems as anticipated, what mechanisms will the GNWT use to enact new mitigation measures?</p> <p>3.4.a. How does the GNWT plan to directly involve the DRRC, Délı̨ı́nı̨ı́ Got'ı̨ı́nı̨ı́ Government and Sahtúot'ı̨ı́nı̨ı́ harvesters in those mechanisms?</p>	
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			<p>3.5 How does the conservation-based threshold (section 10) enable provision of the Sahtu Minimum Needs Level as outlined in the SDMCLCA?</p> <p>3.6 How does the conservation-based threshold relate to the Caribou Plan?</p> <p>3.7 Please explain how the GNWT considered Sahtuot'jne perspectives and Dene ts'ı̄l̄ı̄ in deciding that a conservation-based threshold was an appropriate threshold to use.</p> <p>3.8 Given the GNWT's</p>	
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			<p>obligations under section 13.8.40 of the SDMCLCA to directly involve the RRCs and harvesters when the GNWT conducts wildlife research or harvesting studies, what process does the GNWT intend to use to include the DRRC and Sahtúot'įnę harvesters in monitoring the effects of the project?</p> <p>3.9 What funding and capacity supports does the GNWT intend to provide the DRRC, DGG, and Sahtúot'įnę harvesters to ensure they can effectively directly participate in</p>	
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			<p>research and monitoring related to the impacts of the project?</p> <p>3.10 How will the GNWT incorporate the ideas and strategies outlined in the Caribou Plan into the monitoring of effects of the project and adapting mitigation measures based on what is found?</p>	
4	Adequately responding to changes to hunting and harvest pressure	<p>The Mackenzie Valley Highway Project - Developer's Assessment Report states that "For harvesting and land use, the Project will provide all-season access to areas previously only accessible in winter. This is likely to facilitate hunting, fishing, plant gathering, and access to cultural resources. This may increase harvest pressure on certain species..." (Section 8.3). Further, the DAR states that "...increased access may lead to overfishing, which could lead to a significant effect if not managed properly" (Section 8.3). The Délı̨ne Ɂehdzo Got'ı̨ne (also known as the Délı̨ne Renewable Resources Council, "DRRC") is concerned that all-season access could result in additional harvesting and changes in harvest patterns of caribou, moose, fish and other species, which may negatively impact wildlife populations and the availability of harvesting for Sahtúot'ı̨ne harvesters.</p>	<p>4.1 How does the GNWT plan to evaluate the relationship between changes in hunting pressure and success and subsequent changes in caribou, moose, and fish populations and population</p>	<p>Please see the attached document.</p>

	<p>The DRRC has two primary concerns about potential change and subsequent management of harvest. First, we are concerned that the baseline understanding in the DAR of moose, caribou, and fish is incomplete and has not sufficiently considered Dene ts'ı̨ı̨, especially Sahtúot'ı̨ı̨ knowledge. The DRRC also notes that information on caribou and moose abundance, density, and population dynamics is patchy and sporadic in the DAR (Section 10.2 and Appendix 10A), and that little information on these parameters is available at all for fish (Section 11.2.2.2 and Appendix 11A). This makes it difficult to understand and contextualize how any changes in hunting pressure and success may act on residual and cumulative effects for moose and caribou (i.e., Sections 10.4 and 10.5, respectively) and fish as well as other traditional land uses and harvesting (i.e., Section 11.4 and 11.5). In short, the DAR makes some predictions, but they are speculative and largely not evidenced based. Importantly, the full extent of the potential impacts of increased harvesting could not be adequately addressed in the DAR given the limited spatial scopes of evaluation. While the Déłı̨ı̨ District is largely outside of the Local and Regional Assessment Areas (LAA and RAA (for these Valued Components this area is the same), Sahtúot'ı̨ı̨ use and harvest throughout the Sahtú; wildlife also move through and use the entire landscape, regardless of the LAA and RAA boundaries.</p> <p>Our second concern is around how to respond to changes in hunting pressure that may cause changes in caribou, moose, or fish populations. The DRRC understands that hunting tags are used as a way to manage hunting allocation and pressure, but “community members also noted there is some concern among residents about increased numbers of non-residents accessing the area for recreational hunting, as it may lead to adverse effects on wildlife. Increased competition for wildlife could in turn reduce the availability of traditional foods for community consumption and increase reliance on store-bought foods to supplement diets” (Section 8.2.9). It is unclear to the DRRC how the GNWT intends to</p>	<p>dynamics?</p> <p>4.1.a. Specifically, (i) what data and information will the GNWT collect on hunting pressure and hunting success, (ii) how often will that information be collected and (iii) how will it be collected?</p> <p>4.1.b. How will the GNWT use the harvest monitoring strategy outlined in the Caribou Plan to design and deliver harvest research?</p> <p>4.1.c. How will the DRRC, Déłı̨ı̨ Got'ı̨ı̨ Government (DGG), and Sahtúot'ı̨ı̨ harvesters be directly included</p>	
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		<p>limit harvesting by people who are not Sahtú Dene Metis Comprehensive Land Claim Agreement (SDMCLCA 1993) beneficiaries once the road opens to reduce impacts of harvesting, and how the GNWT will respond if monitoring data shows unacceptable changes in wildlife populations or beneficiary harvesting.</p> <p>Under s. 13.8.40 of the SDMCLCA, when the government conducts wildlife research or harvesting studies in the Sahtú, those studies must directly involve the DRRC and Sahtúot'ıne harvesters to the greatest extent possible. The DAR does not explain how the GNWT intends to meet their obligations under the SDMCLCA. Further, the Belare Wıle Gots'ę 7ekwę – Caribou for All Time – A Délıne Got'ıne Plan of Action” (the ‘Caribou Plan’) outlines a harvest monitoring strategy, but the DAR does not make reference to the Caribou Plan or this strategy. The Caribou Plan was first adopted by the Délıne Got'ıne Government (DGG) in 2016 and the GNWT approved the Caribou Plan in February 2017.</p>	<p>in the design and implementation of the harvest research?</p> <p>4.1.d. How and when will harvest data be shared between GNWT and Indigenous organizations and governments?</p> <p>4.1.e. What process does the GNWT intend to use to assess harvest pressure and assess associated impacts of harvest pressure on wildlife populations and harvesting by SDMCLCA beneficiaries?</p> <p>4.1.f. How does the GNWT intend to make decisions on when changes in harvesting</p>	
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			<p>allotments of non-beneficiaries is required to respond to increased harvest pressure and associated decreased wildlife populations or decreased beneficiaries' harvesting?</p> <p>4.1.f.i. Has the GNWT set thresholds for when changes in harvesting allotments will happen?</p> <p>4.1.f.ii. What body of evidence and what level of certainty will be required to make changes to hunting allotments?</p> <p>4.1.f.iii. How will the DRRC and DGG be included in that decision</p>	
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			<p>making process?</p> <p>4.2 How will the GNWT ensure that its wildlife harvesting monitoring and enforcement plans follow the Caribou Plan, including as it may be changed over time, during the construction and operation and maintenance phases of the Project?</p>	
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