



EA 1617-01

Adequacy Statement

Outstanding information needs to
satisfy the *Terms of Reference*

Tłıchǫ All-season Road

Government of Northwest Territories

Department of Transportation

October 28, 2016

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1 OVERVIEW

The Mackenzie Valley Environmental Impact Review Board (Review Board) conducted an adequacy review of the Project Description Report (PDR) ([PR#7](#)) and evidence on the public record submitted by the Government of Northwest Territories – Department of Transportation (GNWT-DoT or “the developer”) in support of its proposed Tłıchǵ All-season Road Project (TASR or “the Project”). This *Adequacy Statement* was written to accompany the Review Board’s *Terms of Reference* (ToR) and outlines the additional information required by the Review Board at this time. As described in the Review Board’s *Notice of Proceeding – TASR Terms of Reference Process* ([PR#44](#)), the purpose of the *Adequacy Statement* is to:

- acknowledge the information and evidence on the public record, including the developer’s PDR;
- avoid duplication, where possible, and focus further investigation on those effects that have the potential for significant adverse impacts on the environment; and
- provide detailed guidance to the developer regarding what further investigation is needed at this time.

This document is divided into the following sections:

Section 2 describes the EA process to date, and the Review Board’s approach to the *Terms of Reference* development process.

Section 3 describes the **general adequacy items** required to satisfy the *Terms of Reference*.

Section 4 describes the assessment **methodology** the developer will use to respond to the detailed adequacy items in section 5.

Section 4.3 provides a list of **detailed adequacy items** for each valued component.

2 BACKGROUND

On July 21, 2016, the Review Board referred the Tłıchǵ All-season Road Project to environmental assessment (EA) on its own motion ([PR#1](#), [PR#2](#)). Prior to referral, the developer had submitted a substantive PDR in support of its application to the Wek’èezhìi Land and Water Board (WLWB) for a Type A land use permit and Type B water licence. As part of the initial review process by the WLWB, the PDR was reviewed by parties and a substantial amount of evidence was submitted through the WLWB’s Online Review System (ORS). This evidence, combined with scoping sessions held by the Review Board after the project’s referral, has allowed the Review Board to identify the issues of primary concern to be investigated in the EA, including those potential project-related impacts that may result in significant adverse impacts to a number of valued components.

The Terms of Reference

The Review Board's approach to the terms of reference for this Project is unique because of the amount and quality of material available to the Review Board upon referral, which included the developer's PDR and information submitted to the WLWB during the preliminary screening. The PDR provides the Review Board with:

- 1) a good understanding of the project;
- 2) an indication of issues related to the project that have the potential to result in significant adverse environmental impacts; and
- 3) a preliminary consideration of mitigation measures proposed to minimize project impacts on the environment.

Typically, the Review Board requires a developer's assessment report (DAR) to be issued in response to the information requirements outlined in the Terms of Reference. For the TASR EA, the Review Board has determined that the GNWT-DOT's PDR will serve as a partial impact assessment, to be combined with the developer's Adequacy Statement Response (ASR). Together these two documents will replace the typical DAR requirement. The *Terms of Reference* therefore only provides the scope of the environmental assessment for the EA (including the valued components to be assessed), and describes the standard information and methodology typically required by the Review Board in an environmental assessment, as outlined in the Review Board's [*Environmental Impact Assessment Guidelines*](#).

The Adequacy Statement

After reviewing the available evidence on the public record, the Review Board has identified where additional information is needed to understand the nature of impacts, their effect on valued components and the residual impacts likely to remain after mitigation measures are applied. The *Adequacy Statement* supplements the *Terms of Reference* and provides detailed guidance to the developer regarding what further investigation is needed at this time.

The *Adequacy Statement* defines what specific information is required to satisfy the Review Board's information requirements. In other words, the Adequacy Statement will ensure that the developer has fulfilled the purpose and intent of the requirements set out in the *Terms of Reference*, with sufficient information for the Review Board and parties to produce meaningful information requests (IRs) and proceed with the EA process as efficiently as possible.

The *Adequacy Statement* will not require further information for issues where, in the Review Board's view, there is sufficient material on the record to move into the information request phase of the environmental assessment. Moreover, in accordance with the Review Board's [*Rules of Procedure*](#), the Review Board and parties can use information requests to pursue specific questions related to any topic within the scope of assessment (including topics that are not covered in the *Adequacy Statement*).

3 TERMS OF REFERENCE GENERAL ADEQUACY ITEMS

The Review Board recognizes that the GNWT-DOT did not have the benefit of referring to the *Terms of Reference* when it was developing its PDR. As such, some standard elements typically required by a terms of reference are not included in the PDR. These standard items are outlined in Table 3-1. **In order to satisfy the information requirements set out in the *Terms of Reference*, the GNWT-DOT must address the adequacy items in Table 3-1.**

Table 3-1 Summary of Adequacy Items

ToR section	Information Adequate? (Yes/No/Partial)	Additional Information Requirements
3. General Requirements		
3.1 Presentation of Material	N/A	Provide all ASR materials according to the instructions in Section 3.1 of the ToR
3.2 Incorporation of TK	Partial	Provide a stand-alone TK summary section in the ASR based on the instructions in Section 3.2 of the ToR.
3.3 Public Engagement	Partial	Reporting on ongoing engagement will follow the instructions in Section 3.3 of the ToR.
3.4 Developer Commitments	N	Provide a table of commitments, based on the instructions in Section 3.4 of the ToR.
3.5 Summary Materials	N	Based on the instructions in Section 3.5 of the ToR, provide: • a plain language summary of the response to the <i>Adequacy Statement</i>; • a concordance table (against requirements in <i>Adequacy Statement</i>); and • an updated list of anticipated authorizations, permits, licenses and other approvals, including any authorizations required from the Tłıchǫ Government, DFO or other responsible authorities that are not already covered in the PDR
3.6 Development description	Partial	Based on the instructions in Section 3.6 of the ToR, provide: • a detailed schedule for project activities (including estimated duration for each activity and any seasonal timing constraints and contingency plans), milestones, and timing of construction based on the estimated schedule; and • an updated description of activities during the operations phase.
3.7 Land Use Plans	Partial	GNWT-DOT needs to state if accessing the borrow sources within the cultural heritage zone will alter the project and list any ensuing impacts that might result to valued components.
3.8 Developer	Partial	Provide information required under item b of Section 3.8 of the ToR.
4 Assessment Methodology	Partial	Project-related effects: refer to sections 4.1, 4.2, and 4.3 of this document for elaboration. Cumulative effects: refer to section 4.3 of this document for elaboration
5 Baseline Info	Partial	Refer to sections 4 and 4.3 of this document for elaboration.
6 Detailed Requirements of Assessment	N/A	Refer to section 4.3 of this document for elaboration.

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7 Cumulative Effects Summary	Partial	Provide a summary of cumulative effects, based on the instructions in Section 7 of the ToR.
8 Follow-up & Monitoring	Partial	Provide a summary, based on the instructions in Section 8 of the ToR.

4 ADEQUACY ASSESSMENT METHODOLOGY

The Review Board evaluated the PDR and evidence on the public record in terms of the assessment methodology outlined in section 4 of the *Terms of Reference* (also attached as Appendix A of this document). In EA, the developer’s assessment of potential impacts generally consists of:

- describing the pathways of effect that link the development to valued components of the environment;
- forming and refining impact predictions with the help of consultation and expert knowledge (including traditional knowledge);
- identifying mitigation measures to reduce or avoid adverse impacts; and
- predicting and characterizing residual impacts.

In this case, the Review Board is generally satisfied with the baseline information and the identification of potential impacts by the developer in their submissions. The Review Board also acknowledges the mitigation measures that have been proposed. Nevertheless, in order to fulfill the assessment methodology set out in Section 4 of the *Terms of Reference*, additional information is needed to assess the identified impacts.

These information requirements correspond to specific steps from the assessment methodology in the *Terms of Reference* and are critical to the EA process. In this case, not all of the impact assessment steps are required for every valued component. Sections 4.1, 4.2, and 4.3 describe the methodology the developer will follow when addressing the information requirements needed for the GNWT-DOT’s Adequacy Statement Response. The specific additional information requirements for Project-related effects are set out in section 5 of this document. The cumulative impacts assessment in section 4.3 applies to all valued components.

4.1 Potential impacts and mitigation measures

The assessment of each Project-related environmental impact begins with a description of the mechanisms whereby specific Project components and activities could result in an impact to a valued component. For each valued component topic identified in section 2.2.2 of the *Terms of Reference*, the developer will clearly describe for all phases of the project:

- the potential impacts that may occur;
- the project component(s) and/or activities to which the impact is linked; and
- how the proposed mitigations will reduce or avoid the potential impact.

The developer will provide a thorough description of the potential impacts and proposed mitigations associated with the adequacy items identified in section 4.3 of this document. The results should be summarized in a table (see example Table 4-1 below).

Table 4-1 Example table summarizing potential impacts and mitigation measures for a valued component

Pathway of effect	Potential impact(s)	Mitigation measure(s)
<i>Describe project component or activity leading to the potential impact</i>	<i>Describe potential impact and how it stresses the valued component</i>	<i>Describe mitigation and how it will reduce or avoid the potential impact</i>

4.2 Residual impacts

Building on the description required under section 4.1 above, the developer will predict and characterize residual environmental impacts (i.e. the environmental impacts that remain after mitigation has been applied) for all Project components. Thorough characterization of residual impacts is critical for the Review Board to make a final determination on significance at the end of the environmental assessment.

The characteristics of residual environmental impacts are described below. The developer will provide these characteristics for each residual impact.

Mechanism – the project component or activity and pathway of effect that causes the predicted impact.

Geographic range – the area where an environmental effect of a defined magnitude occurs, defined for each impact.

Duration – the duration of the impact; corresponds to the length of time after which the environmental impact can no longer be measured or otherwise perceived (e.g. short-term, midterm, long-term, or in some cases permanent).

Frequency – the frequency of the impact; corresponds to how often the impact occurs (e.g. once, at regular intervals, or continuous).

Magnitude – the amount of change in a measurable parameter or variable relative to existing (baseline) conditions, categorized for each VC as low, medium, high, or other qualifier as deemed appropriate.

Reversibility – the likelihood that a measurable parameter will recover from an environmental impact, including through active management techniques (e.g. habitat restoration).

Uncertainty – the uncertainty in impact predictions, based on scientific information and statistical analysis, identified technical boundaries, professional judgement and known effectiveness of mitigation.

Likelihood – the likelihood of that environmental impact occurring is determined.

Overall Implication – a qualitative description of the overall impact on the valued component taking into consideration all residual impacts characterized above.

The developer will use this methodology to respond to the detailed adequacy items in section 4.3. In addition to a thorough description in the text, the results should be summarized in a table (see example Table 4-2 below).

Table 4-2 Example: Summary of residual impacts for (Name of VC)

Description of Residual Impact (after Mitigation)	Evaluation of Residual Impact									
	Mechanism	Geographic Range	Duration	Frequency	Magnitude	Reversibility	Uncertainty	Likelihood	Implication	Cumulative Impacts
(e.g. loss of habitat)	Q	S	ST	O	L	I	L	L	Q	Y
KEY Mechanism Q see Qualitative description in text Geographic Range S Site-specific: (define). L Local: (define). R Regional: (define).		Duration ST Short-term: (define). MT Medium-term: (define). LT Long-term: (define). P Permanent: (define). Frequency O Occurs once. S Occurs at irregular intervals. R Occurs at regular intervals. C Continuous.			Magnitude L Low: (define). M Medium: (define). H High: (define). Reversibility R Reversible. I Irreversible. Uncertainty L Low level of uncertainty. M Moderate level of uncertainty. H High level of uncertainty.			Likelihood L Low probability of occurrence. M Medium probability of occurrence. H High probability of occurrence. Implication Q see Qualitative description in text Cumulative Impacts? Y Potential for environmental impact to interact with the environmental impacts of other past, present or foreseeable future projects or activities. N Environmental impact will not or is not likely to interact with the environmental impacts of other future projects or activities.		

4.3 Cumulative impacts

In order to fully assess potential cumulative impacts, the developer will conduct a cumulative effects assessment for any valued component listed in Table 1 of the *Terms of Reference* (section 2.2.2):

- a) that is susceptible to cumulative effects: and
- b) for which project-related residual impacts are predicted.

The Review Board is satisfied with the developer's approach to determining which past, present or reasonably foreseeable future developments and human activities to consider in the cumulative effects assessment (PR#7, PDR Section 9). The Review Board also acknowledges the proposed mitigation measures provided in the PDR ([PR#7](#)).

To complete the cumulative effects assessment for each relevant valued component, the developer will:

- Combine the Project-related residual impacts predicted (see section 4.2 of this document) with the impacts from the developments, human activities, climate and fire scenarios identified in the PDR:
 - o identify and discuss the way in which a cumulative impact may occur;
 - o predict the potential direct and indirect cumulative impacts according to the same methodology applied for assessing project-specific impacts;
 - o describe techniques and assumptions utilized in impact prediction (e.g. models); and
 - o discuss the contribution of the project to the overall cumulative impact.
- Characterize the cumulative impact according to steps 4 to 6 in section 4.1 of the *Terms of Reference*.

5 ADEQUACY ITEMS FOR ASSESSING SPECIFIC VALUED COMPONENTS

The valued components to be assessed in this EA are set out in the scope of assessment and are listed in Table 1 of section 2.2.2 of the *Terms of Reference*. The adequacy items below identify where additional information is needed to assess potential impacts on valued components. The specific type of additional information needed for each valued component (or topic within a valued component) is summarized in Tables 5-1 to 5-6, below¹. The tables also reference the relevant methodology to be used by the developer to provide the additional information.

Information held by the Community Government of Whatı and the Tłıchǵ Government

The Review Board acknowledges the primary authority of the Community Government of Whatı (CGW) and the Tłıchǵ Government (TG) in overseeing the management of socio-economic impacts on Whatı and Tłıchǵ residents. Both levels of Government have provided documented support for the Project and assisted the developer with baseline data collection and analysis². This includes an analysis of likely indirect impacts to Tłıchǵ citizens and some mitigation measures to manage the effects of certain impacts. The Review Board has identified some information gaps associated with the identified indirect impacts and mitigation measures; these gaps correspond to information that is necessary to understand the potential for significant adverse impacts to socio-economic valued components.

The Review Board is directing information requests (IR) to the Tłıchǵ Government and Community Government of Whatı with the intent that their responses can be submitted to the Review Board's Public Registry in time for the GNWT-DOT to consider before submitting its ASR. Any identified potential impacts to Tłıchǵ citizens, and specifically residents of Whatı, will assist the GNWT-DOT in selecting appropriate mitigation measures to reduce the likelihood of significant adverse impacts.

Information held by Aboriginal groups with an expressed interest in the Project Area

The Tłıchǵ Government, Yellowknives Dene First Nation, North Slave Métis Alliance (NSMA), and Deh Gáh Got'ie First Nation have all expressed interests and Aboriginal Rights in the project area. Some of the potential Project impacts identified during the scoping phase of the environmental assessment relate to harvested species and an alteration of the land for traditional users. The Review Board is seeking information from aboriginal groups that have expressed interest in the Project area to help describe and evaluate the potential adverse impact to Aboriginal well-being and way of life that might occur as a result of the Project, as per its mandate under paragraph 115(1)(c) and section 115.1 of the *Mackenzie Valley Resource Management Act* (MVRMA). The Department of Fisheries and Oceans Canada (DFO) was included in one of the information requests given their mandate for aboriginal fisheries.

¹ If any new impacts are identified during this process, the developer must assess the impacts using assessment methodology steps 4 to 7 from section 4 of the *Terms of Reference*.

² E.g. [PR#7](#) – PDR Appendices [A](#), [B](#), [D](#), [E](#), and [Q](#); Traditional Knowledge Study Report ([PR#28](#))

The Review Board is asking information requests from these groups with the intent that their responses can be submitted to the Review Board’s Public Registry in time for consideration by the GNWT-DOT. Any identified potential impacts to harvesters or land users will assist the GNWT-DOT in selecting appropriate mitigation measures to reduce the likelihood of a significant adverse effect.

5.1 Valued Component: Fish and fish habitat

Scoping sessions identified that fish and fish habitat are of high priority and have cultural and economic value. The community scoping session in Whatı revealed concerns regarding effects from changes in access, pollution and harvesting pressures on fish, fish habitat and fish harvesting ([PR# 19](#) p6). Comments by the Department of Fisheries and Oceans raised concerns regarding the potential for adverse impacts to fish and fish habitat ([PR#24](#), Fisheries and Oceans Canada, ID#1 and 2).

Topic: Fish Habitat

The developer’s PDR lists potential fish species living within the scope of development. The PDR also includes a habitat assessment of streams affected by the scope of development. Potential environmental impacts were considered and mitigations proposed. Specific concerns related to impacts to water quality and fish habitat from construction and operational effects from water crossings, accidents and spills, have not been addressed. The Review Board requires more information to characterize the impacts of the Project on fish habitat or its proposed mitigation measures than what is currently available on the public record.

Table 5-1 outlines the additional assessment required for this topic.

Topic: Fish Harvesting

The Review Board requires more information regarding how the Project may impact existing fish populations and the harvesters that rely on them. The *Traditional Knowledge Study Report* ([PR# 28](#)) provides information on traditional fish harvesting locations within the Project area, particularly along the river Tsoıdeë (Lac La Martre River). However, more information is required on the potential impacts to fish harvesting in relation to both fish-bearing watercourses along the TASR corridor, as well as Lac La Martre and any areas along the TASR corridor that could be used for fish harvesting.

Table 5-1 outlines the additional assessment required for this topic.

Table 5-1. Additional information requirements to assess potential impacts to fish and fish habitat.

Topic	Adequacy item	Relevant Methodology	Additional requirement
Fish Habitat	Water quality	Adequacy 4.1	Describe the potential impacts and mitigation measures to water quality related to fish and fish habitat from the use of explosives.
		Adequacy 4.2	Conduct a residual impact assessment to address potential project effects to water

			quality related to fish and fish habitat from the use of explosives.
		Adequacy 4.1	Describe the potential impacts and mitigation measures to fish habitat and water quality resulting from accidents or spills during construction and operation phases.
	Accidents and spills		Conduct a residual impact assessment to address potential project effects to fish habitat and water quality resulting from accidents or spills. Where appropriate, distinguish between construction and operation phases of the Project.
		Adequacy 4.2	
	Physical Impacts	Adequacy 4.1	Expand on the impact information listed on page 8-28 of the PDR, as per the requirements of assessment step.4.1 (Appendix A), providing all information requested in Table 4-1 of the Adequacy Statement. Indicate the species, critical life stages, and habitat these effects may apply to.
		Adequacy 4.2	Confirm whether or not the list of anticipated residual impacts on page 6 of Appendix T of the PDR is also the comprehensive list of residual impacts from all potential effects listed from pages 8-28 to 8-30 of the PDR. Conduct a residual impact assessment to address any potential project effects to fish habitat.
Fish Harvesting		Adequacy 4.2	Conduct a residual impact assessment to address potential project effects to fish harvesting resulting from accidents or spills. Where appropriate, distinguish between construction and operation phases of the Project. Consider responses from Review Board IR#1.
		Adequacy 4.2	Conduct a residual impact assessment to address project effects on fish harvesting due to increased access and pressure from road users. Include an estimate of the likely number of additional users by category (accounting for seasonal variation): • Aboriginal, non-Tłıchǵ harvesters • NWT resident fishers • Non-NWT fishers
	Important fishing areas	Adequacy 4.1	Describe the potential impacts and mitigation measures from increased access to the areas identified in the <i>Traditional Knowledge Study Report</i> (PR#28) and from responses to Review Board IR#1

Adequacy 4.2

Conduct a residual impact assessment on the ability of the areas identified in the *Traditional Knowledge Study Report* (PR#28) to sustain increased use and fishery pressure.

5.2 Valued Component: Caribou

The GNWT-DOT has provided extensive information regarding caribou and potential impacts from the project (e.g. [PR#7](#) pp6-24 to 6-27; pp8-17 to 8-19). Some additional information is required to assess the potential project-related impacts to caribou and to gauge the effectiveness of proposed mitigation measures.

Topic: Barren-ground caribou

Baseline range information (including seasonal variation) for barren-ground caribou, Bathurst and Bluenose east herds, was not discussed in relation to project impacts during construction and operations phases. According to the *Tłıchǫ Traditional Knowledge Study Report* (PR#28 p35-36), GNWT-ENR telemetry data and traditional knowledge information from the Yellowknives Dene First Nation³, the project is within the winter range of barren-ground caribou. The project will extend the winter road season north of Whatì by one month each year (2 weeks each at the beginning and end of the season). The potential impact on barren-ground caribou populations from extending access to the herds by harvesters by one month each year must be discussed.

A project specific assessment of impacts from direct mortality to barren-ground caribou as a result of increased harvest pressure from the TASR is required as directed in Table 5-2. The Wek'èezhì Renewable Resources Board (WRRB) has co-management responsibilities for caribou and has prepared management strategies. Where management strategies prepared by the WRRB provide recommendations on harvesting, or impacts and mitigations from developments such as all season roads, these recommendations may form part of the response to Table 5-2.

Table 5-2 outlines the additional assessment required for this topic.

Topic: Boreal caribou

The caribou information provided in the PDR is relevant for assessing impacts to boreal caribou that may be present in the vicinity of the project; however, potential impacts to boreal caribou resulting from changes to harvesting pressure, changes to habitat and changes to population trends were not assessed. These information gaps must be addressed in order to assess the potential impacts of the Project on boreal caribou.

Additional information is required to characterize proposed mitigation measures applicable to barren-ground and boreal caribou. In the PDR, the developer proposed a number of mitigations that would address potential impacts to wildlife (e.g. [PR#7](#) p5-2, p8-15, pp8-22 to 8-25). The effectiveness of some of these mitigation measures was challenged during the preliminary screening process (see [PR#24](#) NSMA#1- Attachment p8) and was a supporting rationale in the Review Board's *Reasons for Decision for Environmental Assessment* document to refer the TASR to EA ([PR#2](#) p1). A discussion of how effective these mitigation measures are likely to be in reducing

³ Refer to [traditional knowledge on barren-ground caribou from Yellowknives Dene](#) on Online Review System

or eliminating potential impacts to caribou has not been presented. Neither has a description been provided of any residual effects following implementation of the mitigation measures. Both steps are required to assess potential impacts of the project to caribou.

Table 5-2 outlines the additional assessment required for this topic.

Table 5-2. Additional information requirements to assess potential impacts to caribou.

Topic	Adequacy item	Assessment step(s)	Additional requirement
Barren-ground caribou	Mortality	Adequacy 4.1	Describe the potential impacts and mitigation measures related to barren-ground caribou as a result of increased harvesting pressure along the roads north of Whatì. Include consideration of the longer winter road season and a potential for increased road users.
		Adequacy 4.2	Conduct a residual impact assessment for barren-ground caribou from increased harvesting pressure related to the longer winter road season, including consideration of: • potential impacts and mitigations that may affect population recovery; and • overall effects on abundance, distribution and population trends of barren-ground caribou.
Boreal caribou	Mortality risk	Adequacy 4.1	Describe potential impacts and mitigation measures related to boreal caribou as a result of construction and operation, including: • change in harvesting pressure from a change in access into region; • change in harvesting pressure north of Whatì due to extended season winter road; • vehicle collisions; and • changes in predator-prey relationships.
		Adequacy 4.2	Conduct a residual impact assessment on boreal caribou from project-related activities, including the above identified effects.
	Habitat	ToR 4.1 step 1	Discuss the baseline range for boreal caribou in relation to the project and its effects, including: • seasonal variation; and • location of critical habitat along the road corridor.
		Adequacy 4.1	Describe potential impacts and mitigations from direct and indirect alteration of boreal caribou habitat, inclusive of disturbance, displacement, and barrier effects. Include potential impacts: • from the road disturbance footprint; • from visual, smell, noise, light, and other sensory disturbances (including potential habitat avoidance or loss of effective habitat);

		• on critical habitat areas for various life stages and movement corridors; • from dusting to boreal caribou and habitat; • to loss of functional habitat due to competition with other wildlife species (in particular bison); • to movement patterns, including any changes in interactions with other caribou herds; and • to habitat availability and distribution, due to any increases in fires resulting from use of the road.
	Adequacy 4.2	Conduct a residual impact assessment on boreal caribou habitat from project-related activities, including the above identified impacts.
Population health	ToR 4.1 step 1	Describe the abundance, distribution, and population of boreal caribou populations
	Adequacy 4.1	Describe the potential impacts and mitigations related to boreal caribou populations and population trends, including: • potential effects on sensitive life stages or sensitive or critical habitat; • potential effects on habitat use by boreal caribou; • potential changes to the ability of boreal caribou habitat or populations to recover; and • overall effects on abundance, distribution, and population trends of boreal caribou.
	Adequacy 4.2	Conduct a residual impact assessment on boreal caribou population health from project-related activities, including the above identified impacts.

5.3 Valued component: Wildlife, including species at risk

Concern about potential impacts on wildlife and species at risk was raised by several organizations, including Environment and Climate Change Canada ([PR#24](#) ECCC #13-#16), the Wek'èezhì Renewable Resource Board ([PR#24](#) WRRB#1,#3) and the NSMA ([PR#24](#) NSMA#1- Attachment letter pp7-10). Comments from the preliminary screening (e.g. [PR#24](#) TG#49), and during the technical scoping session mentioned particular concern to local wildlife populations in the project area, including moose, as a result of increased access.

The Review Board has specific responsibilities in an environmental assessment for species at risk described in subsection 79(2) of the *Species at Risk Act*. These responsibilities include a description of the monitoring proposed to determine the effectiveness of mitigation measures and a description of how proposed mitigation and monitoring measures are consistent with applicable recovery

strategies, action/management plans, and COSEWIC Status Reports for species at risk.

This section is relevant to mammals, specifically moose, bison and wolverine, as well as species at risk or species with special conservation status including birds, plants, amphibians, fish and insects. Boreal caribou were considered in the preceding section.

The PDR provides information in sections 6.6.3, 6.5.3, and 6.8.3 regarding which wildlife (including birds, amphibians, and insects), vegetation and fish species at risk may occur in the project area. However, additional information is required regarding the habitat ranges of wildlife and species at risk and the likelihood of their presence in the immediate vicinity of the project area.

In their PDR, the developer proposed a number of mitigations that would address project-related effects to wildlife (e.g. [PR#7](#) p5-2, p8-15, pp8-22 to 8-25). As mentioned for caribou, above, the effectiveness of some of these mitigation measures was challenged during the preliminary screening process (see [PR#24](#) NSMA#1- Attachment letter p8) and was a supporting rationale in the Review Board's *Reasons for Decision for Environmental Assessment* to refer the TASR to EA ([PR#2](#) p1). A discussion of how likely these mitigation measures are to reduce or eliminate concerns to wildlife and species at risk has not occurred. Neither has a description of any residual effects following implementation of the mitigation measures occurred. Both steps are required to assess potential impacts of the project to wildlife and other species at risk. Table 5-3 outlines the additional assessment required for this topic.

Table 5-3. Additional information requirements to assess potential impacts to other wildlife and species at risk.

Topic	Adequacy item	Assessment Step(s)	Additional requirement
Moose, bison, wolverine	Competition	Adequacy 4.1	Describe the potential impacts and mitigations related to moose, bison and wolverine from loss of functional habitat due to competition with other species. Include the potential impact of bison moving into the project area on moose.
		Adequacy 4.2	Conduct a residual impact assessment on moose, bison and wolverine from project-related activities, including the above identified impacts.
	Mortality risk	Adequacy 4.1	Describe potential impacts and mitigation measures to reduce impacts to moose, bison and wolverine as a result of project components, including: • changes in harvesting from changes in access into region; • vehicle collisions; and • changes in predator-prey relationships.
		Adequacy 4.2	Conduct a residual impact assessment on moose, bison and wolverine from project-related activities, including the above identified impacts.

Species at risk	Impacts on species at risk including monitoring	Adequacy 4.2	Conduct a residual effects assessment on species at risk from project-related activities. - Assess potential impacts - Identify mitigation - Propose monitor that considers the effectiveness of mitigation and consistency with recovery or management strategies
Species at risk for mammals, birds, fish, plants, amphibians, insects (excluding boreal caribou)	Population health	Adequacy 4.1	Describe the potential impacts to any mammal (including bats), bird, fish, plant, amphibian, and insect species at risk that have the potential to occur in the vicinity of the project
		Adequacy 4.2	Conduct a residual impact assessment on any mammal, bird, fish, plant, amphibian, and insect species at risk from project components.

5.4 Valued component: traditional use, culture, and heritage resources

The developer's PDR and project scoping activities conducted by the Review Board identified a number of concerns and potential impacts to traditional land and resource use in the project area (e.g. [PR#7](#) p5-1 and [PR#19](#) pp5-6). These concerns and impacts focused on hunting and fishing pressure on traditionally used fisheries (e.g. Lac La Martre) and wildlife (including furbearers), general damage to the land and related impacts on heritage resources and culture. Harvesting impacts to valued species are discussed in their respective valued components above; how project-related impacts affect harvesters is a focus topic for this valued component.

Potential impacts to areas used for traditional activities (e.g. hunting), including culturally-significant areas, may relate to direct effects from the Project (e.g. wildlife mortality and barrier effects) as well as to indirect effects from the Project through increased public access to the project area. The potential project-related impacts from overfishing, increased wildlife harvesting and mortality, disturbances to the land and changes in the perception of the land in the project area need further discussion to assess the likelihood of a significant adverse impact on traditional use, culture and heritage resources.

Topic: Traditional use and way of life

Concerns that increased access would result in more time away from the community and less time spent engaged in traditional activities were identified in the PDR (e.g. [PR#7](#) p8-33; [PR# 7-Appendix B](#) p72) and during the Whatì scoping session ([PR#19](#) p6). The impact assessment for potential impacts to traditional use and way of life was not complete. Understanding how an all-season road might influence these issues is important in assessing the potential impact on traditional use and way of life.

Table 5-4 outlines the additional assessment required for this topic.

Topic: Harvesting

Residents of Whatì also identified concerns about increased wildlife harvesting in the project area due to increased public access (PR#7 p8-30). In their PDR, the developer proposed a number of mitigations that would address project-related effects to harvested species (e.g. PR#7 p5-2, p8-15, pp8-22 to 8-25). The effectiveness of some of these mitigation measures was challenged during the preliminary screening process (see [PR#24](#) NSMA#1- Attachment letter p8) and was a supporting rationale in the Review Board's Reasons for Decision document to refer the TASR to EA ([PR#2](#) p1). A discussion of how likely these mitigation measures are to reduce or eliminate concerns on harvesters has not occurred. In order to understand how the project will affect harvesting, a description of potential impacts to harvesters resulting from project-related effects is required, accompanied by a discussion of the proposed mitigation measures and characterization of residual impacts.

Table 5-4 outlines the additional assessment required for this topic.

Topic: Heritage and cultural resources

In their PDR, the developer identified concerns among community members in Whatì about landscape disturbances reducing their connection to a cultural landscape (PR#7 p8-31). In order to address this concern, the GNWT has proposed a number of mitigations. Specifically, the Tłıchǫ Government and/or Community Government of Whatì will erect signage to prevent damage to culturally-significant areas (such as the La Martre Falls), and that road construction (routing) will avoid cultural sites identified in the Traditional Knowledge study (PR#7 p5-2, p7-2, p8-31, and p8-34). However, there are no references to any potential or known important cultural sites from the Yellowknives Dene First Nation and NSMA in the PDR. This was a concern raised during the Preliminary screening and technical scoping session (e.g. [PR#24](#) NSMA#1- Attachment letter p7; [PR#23](#) p8).

In addition, the Review Board acknowledges that archaeological work has been completed (AOA and AIA) for the road corridor, but requires further clarification on assessing the archaeological potential of borrow sources and access to these locations.

Table 5-4 outlines the additional assessment required for this topic.

Table 5-4 Additional information requirements to assess potential impacts to Traditional use and way of life.

Topic	Adequacy item	Assessment Step(s)	Additional requirement
Traditional use and way of life	Traditional use	Adequacy 4.1	Describe any potential impacts and mitigations to traditional use and way of life from project-related activities, including those identified in responses from Review Board IR#2 and from: anticipated disturbances to wildlife and wildlife movement associated with the operation of an all-season road affecting the

		- perception of the land by traditional users; - a change in perception of the land resulting in changes to traditional use or value of the area; and - from increased mobility and time spent away from the community, including youth.
	Adequacy 4.2	Conduct a residual impact assessment on traditional use and way of life affected by project-related activities, including the above-identified impacts.
Harvesting		
	Wildlife harvesting	
	Adequacy 4.1	Describe any potential impacts and mitigations to traditional use and way of life of Whatı residents from increased competition for harvest resources resulting from increased access and use of region by outside harvesters.
	Adequacy 4.2	Conduct a residual impact assessment on harvesting affected by project-related activities, including the above identified impacts.
Heritage and cultural resources		
	Heritage resources	
	ToR 4.1 step 1	Describe important heritage resources for aboriginal groups that may be affected by the project and its related activities, including those identified in responses to Review Board IR#3 .
	Adequacy 4.1	Describe any potential impacts and mitigations to heritage resources for any areas identified as valued heritage resources, including those identified in responses to Review Board IR#3.
	Adequacy 4.2	Conduct a residual impact assessment on heritage resources for any additional identified resources.

5.5 Valued Component: Economic Well-being

Topic: Equity and vulnerability

The developer has provided documents from the Tłıchǵo Government and Community Government of Whatı that describe their support for the Project and initiatives undertaken to prepare for the challenges and opportunities that an all-season road might bring⁴. Some outstanding challenges and issues are identified in these documents related to direct and indirect Project effects on residents of Whatı. Additionally, the community of Whatı has acknowledged a low level of resilience in some dimensions that could be exacerbated by Project effects⁵. These challenges mostly affect vulnerable

⁴ For examples, see:

- the Tłıchǵo Government and Whatı Community Government Commitments ([PR#7 – PDR-Appendix D](#));
- the Community Government of Whatı Disaster Resilience Plan ([PR#29](#));
- the Community Government of Whatı's 2015-2016 Strategic Planning Details ([PR#30](#));
- the Whatı Micro-economic Analysis of the All-season Road ([PR#7 – PDR-Appendix V](#)); and
- the 2016-05-04 Inter-agency Meeting Summary ([PR#31](#)).

⁵ Refer to the Community Government of Whatı Disaster Resilience Plan ([PR#29](#)),

groups in the community⁶. Social and physical infrastructures that can be affected directly from the Project or indirectly through community population changes or increased demand from other economic sectors resulting from an all-season road. Understanding how an all-season road might influence these issues is important in assessing the potential impact on equity and vulnerability.

Table 5-5 outlines the additional assessment required for this topic.

Topic: Traditional and Non-Wage Economy

Impacts to harvesting and the traditional economy were identified as a public concern in the community and technical scoping sessions (e.g. [PR#19](#) p6; [PR#26](#) pp5-6) as well as in the PDR (e.g. [PR#7](#) p5-1; [PR#7 – PDR-Appendix B](#) p57). It is not evident from the PDR that an assessment of project-related effects on the traditional and non-wage economy has occurred. Understanding how an all-season road might impact the traditional and non-wage economy is important to understand the Project's overall effect to economic well-being.

Table 5-5 outlines the additional assessment required for this topic.

Table 5-5. Additional information requirements to assess potential impacts to economic well-being.

Topic	Adequacy item	Assessment Step(s)	Additional requirement
Equity and vulnerability	Vulnerability	ToR 4.1 step 1	Identify the most vulnerable groups in the community least likely to benefit from the Project or from reasonably foreseeable future economic activities, including those identified in the responses to Review Board information requests.
		Adequacy 4.1	Describe any potential impacts and mitigation measures related to vulnerable groups as a result of anticipated economic benefits associated with the Project, including any corresponding impact on community cohesion, and considering the responses to Review Board information requests.
		Adequacy 4.2	Conduct a residual impact assessment on vulnerable groups affected by project-related activities, including the above identified impacts.
Traditional and Non-wage economy	Non-wage economy	ToR 4.1 step 1	Describe the non-wage economy in Whatì and the degree of local reliance on it to offset cost of living.
		Adequacy 4.1	Describe any potential impacts and mitigation measures related to the non-wage economy from an anticipated increase in harvesting pressure and competition associated with increased access to the region.

⁶ Refer to the Terms of Reference section 2.2.1, footnote #7 for a definition of vulnerability. That definition should be used in the identification of vulnerable groups.

Adequacy 4.2	Conduct a residual impact assessment on aspects of the non-wage economy affected by project-related activities, including the above identified impacts.
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5.6 Valued component: stable and healthy communities

The developer identified public safety, increased illegal substances, changes in the amount of time spent in the community and population increases as issues of concern related to the Project ([PR#7](#) p8-33). Potential impacts to community infrastructure from project-related effects were also identified as a cause for public concern (e.g. [PR#7 – PDR-Appendix B](#) p4-43). The impacts were not characterized for these issues in a manner that allows the Review Board to assess their effect on stable and healthy communities. Understanding how an all-season road might influence these issues is important in assessing the potential impact on stable and healthy communities.

Topic: Use and maintenance of infrastructure

The PDR describes the intent to use the solid waste facilities of Behchoko and Whatì as well as Behchoko's sewage treatment facilities ([PR#7](#) pp4-42 to 4-43). Understanding the anticipated demand that the project and project-related effects will have on community infrastructure is necessary to determine the potential impacts on local populations. While letters of support are provided by the respective communities (see [PDR#7 – PDR-Appendix O](#)), there is no description of the capacity of the community infrastructure to meet project demands. There are additional concerns related to community infrastructure in Whatì (e.g. housing, sewage lagoon, water treatment plant) and the capacity to adjust to future growth scenarios presented by the project (e.g. [PR#7 – PDR-Appendix B](#), pp 28). In order to assess the potential impacts to community infrastructure, the Board requires the developer to describe the potential impacts and mitigations, and characterize any residual impacts following the methodology in section 4, above.

Table 5-6 outlines the additional assessment required for this topic.

Topics: Public Safety and Community Cohesion

The developer has estimated a traffic volume of 20-40 vehicles per day, inclusive of traffic volumes from the foreseeable mining developments north of Whatì ([PR#7](#) p4-3). It is not clear how this number was derived. Understanding the effect of the project on the mobility of Whatì residents is critical to characterizing risks to public safety and related impacts stemming from year round road access. Relevant details on the existing mobility patterns for the community are lacking. This baseline information is important in understanding how frequently an all-season road will be used and assist with impact predictions to public safety. The PDR also lacks a description of emergency services for the operations phase of the road. Understanding how traffic accidents are currently managed on NWT highways and winter roads, and how emergency services are intended to be provided for the operations phase of the all-season road will inform the discussion on public safety.

The Socio-economic Issues Scoping Study (e.g. [PR#7 – PDR – Appendix B](#) pp46-66) discussed various adverse impacts to the community of Whatì during the winter road season. Many of these concerns were also raised by residents of Whatì during the community scoping session (e.g. [PR#19](#) p5). These impacts were not adequately described by the developer, neither was the extent to which the project might influence the ‘winter road’ impacts, nor how the impacts might influence public safety and community cohesion. The developer is required to either provide thorough information as described in section 4, above, or provide clear rationale to explain why a particular impact is not relevant to the all-season road.

Table 5-6 outlines the additional assessment required for this topic.

Topic: Population sustainability

The developer anticipates that an all-season road will serve as a catalyst for population growth and economic development and cites a need for planning community growth in advance to “manage pressure on existing physical and social infrastructure” ([PR#7](#) p8-32). However, there is no elaboration provided in the PDR to characterize the amount or rate of population change anticipated. Understanding how an all-season road might influence changes in population is important in assessing the potential impact to population sustainability in the region.

Table 5-6 outlines the additional assessment required for this topic.

Table 5-6. Additional information requirements to assess potential impacts to stable and healthy communities.

Topic	Adequacy item	Assessment Step(s)	Additional requirement
Use and maintenance of infrastructure	Solid waste & sewage treatment facilities	Adequacy 4.1	Describe any potential impacts and mitigations to community solid waste facilities and sewage treatment facilities used by the Project during construction and maintenance activities, including consideration of: - the anticipated incremental demand on the infrastructure from construction and maintenance (e.g. tonnes of waste or volume of sewage); and - the existing capacity of the infrastructure to accommodate the increased demand.
		Adequacy 4.2	Conduct a residual impact assessment on community solid waste facilities and sewage treatment facilities used by the Project during construction and maintenance activities, including the above identified impacts.
Public safety	Traffic safety	ToR 4.1 step 1	Describe the current levels of mobility for Whatì residents (i.e. movement in and out of), including: as a percentage of the community population;

			• by age and gender; • frequency during winter road season; • frequency outside of winter road season; and • by mode of transport.
		ToR 4.1 step 3a, 3b, 3d	Elaborate on how the vehicle traffic number of 20-40 vehicles per day was derived, including: • proportion of public vs private traffic; • seasonal variations; and • anticipated rate of increase corresponding to anticipated population change and economic opportunities.
		ToR 4.1 step 3d	Provide an estimate on the likelihood, number and severity of motor vehicle accidents affecting Whatì and/or NWT residents on the all-season road using data from other NWT communities with road access as a reference point. Include any statistics from vehicle accidents on the annual winter road to Whatì.
Public Safety	Accidents & Emergency Response	ToR 4.1 step 1	Describe the emergency response services for accidents on NWT public highways, including: • how traffic accidents are currently managed; and • who the responsible authorities are for emergency response and the planning thereof.
		ToR 8	Provide an emergency response plan for how accidents and emergencies will be addressed on the proposed TASR highway, including the responsible authorities for implementation. List any new requirements and expenses for mentioned organizations to implement the plan.
Public Safety and Community Cohesion	Well-being indicators	Adequacy 4.1	Describe potential impacts to public safety and community cohesion from construction camps, including: • pregnancy; • sexually transmitted infections; • drug and alcohol use; and • crime – violent and property.
		Adequacy 4.2	Conduct a residual impact assessment for the above noted indicators and their overall effect on community cohesion.
Population sustainability	Population growth	ToR 4.1 step 3	Describe the anticipated population level change resulting from the operation of an all-season road, including: • estimate the rate of population change from the time the road is constructed and

	projected through to include reasonable foreseeable economic activities; and list the likely source populations for people moving to Whatì. For smaller communities, provide an estimate of the migrants as a percentage of the community of origin (e.g. 10% of Gametì).
Adequacy 4.1	Describe any potential impacts and mitigation measures of the anticipated population change, including those identified in the response to the Review Board's information request to TG and CGW on population growth, and to: - community stability for affected communities; and - community of Whatì infrastructure (i.e. housing, sewage treatment, solid waste facility, law enforcement and health and social services).
Adequacy 4.2	Conduct a residual impact assessment for the anticipated population change and its effect on affected communities (e.g. community stability & infrastructure).

APPENDIX A

TASR Assessment Methodology: EA1617-01 Terms of Reference, section 4

4 ASSESSMENT METHODOLOGY

The purpose of the PDR/ASR is to assess the potential impacts on the environment from the Project.

The major steps in impact assessment are:

- describing the pathways of effect that link the development to valued components of the environment;
- forming and refining impact predictions with the help of consultation and expert knowledge (including traditional knowledge);
- identifying mitigation measures to reduce or avoid adverse impacts; and
- predicting and characterizing residual impacts⁷.

The sections below describe the standard steps to follow in assessing potential impacts to valued components. Any deviation from the listed methodology must be accompanied by detailed rationale regarding the selected methodology in assessing project effects on the environment.

4.1 Impact assessment steps

For each valued component identified in section **Error! Reference source not found.**, the developer will complete an impact assessment, considering scientific and traditional knowledge as applicable, using the following methodology:

1. Identify the natural range of the baseline conditions without the Project, considering variability (including seasonal, inter-annual, and spatial variability for applicable/appropriate parameters) and trends over time.
2. Identify the potential effect pathways, or interactions, between the Project and the valued component.
3. Predict potential direct and indirect impacts⁸:
 - a. describe the techniques used in the impact predictions (e.g. models,);

⁷ Residual impacts are effects that remain after the application of mitigation measures.

⁸ When predicting impacts, the developer must indicate and provide rationale for the chosen temporal and geographic scope used in their assessment (see ToR sections 2.2.3 and 2.2.4).

- b. describe all assumptions and the level of uncertainty associated with each prediction;
 - c. consider likely climate change and fire scenarios and how scenarios affect predicted effects of the Project on valued components; and
 - d. consider and predict how accidents and malfunctions may contribute to predicted impacts. Provide a brief risk assessment for identified accidents or malfunctions on the valued component that includes any residual effects affecting that valued component.
4. Describe the impacts in terms of:
- a. the mechanism that causes the predicted impact;
 - b. geographical extent of the impact and rationale for its selection;
 - c. the duration and frequency of the impact;
 - d. magnitude of the impact (what degree of change is expected);
 - e. reversibility of the impact;
 - f. uncertainty associated with prediction;
 - g. overall implication of the impact on the valued component; and
 - h. likelihood of the impact.

When describing impacts, compare the predicted impacts to pre-development conditions or to conditions without the Project, as appropriate.

5. Identify and describe any proposed mitigation measures:
- a. describe the link between the mitigation measure and the Project component responsible for the impact, and demonstrate **how** the proposed mitigation measures will reduce or avoid the predicted impacts. Include predictions that will help evaluate the effectiveness of the mitigation measures; and
 - b. evaluate the technical and economic feasibility of the mitigation measures, discussing constraints, uncertainties and implementation challenges.
6. Predict the residual impacts by updating the impact predictions in step 3 to include the proposed mitigation measures. Describe any residual impacts according to step 4, and discuss the overall implication of the impacts on the valued component.
7. Describe any monitoring, evaluation and adaptive management plans that will be used to:
- a. detect unexpected changes;
 - b. determine whether impact predictions are accurate;
 - c. evaluate the effectiveness of mitigations; and
 - d. adjust management actions to minimize adverse impacts.

Demonstrate how the plans adhere to adaptive management⁹ best practices, such as those described in guidelines listed in Appendix A¹⁰.

4. 2 Cumulative effects assessment steps

A cumulative effect is an impact (biophysical, socio-economic, or cultural) that results from the proposed development in combination with other past, present or reasonably foreseeable future developments. In the PDR/ASR, the developer will conduct a cumulative effects assessment¹¹ for any valued component that is susceptible to cumulative effects.

In conducting a cumulative effects assessment for each applicable valued component, the developer will use the steps below:

1. Describe and provide rationale for which past, present or reasonably foreseeable future developments, human activities, climate and fire scenarios are being considered in the cumulative effects assessment.
2. Combine the Project-related residual impact predicted under step 6 in section 4.1 with the impacts from the developments and human activities identified above:
 - a. identify and discuss the way in which a cumulative impact may occur;
 - b. predict the potential direct and indirect cumulative impacts;
 - c. describe techniques utilized in impact prediction (e.g. models, assumptions and the level of uncertainty; and
 - d. discuss the contribution of the Project to the overall cumulative impact.
3. Characterize the cumulative impact according to steps 4 – 6 in section **Error! Reference source not found.**

Consideration should also be given to identifying ways in which the developer, either on its own or cooperatively with others, can reduce or avoid any predicted cumulative impacts. Current efforts on cumulative effects assessment and management should be described, including (if applicable) the developer's efforts to coordinate its monitoring and management to contribute towards a regional approach. Lessons learned from previous or current relevant cumulative effects initiatives should be discussed.

⁹ Adaptive management is a decision process that uses the results of monitoring programs to systematically adjust management actions in order to minimize adverse impacts on the environment. For adaptive management to be effective, it needs:

- 1) an overall framework of action levels or thresholds (which identify when to act); and
- 2) proposed mitigation options, policies, and practices linked to the action levels (which describe what actions to take).

¹⁰ In particular:

- [WLWB Draft Response Framework for Aquatic Effects Monitoring](#); and
- [U.S. Department of the Interior Technical Guide to Adaptive Management](#) (particularly the Problem-Scoping Key on page iv).

¹¹ Please see [Appendix H of the Review Board's EIA Guidelines](#) for additional requirements of the cumulative effects assessment.