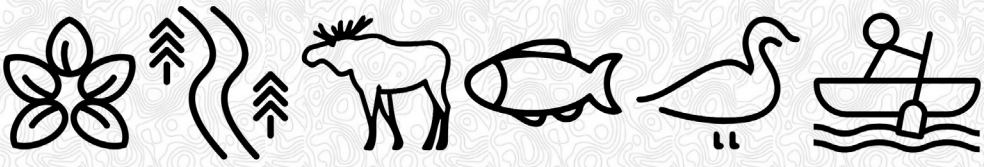
MARTEN FALLS FIRST NATION
**ALL SEASON COMMUNITY ACCESS ROAD**

FINAL

# Acoustic and Vibration Environment Study Plan

***May 2021***



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## Revision History

| Rev # | Date | Revision Description |
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| Draft | May 2020 | Submitted “Study Plan – Acoustic Environment DRAFT FOR DISCUSSION” to the Agency |
| Final | May 2021 | Revised to address federal and provincial agency comments |

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## Appendices

Appendix A. Preliminary List of Data Sources
Appendix B. Agency Comments on the Draft Study Plan

## Acronyms

Agency, the ... Impact Assessment Agency of Canada
CAR ..... Community Access Road
dB ..... Decibel
dBA ..... A-weighted decibel
EA ..... Environmental Assessment
%HA ..... Percent highly annoyed
IA ..... Impact Assessment
IAA ..... *Impact Assessment Act*
IS ..... Impact Statement
ISO ..... International Organization for Standardization
km ..... kilometre
Ldn ..... Day-night sound level

$L_{eq}$ ..... Continuous equivalent sound level
Lmax ..... Maximum sound level
Ln ..... Night-time sound level
LSA ..... Local Study Area
MECP ..... Ontario Ministry of the Environment, Conservation and Parks
MFFN ..... Marten Falls First Nation
MNL ..... Suggested mitigation noise level
MTO ..... Ontario Ministry of Transportation
NPC ..... Noise Pollution Control
PDA ..... Project Development Area
POR ..... Point(s) of Reception
PPV ..... Peak Particle Velocity
PSA ..... Project Study Area
RMSV ..... Root-mean Square Velocity
RSA ..... Regional Study Area
SAR ..... Species at Risk
TISG ..... Tailored Impact Statement Guidelines
TNM ..... Traffic Noise Model
ToR ..... Terms of Reference
USFHWA ..... United States Federal Highway Administration
FTA ..... United States Federal Transit Administration
VdB ..... Vibration velocity level using a decibel scale
VC ..... Valued Component

# 1. Introduction

The Proponent of the Community Access Road (CAR or the Project) is Marten Falls First Nation (MFFN), a remote First Nation community in northern Ontario located at the junction of the Albany and Ogoki rivers, approximately 430 kilometres (km) from Thunder Bay, Ontario. The MFFN community is proposing an all-season Community Access Road that will connect the MFFN community to Ontario's provincial highway network (Highway 643) to the south via the existing Painter Lake Road. MFFN, as the Proponent of the Project, has formed a MFFN CAR Project Team that includes MFFN CAR Community Member Advisors and MFFN CAR Project Consultants who act with input, guidance and direction from the MFFN Chief and Council.

This document outlines the study plan for the Acoustic and Vibration Environment to support a coordinated Impact Assessment (IA) required for Project review by the Impact Assessment Agency of Canada (the Agency) under the federal *Impact Assessment Act* (IAA) and Environmental Assessment (EA) required for Project review by the Ontario Ministry of the Environment, Conservation and Parks (MECP) under the Ontario *Environmental Assessment Act*.

## 1.1 Federal and Provincial Terminology

The study plans have been prepared using federal terminology, however, the respective provincial terminology has been provided in **Table 1-1** for reference. The terms can be used interchangeably.

**Table 1-1: Equivalent Federal and Provincial Terms**

| Provincial Term | Federal Term |
|---|---|
| Criteria | Valued Component |
| Impact Management Measure | Mitigation Measure |
| Net Effects | Residual Effects |
| Record of Consultation | Record of Engagement |

## 1.2 Project Study Plans

This Study Plan is one of a group of study plans created for the Project. **Table 1-2** includes the study plans for each environmental[1] discipline currently planned for the Project and the valued components (VCs) covered by the study plans where applicable.

**Table 1-2: Project Study Plans and Valued Components**

| Environmental Discipline | Study Plan Name | Valued Component(s) |
|---|---|---|
| **Aboriginal and Treaty Rights and Interests** | ■ Aboriginal and Treaty Rights and Interests Study Plan | ■ Indigenous Current Use of Lands and Resources for Traditional Purposes<br>■ Cultural Continuity (ability to practice and transmit cultural traditions) |
| **Atmospheric Environment** | ■ Atmospheric Environment Study Plan | ■ Air Quality<br>■ Greenhouse Gas Emissions |
| **Climate Change** | ■ Climate Adaptation and Resiliency Study Plan | ■ Climate Change |
| **Acoustic and Vibration Environment** | ■ Acoustic and Vibration Environment Study Plan | ■ Noise<br>■ Vibration |
| **Physiography, Geology, Terrain and Soils** | ■ Physiography, Terrain and Soils Study Plan | ■ Physiography, Terrain and Soils |
| **Surface Water** | ■ Surface Water Study Plan | ■ Surface Water |
| **Groundwater and Geochemistry** | ■ Groundwater and Geochemistry Study Plan | ■ Groundwater |
| **Vegetation** | ■ Vegetation Study Plan | ■ Wetland and Riparian Ecosystems<br>■ Upland Ecosystems<br>■ Designated Areas (Areas of Natural and Scientific Interest, Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations)<br>■ Traditional Use Plants and SAR Plant Populations (including species with special conservation status or rarity in the province) |
| | ■ Peatlands Study Plan | ■ Peatland Ecosystems (bogs and fens) |
| **Wildlife** | ■ Wildlife Study Plan | ■ Bats (including SAR-bats such as: Little Brown Myotis [*Myotis lucifugus*], Northern Myotis [*Myotis septentrionalis*] and Tricolored Bat [*Perimyotis subflavus*]) |

1. *The use of the term environment in this document is inclusive of the components of the environment that are included in the Ontario Environmental Assessment Act definition, which includes a general description of the social, cultural, built and natural environments.*

| Environmental Discipline | Study Plan Name | Valued Component(s) |
|---|---|---|
| | | ■ Fur Bearers (proxy VC[2] American Marten [*Martes americana*], Beaver [*Castor canadensis*] and Wolverine [*Gulo gulo*])<br>■ Amphibians and Reptiles<br>■ Pollinating Insects |
| | ■ Ungulates (Moose and Caribou) Study Plan | ■ Moose (*Alces alces*)<br>■ Caribou, boreal population (*Rangifer tarandus*) |
| | ■ Bird Study Plan | ■ Forest Birds (proxy VC of Red-eyed Vireo [*Vireo olivaceus*] for deciduous forest, Ovenbird [*Seirus aurocapilla*] for mixedwood forest, Dark-eyed Junco [*Junco hyemalis*] for coniferous forest and disturbed forest<br>■ Raptors (proxy VC of Osprey [*Pandion haliaetus*] for diurnal raptors and Boreal Owl [*Aegolius funereus*] for nocturnal raptors<br>■ Shorebirds (proxy VC of Wilson's Snipe [*Gallingo delicata*])<br>■ Waterfowl (proxy VC of Mallard [*Anas platyrhynchos*])<br>■ Bog / Fen Birds and Other Wetland Birds (proxy VC of Palm Warbler [*Setophaga palmarum*] for bogs, Common Yellowthroat [*Geothlypis trichas*] for fens; and Northern Waterthrush [*Parkesia noveboracensis*] for swamps .<br>■ SAR birds: Canada Warbler (*Cardellina canadensis*), Chimney Swift (*Chaetura pelagica*), Common Nighthawk (*Chordeiles minor*), Eastern Whip-poor-will (*Antrostomus vociferous*), Eastern Wood-Pewee (*Contopus virens*), Evening Grosbeak (*Coccothraustes vespertinus*), Olive-sided Flycatcher (*Contopus cooperi*), Bald Eagle (*Haliaeetus leucocephalus)*, Peregrine Falcon (*Falco peregrinus*), Short-eared Owl (*Asio flammeus)*, Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Black Tern (*Childonias niger*), Rusty Blackbird (*Euphagus carolinus*), Yellow Rail (*Coturnicops noveboracensis*) |
| **Fish and Fish Habitat** | ■ Fish and Fish Habitat Study Plan | ■ Lake Sturgeon (*Acipenser fulvescens*)<br>■ Walleye (*Sander vitreus*)<br>■ Brook Trout (*Salvelinus fontinalis*)<br>■ Northern Pike (*Esox lucius*)<br>■ Lake Whitefish (*Coregonus clupeaformis*)<br>■ Chain Pickerel (*Esox niger*)<br>■ Yellow Perch (*Perca flavescens*)<br>■ Cisco (*Coregonus artedii*) |

[2] *A proxy VC is used when looking at the effects of one species that represents many others.*

| Environmental Discipline | Study Plan Name | Valued Component(s) |
|---|---|---|
| | | ■ Burbot (*Lota lota*)<br>■ Longnose Sucker (*Catostomus catostomus*)<br>■ White Sucker (*Catostomus commersonii*)<br>■ Forage / Prey Species (including species such as Lake Chub [*Couesius plumbeus*])<br>■ Lower Trophic Organisms (e.g., benthic invertebrates) |
| **Social** | ■ Social Study Plan | ■ Housing and Accommodation<br>■ Community Service and Infrastructure<br>■ Transportation<br>■ Community Well-being<br>■ Populations and Demographics |
| **Economy** | ■ Economic Study Plan | ■ Regional Economy<br>■ Labour Force and Employment<br>■ Government Finances |
| **Land and Resource Use** | ■ Land and Resource Use Study Plan | ■ Land Use Compatibility<br>■ Parks and Protected Areas<br>■ Extractive Industry<br>■ Forestry Industry<br>■ Energy and Linear Infrastructure<br>■ Recreation and Tourism |
| **Human Health and Community Safety** | ■ Human Health and Community Safety Study Plan | ■ Public Safety<br>■ Public Health<br>■ Diet<br>■ Environmental Factors Influencing Health |
| **Visual Aesthetics** | ■ Visual Aesthetics Study Plan | ■ Visual Contrast / Character<br>■ Visibility<br>■ Visual Sensitivity |
| **Archaeological and Cultural Heritage** | ■ Cultural Heritage Study Plan | ■ Archaeological Sites and Resources<br>■ Built Heritage Resources and Cultural Heritage Landscapes |

It should be noted that while there is not a consultation study plan, the Project has developed the *Consultation and Engagement Plan to Support the Environmental Assessment / Impact Statement* (AECOM 2020) (referred to as the Impact Statement [IS] / EA Consultation Plan).

# 2. Purpose and Objectives

The key objectives of conducting an IA / EA are to describe the existing environment, gather sufficient information to predict Project-related effects (positive and negative, direct and indirect) of the Project and alternatives on the environment, determine measures needed to avoid or minimize adverse Project effects, and enhance beneficial Project effects where feasible, and to undertake consultation and engagement throughout. The purpose of this Study Plan is to explain:

- A baseline[3] study methodology that will result in a comprehensive description of the existing environment potentially impacted by the Project;
- How efficient and transparent data management and analysis will be undertaken;
- Effects assessment scoping inputs specific to the Acoustic and Vibration Environment that will allow for potential effects of the Project on the existing environment to be appropriately assessed in the IS / EA Report; and
- How the Study Plan aligns with federal and provincial requirements and guidance, including the Agency's Tailored Impact Statement Guidelines (TISG), dated February 24, 2020 (the Agency 2020c), for this Project and applicable provincial agency comments on the Draft Terms of Reference (ToR)[4].

As required by the IAA and referenced in TISG Section 7.3, work plans will also be developed for disciplines as required. It is anticipated the work plans will include further details on how to action the study plans; for example they would contain such information as location of sampling sites, scheduling, and sequencing.

For the purposes of establishing appropriate context, the Study Plan begins with background and relevant information on:

- Study Plan related discussions with the Agency, the MECP and applicable agencies to date (**Section 3**);
- The approach to Project consultation and engagement (**Section 4**);
- How Indigenous Knowledge will be collected and used in the IA / EA (**Section 5**); and
- The spatial and temporal boundaries that will be used for the IA / EA (**Section 6**).

3. *Baseline refers to the current conditions of the environment potentially impacted by the Project. Baseline conditions serve as a reference against which changes due the Project are measured.*
4. *If necessary, the Study Plan will be updated to reflect the approved ToR if approval is obtained.*

# 2.1 Approach to Handling Confidential Information

## 2.1.1 Indigenous Knowledge

Permission from the Indigenous community will be sought before including Indigenous Knowledge in the IS / EA Report, regardless of the source of the Indigenous Knowledge. Sensitive and / or confidential information will be specifically collected through the Indigenous Knowledge Program to inform the IS / EA Report, and its use and publication will be governed by Indigenous community-specific Indigenous Knowledge Sharing Agreements. Sensitive and / or confidential information collected through Indigenous Knowledge Sharing Agreements will be protected from public or third-party disclosure and will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information. Instances where Indigenous Knowledge sharing has taken place during consultation activities (e.g., meetings) will be recorded in the Record of Consultation and Engagement, including where Indigenous Knowledge was incorporated into Project decisions and into the IS / EA Report (i.e., specifics will not be included in the Record of Consultation and Engagement given the potential sensitivity and / or confidentiality of the information shared).

# 3. Study Plan Technical Discussions

To facilitate the development of satisfactory study plans and eventually a satisfactory IS / EA Report, MFFN previously submitted draft study plans in an effort to hold technical discussions with the Agency, the MECP and applicable agencies. A summary of technical discussions and correspondence held to date on this Study Plan has been provided in **Table 3-1**.

**Table 3-1: Summary of Study Plan Technical Discussions**

| Attendees / Responsible Party | Correspondence | Discussion Points | Solution |
|---|---|---|---|
| ■ **The Agency** | ■ Comments received following the Agency review of draft Study Plan. | ■ **27-August-2020:** Comments and clarification questions received, including editorial comments, additional information requirements regarding study plan, assessment and desktop analysis. | ■ Additional details and clarification provided within the Study Plan, and responses to these comments are attached in **Appendix B.** |
| ■ **Ministry of Heritage, Sport, Tourism, and Culture Industries (Tourism Policy and Research Branch)** | ■ Comments received following the MECP review of draft Study Plan. | ■ **06-August-2020:** Identification of sensitive receptors within and outside of the RSA. | ■ Additional details and clarification provided within the Study Plan, and responses to these comments are attached in **Appendix B**. |
| ■ **The Agency**<br>■ **Health Canada**<br>■ **Ministry of Energy, Northern Development, and Mines (ENDM)**<br>■ **Fisheries and Oceans Canada (DFO)**<br>■ **MFFN CAR Project Team** | ■ Technical discussion of comments received following agency review of draft Study Plan, teleconference meeting. | ■ **03-November-2020:** Project phases and construction lasting less than one year; and more than one year. | ■ Added additional details to Methods for Predicting Future Conditions in Study Plan. Revised study plan indicators and magnitude definitions. |
| | | ■ **03-November-2020:** Assessment of noise during night-time periods, and the effects of individual events. | ■ Added additional details to Methods for Predicting Future Conditions in Study Plan. Revised study plan indicators and magnitude definitions. |
| | | ■ **03-November-2020:** Suggestion to build construction camps to reduce impact on outdoor activities (e.g., hunting, fishing and trapping). | ■ Added additional details to Mitigation and Enhancement Measures in the Study Plan. |
| | | ■ **03-November-2020:** ISO sound level adjustments. | ■ Added additional details to Methods for Predicting Future Conditions in Study Plan. |
| | | **03-November-2020:** Comparison of ambient and Project effects. | Revised Methods for Predicting Future Conditions in Study Plan. |
| | | **03-November-2020:** Underwater acoustic environment and assessment. | Methods for assessing underwater soundscapes will be considered as part of the Fish and Fish Habitat Study Plan. |

# 4. IS / EA Report Consultation and Engagement Process

## 4.1 Interested Persons and Government Agencies

The Proponent will provide Project notices and advise of opportunities for consultation and engagement with interested persons[5] which includes, at a minimum, members of the public outlined in the *Public Participation Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020) (referred to as the Public Participation Plan). This will include the opportunity to provide input on the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures as applicable. A variety of activities will be offered so that members of the public are informed of the IS / EA Report as it progresses and are aware of the opportunities and means to provide their input. The study plans have recognized public and agency input received on the Project to date. Government agencies and interested persons will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process. The Project's approach to handling confidential and sensitive information is outlined in **Section 2.1**.

## 4.2 Indigenous Communities

The Proponent will provide Project notices and opportunities for consultation and engagement with Indigenous communities identified in **Table 4-1,** which is inclusive of all Indigenous communities identified in the *Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020a) (referred to as the Indigenous Engagement and Partnership Plan).

Indigenous communities will be provided the opportunity to be involved at critical decision-making points throughout the IS / EA Report so that the Proponent can consider and incorporate, where appropriate Indigenous Knowledge and Indigenous land and resource use information into the Project as it pertains to the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures. A variety of activities will be offered so that Indigenous communities are

5. *Interested persons, as defined in the IS / EA Consultation Plan, are individuals and groups (e.g., associations, non-governmental organizations, industry and academia) who could have an interest in the Project, including but not limited to communities in the region, those with commercial interests (e.g., forestry, trappers, outfitters, other mineral tenure holders in the area) and recreational users or those with recreational interest (e.g., campers, hunters and environmental groups).*

informed of the IS / EA Report as it progresses and are aware of the opportunities, means and timelines to provide their input. The study plans have recognized Indigenous community input received on the Project to date. Indigenous communities will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process.

### Table 4-1: Identified Neighbouring Indigenous Communities, including their Provincial Territorial Organizations and / or Tribal Council Affiliations

| Tribal Council Affiliation | Indigenous Community or Organization |
|---|---|
| **Matawa First Nations Management**<br>*(Nishnawbe Aski Nation)* | ■ **Marten Falls First Nation** (Proponent and potentially affected Indigenous community)<br>■ Aroland First Nation<br>■ Constance Lake First Nation<br>■ Eabametoong First Nation<br>■ Ginoogaming First Nation<br>■ Neskantaga First Nation<br>■ Nibinamik First Nation<br>■ Webequie First Nation |
| **Matawa First Nations Management and the Union of Ontario Indians / Nishnawbe Aski Nation** | ■ Long Lake #58 First Nation** |
| **Mushkegowuk Council**<br>*(Nishnawbe Aski Nation)* | ■ Attawapiskat First Nation<br>■ Fort Albany First Nation<br>■ Kashechewan First Nation |
| **Shibogama First Nations Council**<br>*(Nishnawbe Aski Nation)* | ■ Kasabonika Lake First Nation<br>■ Kingfisher Lake First Nation<br>■ Wapekeka First Nation<br>■ Wawakapewin First Nation<br>■ Wunnumin Lake First Nation |
| **Independent First Nations Alliance**<br>*(Nishnawbe Aski Nation)* | ■ Kitchenuhmaykoosib Inninuwug First Nation |
| **Independent First Nations**<br>*(Nishnawbe Aski Nation)* | ■ Mishkeegogamang First Nation<br>■ Weenusk First Nation |
| **Nokiiwin Tribal Council** | ■ Animbiigoo Zaagi'igan Anishinaabek First Nation* |
| **Métis Nation of Ontario** | ■ Métis Nation of Ontario; Region 2* |
| **Independent Métis Nation** | ■ Red Sky Independent Métis Nation* |

*Notes: * Indigenous communities or organizations identified by the MECP who should be consulted on the basis that they may be interested in the Community Access Road.*
*** The MECP indicated in a letter to MFFN that Long Lake #58 First Nation was moved from interest-based to rights-based.*

## 4.3 Consideration of Identity and Gender-Based Analysis Plus in Engagement

To fulfill requirements of the IAA, the Consultation and Engagement Program will consider a diverse range of perspectives from interested persons and interested Indigenous communities and their members identified in the Agency's Indigenous Engagement and Partnership Plan and the Public Participation Plan. This will include at a minimum providing ongoing opportunities for engagement to:

- **Neighbouring Indigenous communities, including relevant subpopulations:**
  - Women;
  - Youth; and
  - Elders.
- **Non-Indigenous communities including:**
  - Women;
  - Youth; and
  - Activity-based subgroups (e.g., recreationalists, snowmobilers, tourism establishment operators).

The Proponent will also consult and engage with other subpopulations identified by communities during consultation and engagement. The information from these activities and any additional identity groups identified by communities through consultation and engagement will be considered by applicable environmental disciplines for the purposes of data collection and considering disproportionate effects.

During consultation and engagement, these aforementioned groups will be consulted and engaged with on targeted input**.** Specialized knowledge will be gathered through other disciplines such as Social, Economic, Land and Resource Use and Aboriginal and Treaty Rights and Interests. The Socio-economic Data Collection Program is expected to include targeted interviews, focus groups, questionnaires and other niche tools to gather information from diverse populations to resolve gaps in socio-economic secondary data. These diverse populations include the aforementioned identity groups, which are also referenced in the IS / EA Consultation Plan, and those identified by communities during consultation and engagement. The importance of soliciting inputs and perspectives from diverse subgroups has also been factored into the Indigenous Knowledge Program and associated materials (see **Section 5**).

When feedback is received from interested persons and Indigenous communities, issues, comments and questions will be tracked, which is consistent with the process described in the IS / EA Consultation Plan. Specific to Gender-Based Analysis Plus objectives, this will include efforts to engage with diverse populations. It is expected this will include activities specific to subgroups and tabulation of consultation and engagement participation with respect to identity factors. This will provide summary statistics to demonstrate the diversity achieved in consultation and engagement.

# 5. Consideration of Indigenous Knowledge in the IS / EA Report

The following provides a general description of how Indigenous Knowledge will be considered in the IA / EA process. The extent to which Indigenous Knowledge is considered by each specific VC will vary depending on the nature of the VC, the potential for Project effects on the VC and whether Indigenous Knowledge that relates to a VC is provided / obtained. As such, not all aspects of the general approach described below may apply to all VCs / study plans.

There are two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program. Both programs serve to support the collection of Indigenous perspectives, values, and input on the Project, including Aboriginal and Treaty Rights and how they may be impacted by the Project, to be integrated throughout the IA / EA process. However, the Indigenous Knowledge Program specifically aims to solicit and incorporate information that is considered sensitive and may have confidentiality requirements, including Indigenous Knowledge and information on Indigenous land and resource use. Indigenous Knowledge Sharing Agreements will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information.

All Indigenous communities and groups identified by the MECP and the Agency through the Indigenous Engagement and Partnership Plan have the opportunity to participate in the Indigenous Knowledge Program. The Indigenous Knowledge Program provides interested Indigenous communities an opportunity to: share existing Indigenous Knowledge and information on Indigenous land and resource use and cultural values that may be relevant to the Project, and / or complete Project-specific studies to collect and share Indigenous Knowledge and information on Indigenous land and resource use and cultural values. The Indigenous Knowledge Program includes opportunities for Indigenous communities and groups to meet with the Proponent to discuss the program, ask questions, and share concerns and interests. In support of this, the Proponent has created an Indigenous Knowledge Program Guidance Document (the Guidance Document) that provides:

- An overview of the Indigenous Knowledge Program and information on how Indigenous Knowledge, Indigenous land and resource use and cultural values and practices can be collected and / or shared;

- Information on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values and practices may be used in the planning and design processes; and
- A suite of guidance materials that were developed based on the information requirements of both the federal and provincial assessment processes, including: question guides to support the collection of information on historical and current community context; Indigenous Knowledge that may be relevant to the various technical disciplines; information on Indigenous land and resource use, cultural values and practices and associated spatial data; and perspective on potential Project-related effects and associated mitigation and / or enhancement measures.

The Guidance Document will also support participating Indigenous communities in providing Project-specific information in a manner that facilitates meaningful incorporation into the IS / EA Report.

The IS / EA Consultation Plan outlines the process for obtaining information and feedback about the Project from Indigenous communities (i.e., the Consultation and Engagement Program). All Indigenous communities identified by the MECP and the Agency have the opportunity to participate in the Consultation and Engagement Program through community-specific meetings, Public Information Centres, web conferences, and other formats. All Indigenous communities identified by the MECP and the Agency will be provided information related to the Project and invited to participate at various points throughout the IA / EA process.

There are also opportunities for technical teams to engage with Indigenous communities to solicit perspectives and information relevant to the Project, including information related to collection of existing information and the development of the IS / EA Report. The Proponent also invites feedback and inputs throughout the Project via the Project website and ongoing communications with the Proponent.

The Indigenous Knowledge and Consultation and Engagement programs are designed to be complementary and provide multiple opportunities for communities to offer feedback and information, including perspectives on Aboriginal and Treaty Rights and how these may be impacted by the proposed Project. Relevant information collected through both the Indigenous Knowledge and Consultation and Engagement programs, including potential effect pathways on Aboriginal and Treaty Rights, will be shared with each of the relevant disciplines throughout the IA / EA to: guide and inform VCs; support characterization of the existing environment; identify the potential effects of the Project on VCs; help identify mitigation measures and potential monitoring programs; and ultimately guide Project planning. The nature of how the Indigenous Knowledge becomes integrated into the IS / EA Report will be dictated by the specific information provided by each Indigenous community and the parameters set out in the Indigenous

Knowledge Sharing Agreements. A description of how Indigenous Knowledge was considered in the IA / EA and in each of the technical discipline areas will be included in the IS / EA Report.

It is also important to note that information collected through the various activities (e.g., field studies and programs, effects assessments) of each discipline area (e.g., wildlife, vegetation, cultural heritage) will be shared with the Indigenous Knowledge Program leads. This will support the establishment of the existing environment and the effects assessment for the Aboriginal and Treaty Rights and Interests environmental discipline, as well as the identification of potential mitigation measures and monitoring programs, given the interrelated nature of Indigenous peoples and other environmental disciplines.

The Proponent will strive to respectfully collaborate with Indigenous communities on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values will become part of the IS / EA Report, and how potential effects to Aboriginal and Treaty Rights and interests will be assessed. It is expected that measures to support this may include but are not limited to: engaging Indigenous communities to solicit information on Indigenous Knowledge and Indigenous land and resource use and cultural values to inform baseline conditions, providing Indigenous communities with draft sections of the IS / EA Report to illustrate how Indigenous Knowledge and information on Indigenous land and resource use and cultural values has been integrated and to confirm it has been presented appropriately, and completing collaborative working sessions with Indigenous communities for the effects assessment on Aboriginal and Treaty Rights and Interests. Further information on how potential effects on Indigenous rights will be assessed is provided in the Aboriginal and Treaty Rights and Interests Study Plan.

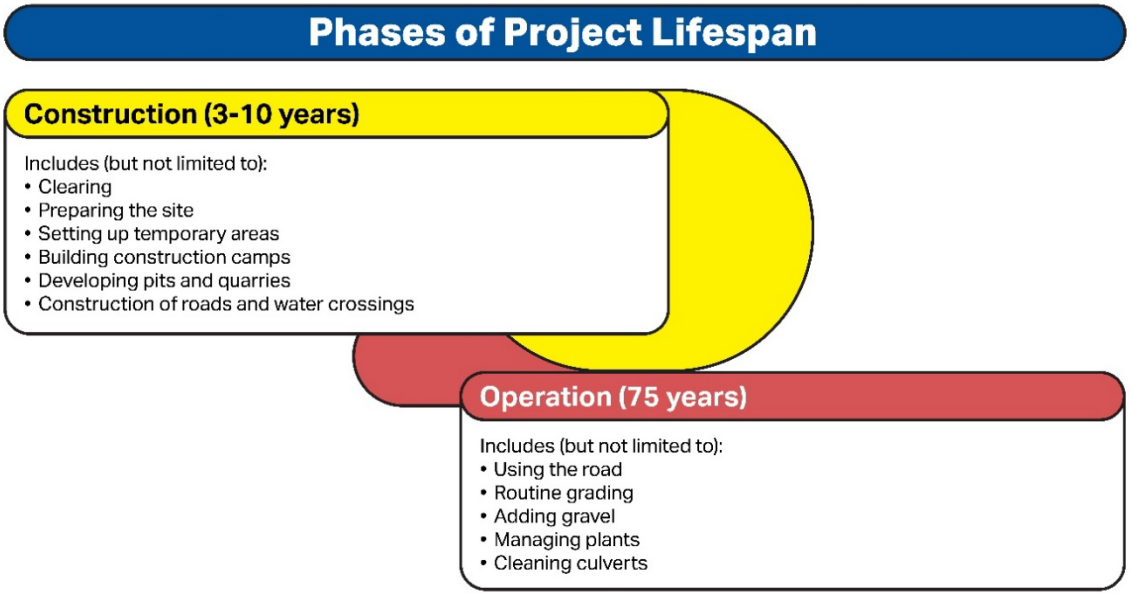
# 6. Assessment Boundaries

## 6.1 Temporal Boundaries: Project Phases

Project phases, which are temporal boundaries, are developed to establish the timeframes within which potential effects of the Project will be considered in the IS / EA Report. The Project is planned to occur in two phases, which are briefly described below and shown in **Figure 6-1.**

- **Construction Phase:**
  The time from start of construction, including site preparation activities, to the start of operations and maintenance of the CAR. Decommissioning of construction works is included in the construction phase. The construction phase for the entire CAR is anticipated to take approximately 3 to 10 years to complete, but the construction activities in any one location are generally expected to be limited to a shorter duration.
- **Operations and Maintenance Phase:**
  The operations and maintenance phase starts once construction activities are complete and lasts for the life of the Project. The operations and maintenance phase of the Project is considered to be 75 years based on the expected timeline for when major refurbishment of road components (e.g., bridges), is anticipated.

**Figure 6-1: Project Schedule**



There are currently no plans to decommission the CAR as there is no expected / known end date for its need. Therefore, future suspension, decommissioning and eventual abandonment of the CAR will not be considered in the IS / EA Report. It will be considered if and when a decommissioning or abandonment application is made for the road.

In determining the temporal boundaries, in particular the long operations and maintenance phase, consideration was given to the long-term effects on the well-being of present and future generations (Sustainability Principle #2[6]). The final temporal boundaries to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation process.

# 6.2 Spatial Boundaries: Study Areas

## 6.2.1 General Information

Study areas identify the geographic extents within which potential effects of the Project are likely to occur and will be considered in the IS / EA Report. The existing conditions and potential effects are documented for three study areas selected for the Project:

- **Project Development Area (PDA):** area of direct disturbance;
- **Local Study Area (LSA):** the area where most of the direct effects of the Project are likely to occur; and
- **Regional Study Area (RSA):** the area where indirect effects of the Project are likely to occur.

The PDA encompasses the 100 metre wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and pits, quarries and associated access roads. The preliminary LSA currently being considered within the scope of the ongoing provincial regulatory review process generally includes the area within 2.5 km on either side of the centreline of Alternative 1 and Alternative 4. The Preliminary study area generally allows for the documentation of existing conditions and prediction of potential environmental effects for the Project. A 5 km wide study area also allows for route refinements during development of Project design (e.g., adjustment of the alignment to avoid sensitive features).

6. *Sustainability Principles #2 is one of four sustainability principles included in Section 25 of the Project's TISG as further elaborated on Section 9.7.*

The specific location of Project components, including the roadway, quarries, pits and temporary infrastructure, are not yet known and will be included in the IS / EA Report. While most of the Project components are expected to be located within the 5 km wide Preliminary LSA, benefits (e.g., reduced environmental disturbance, avoidance of sensitive features, technical considerations, concerns received through consultation) for locating Project components on lands outside of the 5 km wide study area may become known during the IA / EA process. If the need to locate Project components outside the 5 km wide study area is determined to be required or of benefit to the Project, the study area would be adjusted.

The study area for each environmental discipline may vary from the above-described general study area based on the potential for the Project to directly or indirectly affect each environmental discipline; therefore, discipline-specific LSAs and RSAs have been defined for the Project. In defining the final LSAs and RSAs, each environmental discipline will consider:

- Location and other characteristics of the environmental discipline relative to the Project;
- The anticipated extent of the potential Project effects;
- Federal, provincial, regional, and local government administrative boundaries;
- Indigenous groups listed in **Table 4-1;**
- Community knowledge and Indigenous Knowledge;
- Current or traditional land and resource use by Indigenous communities;
- Exercise of Aboriginal and Treaty Rights of Indigenous peoples, including cultural and spiritual practices; and
- Physical, ecological, technical, social, health, economic and cultural considerations.

The study areas included in this document are preliminary, covering the extent to which readily available information suggests the Project may have noticeable effects on the environment. The size, nature and location of past, present and reasonably foreseeable projects will be taken into consideration in the development of the cumulative effects assessment study area(s). The appropriate study area(s) to assess cumulative effects are dependent on the VCs predicted to have direct residual adverse effects as a result of the Project, and therefore, cannot be defined until the IS / EA Report has sufficiently advanced.

As further detailed in **Section 4**, the Proponent will continue to provide opportunities for neighbouring Indigenous communities and interested persons to provide input and inform the effects assessment, including the LSAs and RSAs.

## 6.2.2 Acoustic and Vibration Environment Study Areas

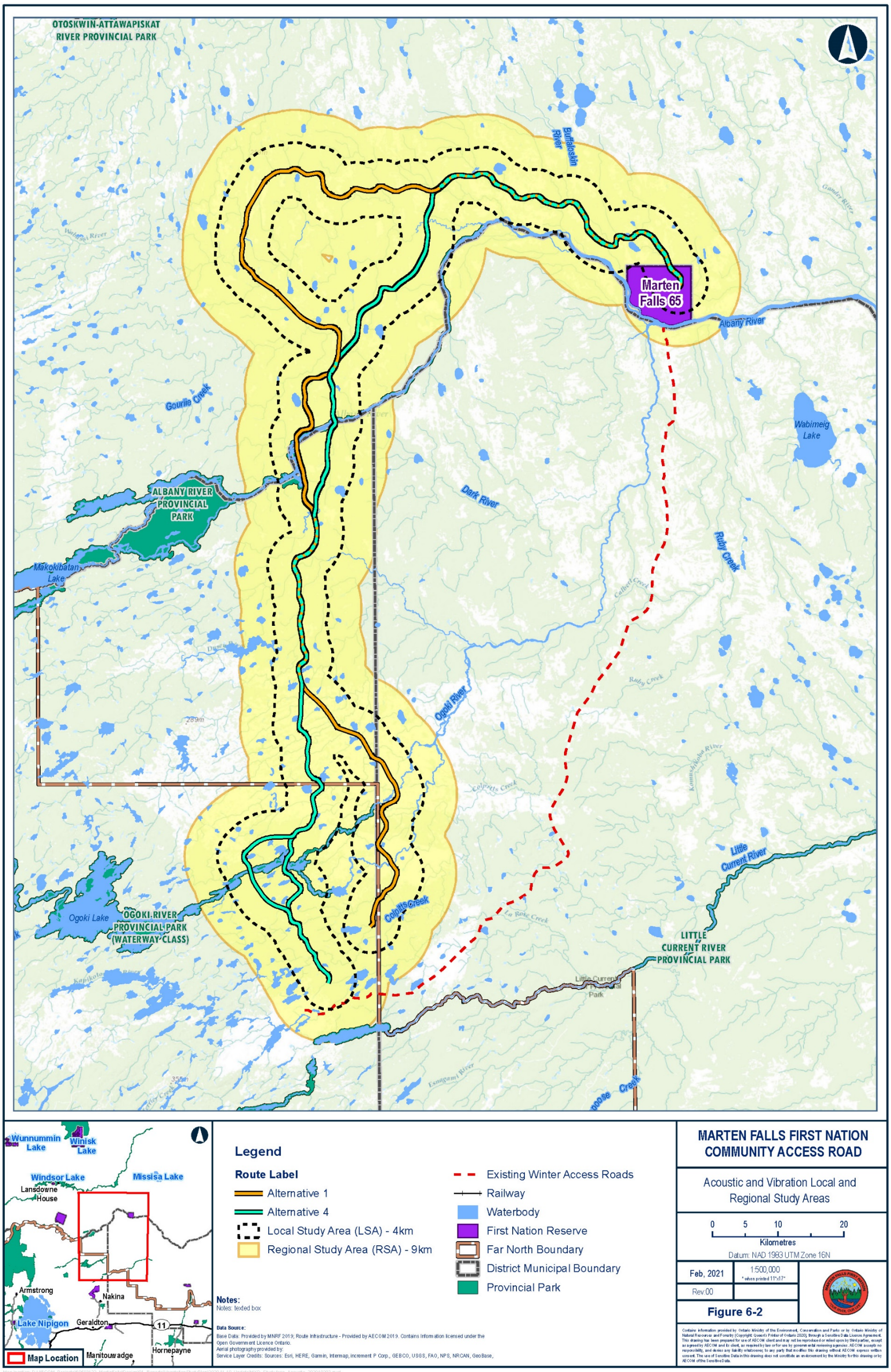
The LSA and RSA boundaries for the Acoustic and Vibration Environment are detailed in **Table 6-1** and shown on **Figure 6-2**.

**Table 6-1: Acoustic and Vibration Environment Study Areas**

| Study Area | Geographic Extent | Rationale |
|---|---|---|
| **Acoustic and Vibration Local Study Area** | ■ PDA plus a 4 km buffer | ■ The setback distance is based on professional judgement and guidance provided by AER Directive 038: Noise Control Directive (Directive 038) (EUB 2007) for noise assessments in Alberta, as no similar guidelines have been established in Ontario. Extending 4 km beyond the PDA will assist in the assessment of possible route refinements.<br>■ Since noise and vibration attenuate with distance, potential noise and vibration effects from the Project are expected to be the highest in the Acoustic and Vibration LSA, and any measurable noise and vibration effects due to the Project are predicted to be generally limited to the Acoustic and Vibration LSA. In the area beyond the Acoustic and Vibration LSA, noise and vibration levels from Project activities are expected to further attenuate, resulting in a lower potential contribution. |
| **Acoustic and Vibration Regional Study Area** | ■ LSA plus a 5 km buffer | ■ The 5 km setback distance (from the LSA) is based on professional judgment and used to address indirect impacts outside the LSA.<br>■ Aligns with field work completed in 2019. |

Noise and vibration may affect nearby wildlife, which may affect outdoor recreational and traditional activities of the community, including activities of Indigenous groups, such as hunting and trapping for recreational and food purposes. The assessment of noise and vibration of the Project on wildlife, socio economics, and human health, as related to sensory disturbance from noise and vibration, is carried out in their respective discipline assessments. However, the federal and provincial noise guidelines do not quantify indirect acoustic and vibration effects, and the direct and quantifiable acoustic and vibration effects are expected to be limited to the Acoustic and Vibration LSA.

## Figure 6-2: Acoustic and Vibration Environment Local and Regional Study Areas



# 7. Baseline Study Design

This section describes the methods used to characterize the existing Acoustic and Vibration Environment of the Project. The Project phases and study areas within which potential effects will be considered and can be reasonably expected to be affected by the Project are those described in **Section 6** above. The characterization of the existing environment serves as the baseline condition for which the environmental effects of the Project will be predicted.

Characterization of the existing environment for noise and vibration within the Acoustic and Vibration LSA was completed by undertaking primarily a desktop review of publicly readily available information, supplemented by field investigations completed specifically for the Project. The approach to characterize the existing environment for noise and vibration in the Acoustic and Vibration LSA is detailed in the following sections and includes:

- identification of information and data sources used in the assessment, including consideration of input from various stakeholders;
- consideration of the spatial boundaries for the assessment of effects identified in **Section 6**;
- identification of potential sensitive receptors in the vicinity of the Project where human activity is expected to occur; and,
- characterize the existing noise and vibration levels through a desktop analysis, supplemented with a field program.

A desktop review of existing information sources will be completed to identify information gaps that will need to be addressed through further study. Information to characterize the existing environment for noise and vibration was collected from a review of information sources as they were made readily available. A preliminary list of applicable information sources has been included in **Appendix A** and reflects federal and provincial guidance received to date. This Study Plan focuses on the additional studies that are anticipated to be required to gather information beyond what is currently available through existing information sources, including those as described in Section 7.2 ‘Sources of baseline information’ in the Agency’s TISG for this Project.

## 7.1 Existing Points of Reception

The review of existing conditions of the Acoustic and Vibration Environment included identifying potential sensitive receptors or Point(s) of Reception (POR(s)) in the vicinity of the Project where human activity is expected to occur in the Acoustic and Vibration LSA.

In October 2019, a preliminary desktop review was carried out to identify potential PORs in the Acoustic and Vibration LSA, including both existing and vacant lands that are expected to be occupied by human activity. A desktop level analysis of the information sources presented in **Appendix A** was carried out. The potential PORs in the Acoustic and Vibration LSA were identified in general accordance with NPC-300[7] guidelines (MECP 2013) and where traditional land uses are expected to be occupied by human activity. NPC-300 defines PORs as sensitive land uses with human activity, including dwellings, campsites or campgrounds, sensitive institutional uses (e.g., educational, nursery, hospital, healthcare, community centre, place of worship, or detention centre), or sensitive commercial uses (e.g., hotel or motel). The traditional land uses include, but are not limited to: cabins, camps, hunting and fishing grounds, travel routes, burial grounds, and archaeological sites.

The review of potential PORs was limited to a preliminary review and therefore a detailed review of existing structures, including the quantity, exact locations and land uses, was not available at the time. Additional information regarding potential PORs within the Acoustic and Vibration LSA will be collected, including through input from the Indigenous Knowledge Program, to develop a more comprehensive list of potential PORs.

## 7.2 Existing Acoustic Environment Noise and Vibration Levels

The characterization of the existing environment for noise and vibration in the Acoustic and Vibration LSA was primarily completed by undertaking a desktop review of the information sources identified in **Appendix A**, followed by referencing information from similar project experiences and using professional judgement. The Health Canada (HC) guide (Health Canada 2017) presents options to estimate existing noise levels, which include using approximate noise levels that depend on the community type and average

[7] *Noise Pollution Control (NPC) Guidelines are set by the MECP to ensure sources of noise emissions to the environment are adequately controlled to prevent potential negative effects (MECP 2013).*

population density, and according to NPC-300, the exclusionary sound level limits may be adopted to describe the expected noise levels at PORs based on a classification system.

The desktop analysis to characterize the existing acoustic environment noise levels was supplemented with a field program. A baseline noise field program was completed in November 2019 to document existing ambient noise levels before the Project components are implemented. The baseline noise measurements / monitoring were completed in general accordance with guidelines provided by the MECP, the methodology outlined in NPC-300, and internationally recognized standards issued by the International Organization for Standardization (ISO). The field program included a long-term monitoring component (Baseline Noise Monitoring) and a short-term measurement component (Baseline Noise Measurements). The Baseline Noise Monitoring was completed through unattended monitoring, and the Baseline Noise Measurements were completed through attended measurements where field staff documented ambient conditions while the noise measurements were being completed.

Through discussions with the MFFN CAR Project Team, representative sensitive receptor locations were selected for both the Baseline Noise Monitoring and Baseline Noise Measurements. The community of MFFN was identified as a location that could be representative of all PORs within the Acoustic and Vibration LSA. A receptor location within the community of MFFN was identified in a more populated area where it was expected ambient levels were influenced by human activities. A second receptor location, in a more natural area of MFFN, was identified to document ambient levels away from human activities. These two receptor locations were expected to provide the potential range in existing ambient noise levels within the Acoustic and Vibration LSA.

**Baseline Noise Monitoring** at the representative sensitive receptor locations was conducted using sound level meters set to record one-minute equivalent noise levels (Leq) and noise levels exceeding 90% of the measurement period (L90). The Baseline Noise Monitoring program was completed over a period of up to approximately 48 hours, when unfavourable weather (i.e., periods of precipitation and wind speeds exceeding 20 km/h) was not expected. Weather data was obtained from the Marten Falls Ogoki Airport weather station. The monitoring was completed through unattended monitoring to document baseline noise levels over various days of the week and over various periods of the day at each location, to quantify variability in monitored noise levels. The collected Baseline Noise Monitoring noise data was reviewed, and if it was determined that some of the data may be abnormal, these data was screened to remove any abnormal noise events (e.g., birds or insects close to microphone) as well as noise data collected under unfavourable weather conditions (i.e., periods of precipitation and wind speeds exceeding 20 km/h). The daytime and night-time ambient noise levels were calculated based on all collected valid noise data. The collected data included noise levels as well audio recordings of discrete noise events to aid in data analysis.

During the noise monitoring, the following community activities were observed at the monitor location representative of the community: house construction / renovation activity, local road traffic and human outdoor activities. The duration of such activities was specific to the time of the day and season (i.e., late autumn).

Short-term attended **Baseline Noise Measurements** were conducted for up to approximately 20 minutes to supplement the Baseline Noise Monitoring data, collecting similar noise metrics. Community noise annoyance, expressed in percentage of highly annoyed (%HA), was determined based on the daytime and the night-time baseline noise levels measured during the field program.

The field program was completed during late autumn with conditions representative of those during wintertime (i.e., presence of snow on the ground, periods of high wind and absence of wildlife and insects). The existing noise levels measured in the more populated area during this time of year would likely represent the lower range of the typical seasonal variability of the ambient noise levels expected to be present in such an area. It is expected that during the summertime, due to increased frequency and duration of human activities, the ambient noise levels may increase in comparison to the ambient noise levels measured during the field program. In the more natural area, a similar trend is expected during the spring and summer seasons due to increased activities of wildlife and insects.

Data for the noise field program includes the following information for each location:

- Sound level meter / monitor make and model;
- Microphone make and model;
- Monitoring/measurement location;
- Mounting method;
- Height of microphone;
- Information on microphone protection (e.g., wind screen);
- Sound level meter / monitor settings;
- Recording mode;
- Meteorological conditions during the monitoring obtained from a community met station (e.g., wind speed and precipitation);
- Summary of any issues with equipment (e.g., failure);
- Summary of field calibrations completed; and,
- Hourly baseline noise levels.

# 8. Data Management and Analysis

Data management including quality assurance / quality control (QA / QC) will be employed to minimize potential for data entry and analysis errors, prepare data sets for analysis and limit sensitive data distribution in accordance to established agreements.

The noise data collected for this Project was reviewed to identify any abnormalities. Abnormal noise events (e.g., birds or insects close to microphone) were removed, as well as noise data collected under unfavourable weather conditions (i.e., periods of precipitation and wind speeds exceeding 20 km/h). The screening was completed using various tools, which included audio recordings (where deemed appropriate) and analysis of the raw noise monitoring data in combination with meteorological data obtained from the Marten Falls Ogoki Airport. The daytime and night-time ambient noise levels were calculated based on all collected valid noise data.

Noise modelling predictions and supporting calculations will be thoroughly reviewed and all technical reviews will be documented. Technical review documentation will be retained along with all other Project files.

# 9. Effects Assessment

The following sections provide discipline-specific input and considerations as they pertain to the methodology for effects assessment. The Project is in the early stage of the IS / EA Report preparation and it is expected that the effects assessment methodology will be refined iteratively based on regulatory agency guidance, professional judgment and input received through the Project consultation and engagement process.

## 9.1 Project-Environment Interactions

The Project activities that may result in changes to the environment are described within the identified temporal and spatial boundaries. This includes identification of both direct and indirect changes by comparing the existing setting to the conditions anticipated to occur as a result of the Project. For each environmental discipline, the likely Project-environment interactions will be identified based on professional judgment, activities listed in TISG Section 3.2 as well as projects of similar magnitude and / or location.

A preliminary analysis of Project-environment interactions for the Acoustic and Vibration Environment is provided in **Table 9-1** and will be confirmed during the IA / EA process to identify the Project-environment interactions that are likely to have a potential effect, and to identify measures to avoid or minimize potential negative effects and enhance benefits.

**Table 9-1: Project – Environment Interactions**

| Project Phases | Project Activities | Noise and Vibration |
|---|---|---|
| **Construction Phase** | *Mobilization of Equipment and Supplies* | X |
| | *Temporary Construction Staging Areas*[1] | X |
| | *Temporary Access Roads and Trails*[1] | X |
| | *Temporary Construction Camps*[1] | X |
| | *ROW Clearing and Grubbing* | X |
| | *Brush and Timber Disposal* | X |
| | *Pits and Quarries*[1] | X |
| | *Drilling / Blasting / Aggregate Production* | X |
| | *Road Construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)* | X |
| | *Bridge and Culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)* | X |
| | *Construction Site Restoration* | X |
| **Construction Phase: Decommissioning** | *Pits and Quarries* | X |
| | *Temporary Camps, Roads / Trails and Staging Areas* | X |
| **Operations Phase** | *Road Usage* | X |
| | *Maintenance*[2] | X |

*Notes: 1. Includes construction and use of*
*2. Includes General Maintenance (e.g., grading, erosion control, quarrying, borrow pits), Seasonal Maintenance (e.g., snow clearing, bridge and culvert maintenance), and Special Maintenance (e.g., slope failures, road settlement / break-up.).*

## 9.2 Valued Components and Indicators

VCs are the environmental, health, social, economic or additional elements or conditions of the natural and human environment that may be impacted by a proposed project and are of concern or value to the public, Indigenous peoples, federal authorities and interested parties (the Agency 2020b). Indicators represent the resource, feature, or issue related to the VC that, if changed, may demonstrate an effect on the environment. The indicators and rationale for selection and measurement of potential effects, to be used to assess and evaluate the alternative routes in the IS / EA Report are provided in **Table 9-2**. The table includes both quantitative and qualitative indicators. The final list of VCs and indicators to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

The VCs of the Acoustic and Vibration Environment have been determined through consideration of the following factors listed in the TISG[8]:

- VC presence in the study area;
- the extent to which the VC is linked to the interests or exercise of Aboriginal and Treaty Rights of Indigenous peoples, and whether an Indigenous group has requested the VC;
- the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the VC;
- the extent to which the VC may be under cumulative stress from other past, existing or future undertakings in combination with other human activities and natural processes;
- the extent to which the VC is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies);
- the possibility that adverse or positive effects on the VC would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and
- whether the potential effects of the Project on the VC can be measured and / or monitored or would be better ascertained through the analysis of a proxy VC.

8. *The TISG also states that information from ongoing and completed regional assessments in the proposed area of the Project should be used to inform VCs for the Project. In February 2020 a regional assessment of the Ring of Fire region commenced; however, it is not sufficiently advanced at this time to inform the Project VCs. The VCs will be consulted and engaged on early in the IA/ EA process and finalized taking into consideration the input received. Therefore, only information relevant to the Project that arises from the regional assessment of the Ring of Fire within an appropriate timeline will inform the VCs for the Project.*

Inputs received to date from Indigenous communities, agencies and interested persons through the Consultation and Engagement Program, including inputs received on the Draft ToR, have also been used to inform the selection of the VCs and indicators for the Acoustic and Vibration Environment.

**Table 9-2: Acoustic and Vibration Environment Indicators**

| Valued Component | Indicators | Rationale for Selection |
|---|---|---|
| **Noise** | ■ Continuous one hour equivalent sound level ($L_{eq,1hr}$)<br>■ Maximum night-time sound level ($L_{max}$)<br>■ Day-night sound level ($L_{dn}$)<br>■ Day-time sound level ($L_d$)<br>■ Night-time sound level ($L_n$)<br>■ Percent highly annoyed (%HA) | ■ Field investigations<br>■ Agency feedback<br>■ Data from previous EAs<br>■ Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning – NPC-300 (MECP 2013)<br>■ Environmental Guide for Noise (MTO 2006)<br>■ A Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways and Environmental Assessments (MTO / MECP 1996)<br>■ Guidance for Evaluating Health Impacts in Environmental Assessment: Noise (Health Canada 2017)<br>■ World Health Organization (WHO) Guidelines for Community Noise (WHO 1999)<br>■ United States Federal Transit Administration (USFTA) Transit Noise and Vibration Impact Assessment Manual (U.S. Department of Transportation 2018)<br>■ OPSS (Ontario Provincial Standard Specification). 2014. OPSS 120 General Specification for the Use of Explosives. November 2014<br>■ MECP Model Municipal Noise Control By-law, Publication NPC 119 (NPC 119). August 1978. |
| **Vibration** | ■ Peak particle vibration velocity (PPV)<br>■ Root-mean square vibration velocity (RMSV) | |

*Note: Indicators related to wildlife, socio economics and human health, as related to sensory disturbance from noise and vibration, are presented in their respective reports.*

# 9.3 Potential Effects

A direct effect occurs through the direct interaction of an activity with an environmental discipline. The Project-environment interactions currently anticipated, based upon preliminary analysis, to result in direct effects to the Acoustic and Vibration Environment have been identified in **Table 9-1**. The potential direct effects resulting from the Project-environment interactions will be confirmed during the IA / EA process and will be based on input received through the Indigenous Knowledge Program and Consultation and Engagement Program, regulatory agency guidance, and professional judgement.

An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental discipline (e.g., changes in vegetation could indirectly affect wildlife). **Table 9-3** provides a preliminary identification of how changes to the Acoustic and Vibration Environment may result in indirect effects to other environmental disciplines.

### Table 9-3: Potential Discipline Interactions

| Discipline and Associated Valued Components | Aboriginal and Treaty Rights and Interests | Atmospheric Environment | Climate Change | Acoustic and Vibration Environment | Physiography, Geology, Terrain and Soils | Surface Water | Groundwater and Geochemistry | Vegetation | Wildlife | Fish and Fish Habitat | Social | Economy | Land and Resource Use | Human Health and Community Safety | Visual Aesthetics | Archaeological and Cultural Heritage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Acoustic and Vibration Environment**<br>■ **Noise**<br>■ **Vibration** | X | - | - | | X | - | - | - | X | X | X | X | X | X | - | X |

*Notes: X = Potential pathway for indirect effect as a result of the Project.*
*- = No pathway for indirect effect is anticipated as a result of the Project.*

# 9.4 Methods for Predicting Future Conditions

With respect to quantitative models and predictions, the IS / EA Report will detail the model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained.

The effects assessment will assess all phases of the Project including the CAR operations, construction activities and sub-phases, and temporary construction-related facilities (e.g., aggregate extraction and refining). The Project effects will be assessed using guidance from federal and provincial guidelines, and guidelines inline with generally accepted practices within the industry. It is understood that Project construction will occur in phases and may expose receptors to activities that vary in duration. This phased approach will be incorporated into the noise and vibration assessments. To provide some context for the change in the acoustic environment due to the Project, noise due to all phases of Project operation and construction may be compared to baseline levels. However, any recommendations for mitigating Project noise and vibration will be based on federal and provincial guideline limits and thresholds. The guidelines, limits and methods for predicting and assessing the Project noise and vibration effects are described below.

## 9.4.1 Federal Noise Guidelines and Limits

The noise effects due to the Project operations and construction activities will be assessed using the Health Canada guide (Health Canada 2017). Although Health Canada does not have enforceable noise thresholds or standards, the HC guide is a guidance document for the assessment of environmental noise. The Health Canada guide provides general information on predicting health risks related to noise in federal EAs of major resources and infrastructure projects. Within the context of the MFFN CAR Project noise and vibration assessment, operations will correspond to operation of the CAR and construction sub-phases and temporary facilities that may last one year or longer. Short-term construction will correspond to construction sub-phases and temporary facilities that may operate for less than one year. The Health Canada guide assesses potential noise impacts due to a project using numerous acoustical descriptors, or indicators. **Table 9-4** summarizes these indicators, the corresponding Health Canada guide criteria, and how these may correlate to impacts on human receptors. The effects assessment will evaluate the noise descriptors described in **Table 9-4** below.

### Table 9-4: Health Canada Guide Noise Assessment Descriptors and Criteria

| Activity | Noise Descriptor(s) | HC Guide Limit[9] | Noise Impact Correlation |
|---|---|---|---|
| **Project Operations / Construction ≥ 1 year** | Outdoor $L_d$ | 55 dBA | ■ Threshold for sustaining good outdoor speech comprehension |
| | Outdoor $L_{dn}$ | 55 dBA | ■ Threshold for "no reaction" response in terms of noise complaints due to intruding noise |
| | %HA | %HA ≤ 6.5% | ■ Threshold for noise-induced human health effects |
| | Outdoor $L_n$ | 40 dBA (annual average) | ■ Threshold for adverse health effects due to sleep disturbance |
| | Outdoor $L_{max}$ | 60 dBA, 10-15 events per night | ■ Threshold for sleep disturbance due to individual night-time noise events |
| **Construction < 1 year** | Outdoor $L_n$ | 45 dBA | ■ Threshold for adverse effects due to sleep disturbance due to night-time construction noise |
| | Outdoor $L_{max}$ | 60 dBA, 10-15 events per night | ■ Threshold for adverse effects due to sleep disturbance due to night-time construction noise |
| | Suggested mitigation noise level (MNL), $L_{dn}$ | 47 dBA (Basic MNL) + project-specific adjustments (i.e., +10 dB if duration is less than two months for a given receptor location) | ■ Suggested threshold to avoid widespread complaints due to construction noise |

In assessing impacts on human health, baseline levels will be added to Project noise levels.

Receiver locations near the Project may also be exposed to noise from other projects or facilities. If residual acoustic effects from the Project are predicted, a cumulative effects assessment will be carried out to assess the combined impact of the Project and other existing physical activities, as well as future physical activities that are certain and reasonably foreseeable. The cumulative effects assessment will consider other existing or future certain and reasonably foreseeable physical activities located within 5 km of Project receptors. The cumulative effects assessment will incorporate publicly available information for the other facilities and operations. Where information for these projects is not publicly available, the effects assessment will assume these projects comply with federal noise limits.

9. *For the purposes of this EA, in the event the baseline study indicates noise levels greater than any of the HC Guide Limits for a specific noise descriptor at a receptor location, a maximum increase of 3 dB will be considered as the limit for that noise descriptor at that receptor location.*

## 9.4.2 Provincial Noise Guidelines and Limits

Traffic noise impact assessments within Ontario are assessed using the Ontario Ministry of Transportation's (MTO) *Environmental Guide for Noise* (the MTO Guide – MTO 2006); and the MTO / MECP joint guideline *A Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways and Environmental Assessments* (the MTO / MECP Protocol – MTO / MECP 1996). Both guidelines assess traffic noise impacts considering the change in traffic noise levels above ambient sound levels but the MTO Guide also includes an overall sound level limit. **Table 9-5** below summarizes the MTO Guide and MTO / MECP Protocol traffic noise level criteria.

**Table 9-5: Provincial Traffic Noise Assessment Descriptors and Criteria**

| Guideline | Noise Descriptor | Guideline Limits |
|---|---|---|
| **MTO Guide** | $L_{eq}$ (16-hour) | ■ 5 dBA or greater change above ambient level, or 65 dBA |
| **MTO / MECP Protocol** | $L_{eq}$ (16-hour) | ■ Greater than 5 dBA change above ambient noise level when noise levels are greater than 55 dBA |

The MTO Guide is typically used to assess provincial freeways and highways. The MTO / MECP Protocol is typically used to assess other classes of roadways, such as arterial roads. Based on this, and the fact that it is unknown at this time who will have jurisdiction of the CAR upon completion of the Project, the MTO / MECP Protocol criteria limits will be used for the traffic noise assessment. Note that these limits relate to a 16-hour $L_{eq}$ noise descriptor, for the period from 07:00 to 23:00.

There are no provincial guidelines that provide construction noise limits at receiver locations. Some long-term construction activities may include temporary facilities with stationary noise sources (e.g., aggregate extraction). The NPC-300 guidelines apply to stationary noise source assessments but do not provide a means of determining when long-term construction activities should be assessed as stationary facilities. For the purposes of the EA, referencing the construction durations provided in the Health Canada guide, construction-related facilities that may operate for one year or longer will be assessed using NPC-300. **Table 9-6** below summarizes the minimum sound level limits provided in NPC-300 for urban, sub-urban and rural areas, expressed in terms of the one-hour equivalent sound level (Leq,1hr) for different periods of the day. Where baseline levels exceed the NPC-300 minimum sound level limits for the same time of day, the baseline levels may be used as the sound level limits.

**Table 9-6: MECP Guideline NPC-300 Sound Level Limits**

| Point of Reception Location | Time of Day | Class 1 (urban) Area (dBA) | Class 2 (sub-urban) Area (dBA) | Class 3 (rural) Area (dBA) |
|---|---|---|---|---|
| **Outdoor** | 07:00 – 19:00 | 50 | 50 | 45 |
| **Outdoor** | 19:00 – 23:00 | 50 | 45 | 40 |
| **Plane of Window** | 07:00 – 19:00 | 50 | 50 | 45 |
| **Plane of Window** | 19:00 – 23:00 | 50 | 50 | 40 |
| **Plane of Window** | 23:00 – 07:00 | 45 | 45 | 40 |

## 9.4.3 Vibration Guidelines and Criteria

Depending on the Project related activities, there are various vibration limits that can be considered. There are no provincial or federal guidelines that provide vibration limits for Project operation or general non-blasting construction activities. The Project vibration levels due to the CAR operations and general non-blasting construction activities will be assessed using a vibration Zone of Influence, as described in City of Toronto By-law 514-2008; and vibration criteria limits for buildings where people sleep, as described in the U.S. Department of Transportation / Federal Transit Administration (USFTA) *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). **Table 9-7** below summarizes the corresponding vibration criteria.

**Table 9-7: Vibration Assessment Descriptors and Criteria – Project Operation and General Non-Blasting Construction Activities**

| Activity | Vibration Descriptor | Criteria Limit | Vibration Impact Correlation |
|---|---|---|---|
| **CAR Operations** | PPV | 5 mm/s | ■ Screening threshold for vibration-related building damage due to CAR operations |
| | RMSV | 0.1 mm/s [10] | ■ Criteria limit for vibration impacts on sleep due to CAR operations |
| **General Non-Blasting Construction** | PPV | 5 mm/s | ■ Screening threshold for vibration-related building damage due to Project construction |
| | RMSV | 0.1 mm/s (3) | ■ Criteria limit for vibration impacts on sleep due to Project construction |

*10. Converted from FTA Manual RMSV limit of 72 VdB, (re: 1 micro-inch/sec).*

If receptor locations are identified within the vibration Zone of Influence, the Project vibration levels due to the CAR operations and general non-blasting construction activities will be assessed using the prohibited construction vibration limits, as described in City of Toronto By-law 514-2008; and vibration criteria limits for buildings where people sleep, as described in the USFTA Manual. **Table 9-8** below summarizes the corresponding vibration criteria.

### Table 9-8: Vibration Assessment Criteria Within Vibration Zone of Influence

| Activity | Vibration Descriptor | Frequency of Vibration (Hz) | Criteria Limit | Vibration Impact Correlation |
|---|---|---|---|---|
| **CAR Operations** | PPV | < 4 | 8 mm/s | ■ Criteria limit for vibration-related building damage due to CAR operations |
| | | 4 to 10 | 15 mm/s | |
| | | >10 | 25 mm/s | |
| | RMSV | - | 0.1 mm/s (11) | ■ Criteria limit for vibration impacts on sleep due to CAR operations |
| **General Non-Blasting Construction** | PPV | < 4 | 8 mm/s | ■ Criteria limit for vibration-related building damage due to Project construction |
| | | 4 to 10 | 15 mm/s | |
| | | >10 | 25 mm/s | |
| | RMSV | - | 0.1 mm/s (4) | ■ Criteria limit for vibration impacts on sleep due to Project construction |

The OPSS 120 2014 covers the requirements for the use of explosives during construction blasting (i.e., along the CAR) and has been developed for use in provincial and municipal oriented contracts. The limits specified in OPSS 120 2014 are designed to mitigate damage from vibrations induced by the use of explosives on construction blasting projects. **Table 9-9** below summarizes the PPV limits specified by OPSS 120 2014.

### Table 9-9: Vibration Assessment OPSS 120 (Use of Explosives During Construction Blasting) Descriptors and Criteria

| Element | Proposed Limit | Peak Particle Velocity (mm/s) |
|---|---|---|
| **Structures and Pipelines** | ≤ 40 Hz | 20 |
| | > 40 Hz | 50 |
| **Concrete and Grout <72 hours from placement** | N/A | 10 |

*Note: < = less than; ≤ = less than or equal to; > = more than; Hz = hertz; mm/s = millimetres per second*

*11. Converted from FTA Manual RMSV limit of 72 VdB, (re: 1 micro-inch/sec).*

Both ground and air vibration effects due to blasting produced at receptors adjacent to quarries are subject to guidelines and limits contained in the MECP's NPC-119 (Ontario Ministry of the Environment 1978). The limits specified in the MECP's NPC-119 are designed to minimize vibration effects due to quarry blasting. Under conditions where monitoring of the blasting operations is routinely carried out, the recommended ground and air vibration limits at the nearest receptors are 12.5 mm/s and 128 dBL respectively.

### 9.4.4 Noise and Vibration Prediction Methods

Road traffic noise due to the Project will be predicted with one of several prediction modelling approaches generally accepted by the MECP:

- The Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) algorithm, developed by the MECP. This algorithm is implemented in the STAMSON modelling software application.
- The Traffic Noise Model (TNM), developed by the United States Federal Highway Administration (USFHWA) as the computerized noise prediction modelling software for use on all U.S. Federal-aid highway projects.
- The Computer Aided Noise Attenuation (CadnaA) noise prediction modelling software, developed by DataKustik GmbH, implementing the RLS-90 road prediction algorithm. STAMSON would be used to verify the CadnaA model's prediction results at a number of receptor locations.

The preferred modelling algorithm will be selected depending on the number of sensitive receptors identified and the complexity of the relevant modelling inputs, such as topography. ORNAMENT is the preferred traffic noise modelling algorithm by the MECP, however it is limited in its ability to consider certain modelling inputs such as complex geography and therefore if such inputs are required, either TNM or CadnaA will be considered. According to the FHWA, TNM replaced the previous computerized noise prediction modelling software STAMINA 2.0 / OPTIMA and previous prediction model FHWA-RD-77-108. ORNAMENT is a modification of the FHWA-RD-77-108 model to simplify calculations and to account for Ontario's then-current vehicle fleet. The MTO Guide identifies both ORNAMENT and STAMINA 2.0 as the two noise prediction models approved for use by the MTO. TNM's capabilities in handling receptors and complex modelling inputs is better than ORNAMENT but still has its limitations. The CadnaA software has the strongest capabilities in dealing with GIS data, complex topography and generating noise contours. Based on past experience, using RLS 90 for the road traffic sources provide prediction results consistent with actual noise levels and those predicted using the MECP's ORNAMENT.

The traffic noise assessment will incorporate the following:

- Community-based polices concerning noise, if applicable;
- Existing and foreseeable future noise sensitive receptors, as defined under TISG requirements, and provincial and federal noise guidelines;
- Permissible sound levels at the assessed receptors;
- CAR plan and profile alignments;
- Receptor setback distance from CAR;
- Predicted future day / night traffic volumes and vehicle composition;
- Anticipated speed limits;
- CAR and receiver ground elevations;
- Screening effects due to berms and other structures (e.g., dwellings), where applicable; and
- Ground absorption.

Where roadway parameters are not available (e.g., traffic composition), the assessment will incorporate standard parameters (e.g., heavy and medium truck percentages) considered appropriate for the Project provided from readily available public information (e.g., MTO, MECP, American Association of State Highway and Transportation Officials, US Environmental Protection Agency, USFHWA) but subject to approval by MFFN. The road traffic noise predictions will be used for the calculation of the descriptors and criteria described above. Given the remote location of the Project area and value placed on “peace and quiet”, calculation of the change in %HA will incorporate the appropriate adjustments described in the Health Canada guide (e.g., +10 dB adjustment added to both the baseline and Project noise levels).

Noise levels due to construction activities and stationary sources will be predicted in accordance with ISO Standard 9613-1 (Acoustics – Attenuation of sound during propagation outdoors – Part 1: Calculation of absorption of sound by the atmosphere); and ISO Standard 9613-2 (Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation). This modelling method is accepted by numerous regulators across Canada including the MECP. The construction activities and stationary source noise assessment will incorporate the following:

- Community-based policies concerning noise, if applicable;
- Existing and foreseeable future noise sensitive receptors, as defined under TISG requirements, and provincial and federal noise guidelines;
- Source operating times / durations and spectral source noise emissions using manufacturers data or data collected from similar equipment for other projects;

- Assessment against provincial guidelines:
  - The MECP noise guideline NPC-104 adjustments (e.g., +5 dB adjustment to tonal and cyclic noise sources, +10 dB adjustment to quasi-steady noise sources, and +3 to +20 dB adjustment to intermittent noise sources) for the provincial noise impact assessment;
- Assessment against federal guidelines:
  - Health Canada guide adjustments (e.g., +10 dB adjustment for quiet rural areas added to both the baseline and Project construction noise levels, +5 dB adjustment to audibly tonal and regular impulsive noise sources, and +12 dB adjustment to highly impulsive noise sources) for the %HA assessment;
- Source-receptor separation distance and geometric divergence (e.g., distance attenuation);
- Atmospheric and ground absorption;
- Topography; and
- Screening effects due to intervening structures.

Where construction and stationary noise source parameters are not available (e.g., sound level spectrum), the assessment may incorporate data from industry standard reference publications (e.g., BSI BS 5228-2:2009 or USFTA Noise and Vibration Manual), manufacturers' noise data, or data collected from similar equipment for other projects.

Project vibration levels will be predicted using the general assessment formulae provided in the USFTA manual. Where vibration source parameters are not available (e.g., vibration emissions), the assessment may incorporate data from industry standard reference publications (e.g., BSI BS 5228-1:2009 or USFTA Noise and Vibration Manual); or data collected from similar equipment for other projects. Note, the necessity of construction vibration studies is dependent on the proximity of the project activities to vibration sensitive receptors. The Project includes quarries and pits to provide crushed rock and granular materials for the construction of the road and temporary access roads. The need for construction vibration studies will be determined once the locations of ancillary Project operations have been confirmed, and sensitive receptors have been identified.

Where possible, receptor locations and time periods will be incorporated with consideration of relevant input collected through community consultations and the Indigenous Knowledge Program, such as: typical sleep hours, and the expectation of quiet at specific locations or times. Hourly baseline noise levels will be calculated to support identification of time periods that tend to be quieter than others.

## 9.5 Mitigation and Enhancement Measures

Once potential effects have been identified, the effects assessment will explore technically and economically feasible mitigation measures to avoid or minimize the identified negative effects and enhancement measures to increase positive effects beyond those that are already inherent to the design. These measures will consist of industry-standard practices, federal and provincial standard specifications, regulator-mandated measures, best management practices, Indigenous and community recommendations and recommendations from industry and environmental professionals based on expertise, scientific publications, experience and judgement. General noise and vibration mitigation measures and recommendations include:

- Where noise barriers are recommended, incorporate continuous construction (e.g., no gaps, voids, or holes) using a material that meets a minimum surface density of 20 kg/m$^{2,}$ or a sound transmission class (STC) rating of 32, and construct the barriers to a height that provides a minimum 5 dB reduction;
- Maintain equipment in an operating condition that prevents unnecessary noise, including but not limited to, effective muffler systems, properly secured components, and the lubrication of moving parts;
- Restrict idling of equipment to the minimum necessary to perform the specified work;
- Ensure vehicles employed continuously on site for extended periods of time (two days or more) are fitted with sound reducing back-up (reversing) alarms;
- Avoid unnecessary revving of engines and switch off equipment when not required (do not idle);
- Adhere to local by-law requirements and the terms of any granted by-law exemptions, particularly if construction activities need to be undertaken at night-time;
- If construction needs to be undertaken outside of the normal daytime hours, inform residents beforehand of the type of construction planned and the expected duration;
- Use construction equipment compliant with noise level specifications in the MECP guidelines NPC-115 and NPC-118;
- Minimize drop heights of materials;
- Offset usage of active heavy equipment (schedule non-concurrent use);
- Implement noise compliance checks to ensure equipment levels comply with the MECP guidelines NPC-115 and NPC-118;

- Implement vibration compliance checks when blasting in quarries to ensure levels comply with the MECP guideline NPC-119;
- Implement vibration compliance checks when blasting during construction to ensure levels comply with OPSS 120;
- Implement vibration compliance checks during general non-blasting construction activities to ensure levels comply with reference vibration limits from applicable by-laws;
- Reroute construction and truck traffic, when and where feasible and as required;
- Co-ordinate 'noisy' operations such that they will not occur simultaneously, where possible;
- Implement the use of alternative construction equipment or methods to reduce noise emissions from construction as required.
- Utilize alternative equipment that generates lower noise levels or optimize silencer / muffler / enclosure performance as required;
- Use rubber linings in chutes and dumpers to reduce impact noise;
- Install acoustic enclosures, noise shrouds or noise curtains around noisy equipment;
- Install temporary noise barriers / solid construction hoarding on site boundary to screen affected locations as required;
- Where possible, build construction camps away from areas that are traditionally used for outdoor activities (e.g., hunting, fishing and trapping);
- Develop a complaint resolution process to describe what action will be taken in the event of noise and vibration complaints during Project construction or operations.

At a minimum, the noise and vibration assessments will assess the worst-case receptors which are generally those closest to the noise and vibration generating activities. If the corresponding criteria is met at the near receptors, the criteria is also expected to be met at further receptors. If mitigation is required to meet the criteria at the nearest receptors, and the mitigation enables the Project noise and vibration levels to meet the criteria, the further receptors are also expected to meet the criteria.

It is important that mitigation and enhancement measures are achievable, measurable and verifiable and monitored for compliance and effectiveness during all temporal phases as part of the Project follow-up monitoring plan. Required environmental monitoring will verify the potential environmental effects predicted in the IS / EA Report, evaluate the effectiveness of mitigation and enhancement measures, and identify the process the Proponent will follow if mitigation and enhancement measures are not effective.

## 9.6 Residual Effects

Residual effects are the effects remaining after the application of mitigation measures. The IS / EA Report will describe in detail the potential adverse and positive residual effects in relation to each temporal phase of the Project (e.g., construction, operation). Residual effects will be described using criteria to quantify or qualify adverse and positive effects, taking into account any important contextual factors. The residual effects will therefore be described in terms of the direction, magnitude, geographic extent, duration, frequency, likelihood, and whether effects are reversible or irreversible[12]. Ecological and socio-economic context may also be relevant when describing a residual effect. Context relates to the existing setting, its level of disturbance and resilience to adverse effects. Context can also relate to timing as it applies to assessing the worst-case scenario (e.g., effect during migratory or calving season for wildlife). Where appropriate, information regarding residual effects will be disaggregated by sex, gender, age and other community relevant identifying factors to identify disproportionate residual effects for diverse subgroups.

For magnitude, environmental discipline-specific definitions are required and are proposed below in **Table 9-10**.

**Table 9-10: Acoustic and Vibration Environment Magnitude Definition**

| Valued Component | Magnitude Level | Definition | Rationale |
|---|---|---|---|
| **Noise** | Low | ■ Project noise levels do not exceed federal and provincial limits | ■ Established noise limits based on federal and provincial guidance |
| **Noise** | High | ■ Project noise levels exceed federal and provincial limits | |
| **Vibration** | Low | ■ Project vibration levels do not exceed reference Municipal and industry limits | ■ Municipal (within Ontario) guidance and standard industry thresholds |
| **Vibration** | High | ■ Project vibration levels exceed reference Municipal and industry limits | |

*12. TISG Section 13.1 identifies additional effects characteristics for certain disciplines (e.g., wetlands, birds, terrestrial wildlife, species at risk). These additional effects characteristics are described in the respective discipline-specific study plans.*

# 9.7 Consideration of Sustainability Principles

The following provides a generic description of how sustainability principles will be considered in the effects assessment. The extent to which sustainability principles apply to a specific VC will vary depending on the nature of the VC and the potential for Project effects on the VC.

The effects assessment approach for the Project has included the consideration of the sustainability principles outlined in the Project TISG and the Agency's guidance on sustainability. The sustainability principles that have been considered include:

1. Consider the interconnectedness and interdependence of human-ecological systems;
2. Consider the well-being of present and future generations;
3. Consider positive effects and reduce adverse effects of the Project; and
4. Apply the precautionary principle by considering uncertainty and risk of irreversible harm.

The interconnectedness and interdependence of human-ecological systems will be considered through the assessment of potential indirect effects of each alternative. An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental discipline (e.g., changes in vegetation could indirectly affect wildlife). A preliminary assessment of indirect effects has been included in **Section 9.3**.

The well-being of present and future generations will be considered in the effects assessment through the application of the long-term operations phase temporal boundary of 75 years (**Section 6.1**) and through the effects characteristics description of duration and reversibility for each residual effect predicted.

The consideration of positive effects and reducing adverse effects of the Project is fundamental to the effects assessment methodology through the identification of mitigation measures to reduce potential adverse effects and the identification of the preferred alternative through the evaluation of advantages (e.g., positive effects) and disadvantages (e.g., adverse effects).

The effects assessment will apply the precautionary principle by clearly describing and documenting all uncertainties and assumptions underpinning the analysis and identifying information sources. The effects assessment will consider risk of irreversible harm through the effects characteristics description of reversibility for each residual effect predicted and will describe any uncertainty associated with the assessment of residual effects.

The scope of the sustainability assessment will be defined by issues of importance identified by Indigenous communities and interested persons through consultation and engagement activities, while also ensuring to be inclusive of the diversity of views expressed. The selection of VCs that will be the focus of the sustainability assessment will be aligned with the issues of importance identified by Indigenous communities and interested persons, as well as residual effects identified through the effects assessment process. The sustainability assessment will describe how the planning and design of the Project, in all phases including follow-up monitoring, considered the sustainability principles.

## 9.8 Consideration of Identity and Gender-Based Analysis Plus in Effects Assessment

The Proponent recognizes that communities and sub-populations within those communities may be impacted differently by the Project with respect to VCs and indicators. As such, the Project aims to collect baseline information for the purpose of assessing differential effects and establishing relevant mitigation measures, as further elaborated on in **Section 4.3**. Gender-Based Analysis Plus will not be limited to community feedback, when offered or discussed in secondary texts, additional sub-population information as is applicable to the relevant assessment will be incorporated.

## 9.9 Follow-up Programs

A follow-up program verifies the accuracy of the effects assessment and evaluates the effectiveness of mitigation measures. Identification of follow-up programs for the Project are not described in this Study Plan as the information needed to determine environmental monitoring requirements is dependent on the outcome of the effects assessment and consultation with Indigenous communities, agencies and interested persons. Therefore, the Proponent will include information on follow-up programs, that address the requirements outlined in Section 26 of the TISG, in the IS / EA Report and will identify the compliance and effects monitoring activities to be undertaken during all phases of the Project, as required.

# 10. Assumptions

The assumptions that have been made in developing the Study Plan are detailed in **Section 9**. Any additional assumptions required to complete the effects assessment, for example the assumed average daily traffic on the CAR, will be clearly identified and a rationale provided in the IS / EA Report.

# 11. Concordance with Federal and Provincial Guidance

This section provides the best information currently available on how federal and provincial requirements identified for the Project to date will be addressed. The final concordance with federal and provincial requirements will be included in the IS / EA Report, and will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

## Table 11-1: Study Plan Federal Concordance – Conformance with Requirements

| ID # | Federal TISG Reference [13] | Requirement / Comment / Concern | Response | Study Plan Reference |
|---|---|---|---|---|
| 1 | TISG Section 05.1, page 22 | ■ Any proposed mitigation measures are to be clearly linked, to the extent possible, to valued components in the Impact Statement as well as to specific project components or activities, as well as comments raised during engagement activities. | ■ Mitigation measures will be included in the IA/EA. | ■ Section 9.5 |
| 2 | TISG Section 07.1, page 30 | ■ The Impact Statement must establish appropriate study area boundaries to describe the baseline conditions. The study area boundaries need to encompass the spatial boundaries of the Project, including any associated project components or activities, and the anticipated boundaries of the Project effects, including all potentially impacted local communities, municipalities and Indigenous groups. Considerations in assigning appropriate study areas or boundaries would include, but not be limited to:<br>• areas potentially effected by changes to water quality and quantity or changes in flow in the watershed and hydrologically connected waters;<br>• areas potentially effected by airborne emissions or odours;<br>• areas determined by dispersion and deposition modelling;<br>• areas within the range of vision, light and sound and the locations and characteristics of the most sensitive receptors;<br>• species habitat areas, usage timing and migratory patterns;<br>• emergency planning and emergency response zones;<br>• the geographic extent of local and regional services;<br>• any impacted local communities, including municipalities;<br>• all potentially impacted Indigenous groups;<br>• areas of known Indigenous land, cultural, spiritual and resource use; and<br>• existing effected infrastructure. | ■ The Study Areas are defined and described in this Study Plan. | ■ Section 6.2<br>■ Section 7.2 |
| 3 | TISG Section 07.1, page 30 | ■ If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the study area, modelling methods must be described and must include assumptions, calculations of margins of error and other relevant statistical information. Models that are developed should be validated using field data from the appropriate local and regional study areas. Ensure baseline data is representative of project site conditions. If surrogate data from reference sites are used rather than site-specific surveys, the proponent should demonstrate that the data are representative of project site conditions. | ■ We will include details on modeling methods and discuss confidence in using desktop and/or field studies when describing baseline conditions. | ■ Section 7.2<br>■ Section 8 |
| 4 | TISG Section 07.1, page 31 | ■ Where baseline data are available in geographic information system (GIS) format, this information is to be provided to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard. This would support the Government of Canada's commitment to Open Science and Data and would facilitate the sharing of information with the public through the Canadian Impact Assessment Registry Internet Site and the Government's Open Science and Data Platform. The Agency intends to make the geospatial data files available to the public under the terms of the Open Government License – Canada. | ■ Data provided will meet ISO 19115 standards. | ■ Section 8 |
| 5 | TISG Section 07.2, page 32 | ■ The Impact Statement must provide detailed descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental, health, social and economic condition that is described, in order to corroborate the validity and accuracy of the baseline information collected. | ■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA/EA and are summarized in this Study Plan. | ■ Section 7.2<br>■ Section 9.2<br>■ Section 9.4 |

*13. Federal TISG Reference should be the Section or subsection, page etc. that clearly identifies where comment/issue we are addressing can be found (ex. Section 8.1 of TISG)*

| ID # | Federal TISG Reference [13] | Requirement / Comment / Concern | Response | Study Plan Reference |
|---|---|---|---|---|
| **6** | TISG Section 07.2, page 33 | ■ Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to. | ■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA/EA and are summarized in this Study Plan. | ■ Section 7 |
| **7** | TISG Section 07.2, page 33 | ■ If using existing data sources, the Impact Statement must provide justification to show that the data sources are relevant in spatial and temporal coverage to the Project. Some data sources may have good coverage in Southern Ontario or existing road networks but be unsuitable as a baseline for these northern areas where there are not roads. | ■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS/EA reports. | ■ No reference |
| **8** | TISG Section 07.2, pages 31-33 | ■ Information sources and data collection methods used for describing the baseline environmental, health, social and economic setting may consist of the following sources of information. For specific sources of baseline information, see Appendix 1.<br>Federal government (e.g., Environment and Climate Change Canada, Health Canada, Indigenous Services Canada, Statistics Canada, Women and Gender Equality Canada);<br>• Ontario provincial government (e.g., Ministry of Environment, Conservation, and Parks, Ministry of Natural Resources and Forestry;<br>• Bird Conservation Region plans;<br>• academic institutions;<br>• field studies, including site-specific survey methods;<br>• database searches, including:<br>• federal, provincial, territorial, municipal and local data banks;<br>• Breeding Bird Atlas - Ontario (2001-2005)<br>• monitoring program databases protected areas, watershed or coastal management plans;<br>• natural resource management plans;<br>• species recovery and restoration plans;<br>• field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape);<br>• land cover data, including:<br>• terrestrial ecosystem mapping products;<br>• forest cover maps;<br>• remote sensing resources;<br>• important habitats and features to include:<br>▪ water bodies, wetlands, watercourses;<br>▪ riparian habitat;<br>▪ river banks or other eroded habitats;<br>▪ artificial water sources;<br>▪ forest, tree patches, solitary trees (especially old decaying trees);<br>▪ forest edges and tree rows;<br>▪ ridges, including eskers;<br>▪ caves and mines;<br>▪ cliffs, rock outcrops, exposed bedrock, talus, and other karst topography;<br>▪ buildings, bridges, and other anthropogenic features, including linear features;<br>▪ sources of artificial lighting attracting insects;<br>▪ critical habitat; and | ■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS/EA reports. | ■ Section 5<br>■ Section 7 |

| ID # | Federal TISG Reference [13] | Requirement / Comment / Concern | Response | Study Plan Reference |
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| | | ▪ and any other habitat features known to be important in the area.<br>• Published literature, such as peer reviewed journals, reports by think tanks, non-government organizations and government reports;<br>• environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area;<br>• regional studies, project assessments and strategic assessments;<br>• renewable harvest data;<br>• Indigenous knowledge, including oral histories and knowledge gathered by spending time on the land with knowledge holders;<br>• community based monitoring and studies conducted by Indigenous communities;<br>• expert, community, public and Indigenous engagement and consultation activities, including workshops, meetings, open houses, surveys;<br>• qualitative information gathered from interviews, focus groups or observation;<br>• census data;<br>• baseline human health risk assessments;<br>• community and regional economic profiles;<br>• community well-being studies; and<br>• statistical surveys, as applicable. | | |
| **9** | TISG Section 07.4.1, page 36 | ■ For valued components establish three study area spatial boundaries to assess impacts to each valued component:<br>1) Project Study Area: defined as the project footprint for each alternative route;<br>2) Local Study Area: defined for each valued component – see below;<br>3) Regional Study Area: defined for each valued component – see below<br>■ Provide a rationale for boundaries of the project study area, local study area, and regional study area for each valued component and indicate how the above objectives were met in establishing the boundaries. | ■ The Study Areas are defined and described in this Study Plan. | ■ Section 6.2 |
| **10** | TISG Section 07.4.1, pages 35-36 | ■ The Impact Statement must describe the spatial boundaries, including project, local and regional study areas, for each valued component included in assessing the potential adverse and positive environmental, health, social and economic effects of the Project and provide a rationale for each boundary. Spatial boundaries are defined taking into account the appropriate scale and spatial extent of potential effects and impacts of the Project; community knowledge and Indigenous knowledge; current or traditional land and resource use by Indigenous groups; exercise of Aboriginal and Treaty rights of Indigenous peoples, including cultural and spiritual practices; and physical, ecological, technical, social, health, economic and cultural considerations. The size, nature and location of past, present and foreseeable future projects and activities are factors that should be included in the definition of spatial boundaries. It should be noted that in some cases, spatial boundaries might extend to areas outside of Canada. These transboundary spatial boundaries should be identified where transboundary effects are expected. | ■ The Study Areas are defined and described in this Study Plan. | ■ Section 6.2 |
| **11** | TISG Section 07.4.2, page 37 | ■ The temporal boundaries of the impact assessment span all phases of the Project determined to be within the impact assessment. If potential effects are predicted after project decommissioning or abandonment, this should be taken into consideration in defining specific boundaries. In order to assess a project's contribution to sustainability, consideration should be given to the long-term effects on the well-being of present and future generations. When defining temporal boundaries, the proponent should consider how elements of environmental, health, social and economic well-being that local communities, including municipalities, and Indigenous groups identify as being valuable could change over time. | ■ The Study Areas are defined and described in the Study Plan. | ■ No reference |
| **12** | TISG Section 08.1, page 39 | ■ The Impact Statement must provide current ambient noise levels at key receptor points to traditional land users and sensitive human receptors, including the results of a baseline ambient noise survey and permissible sound levels for each receptor. Information on typical sound sources (both natural and anthropogenic), geographic extent and temporal variations will be | ■ Section 7.1 includes details on POR and how they will be identified for the purposes of baseline and effects assessment.<br>■ Section 9.2 details the assessment VCs and indicators. A description of how these correlate to effects on humans is also provided. | ■ Section 7.1<br>■ Section 9.2<br>■ Section 9.4 |

| ID # | Federal TISG Reference [13] | Requirement / Comment / Concern | Response | Study Plan Reference |
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| | | included. When collecting baseline ambient noise survey data at human receptor locations, consider the following recommended questions:<br>• Does the community or land users value certain non-anthropogenic (i.e., natural) sounds?<br>• Is there an expectation of quiet at any specific locations or times?<br>• What are typical sleep hours (10:00 pm to 7:00 am being the default assumption)?<br>• What is the baseline prevalence of noise annoyance toward existing noise sources (e.g., road traffic, aircraft, and other industrial sounds)? | ■ Section 9.4 has been revised to include numerous indicators related to night-time operations and noise events. | |
| **13** | TISG Section 08.1, page 39 | ■ The Impact Statement must provide the approximate number, distance and identity factors of likely human receptors, including any foreseeable future receptors, that may be impacted by changes in air, water, country food quality (e.g., dust deposition on vegetation), and noise levels. At minimum, provide a map showing approximate locations of permanent residences, temporary land uses (e.g., cabins and traditional sites) and known locations of sensitive human receptors (e.g., schools, hospitals, community centres, retirement complexes or assisted care homes). | ■ Acoustic and Vibration Environment Study will identify noise sensitive receptors and will include corresponding visual aids. | Section 9.4.4 |
| **14** | TISG Section 13, pages 80-83 | ■ This section of the TISG describes the methodology for the effects assessment, including definitions of scope, severity, and irreversibility. | ■ This information will be included in the EA/IS Report and is summarized in the Study Plan. | ■ Section 9 |
| **15** | TISG Section 14.1, page 85 | ■ The Impact Statement must describe changes in ambient vibration and other sound levels resulting from the Project at potential receptor locations, including changes to the perception of non-anthropogenic sounds. | ■ Ambient noise includes both anthropogenic and non-anthropogenic sounds. Ambient monitoring datasets include thousands of datapoints, and it is impractical to separate anthropogenic and non-anthropogenic events. Where applicable, the Acoustic and Vibration Environment Study will describe changes to the perception of sound with respect to the baseline ambient levels (e.g., anthropogenic + non-anthropogenic sounds). | ■ Section 9.4 |
| **16** | TISG Section 14.1, page 85 | ■ The Impact Statement must quantify sound levels at appropriate distances from any Project facility and/or activities and describe for each contributing source the timing (e.g., hours of night-time activities), number and duration of noise events and their sound characteristics, including frequency spectrum. | ■ We will describe noise source characteristics used in the noise impact assessment(s). | ■ Section 9.4 |
| **17** | TISG Section 14.1, page 86 | ■ In regards to changes to the atmospheric, acoustic, and visual environment, the Impact Statement must describe any positive changes. | ■ The effects assessment will identify positive and adverse effects that may be caused by the Project, on the environment. | ■ Section 9 |
| **18** | TISG Section 14.1, page 86 | ■ The Impact Statement must consider the expectation of peace and quiet at receptors (e.g., in a quiet rural area or during Indigenous land use) and the applicable community-based policies concerning noise (e.g., complaints resolution processes). | ■ Acoustic and Vibration Environment Study will consider community input and applicable policies. Further information will be provided in the IS/EA Report. | ■ Section 4<br>■ Section 9.4 |
| **19** | TISG Section 14.1, page 86 | ■ The Impact Statement must describe the locations and characteristics of the most sensitive receptors including species at risk and differential effects for sensitive receptors. | ■ Section 7.1 of the updated study plan provides preliminary information on the selection criteria for sensitive receptors based on existing and potential human activity. Section 9.3 of the updated study plan provides preliminary information on the interaction of effects and the interconnectedness of the VCs. Effects on species at risk as a result of changes in noise and vibration will be assessed, where applicable (refer to Wildlife and Ungulates Study Plans). Further information will be provided in the IS / EA Report. | ■ Section 7.1<br>■ Section 9.3;<br>■ Wildlife Study Plan<br>■ Ungulates Study Plan |
| **20** | TISG Section 14.1, page 86 | ■ The Impact Statement must identify and justify the approach to determine the extent to which sound effects resulting from the Project are adverse and describe any changes in night-time light levels as a result of the Project. | ■ Acoustic and Vibration Environment Study will assess adverse noise impacts using accepted industry, Provincial, and Federal descriptors, including noise at night, if applicable. | ■ Section 9.4 |
| **21** | TISG Section 14.1, page 86 | ■ The Impact Statement must provide the hourly distribution of baseline noise events at night in comparison to predicted individual noise events at night at each receptor location. | ■ Acoustic and Vibration Environment Study will present hourly baseline results of the field monitoring program. Noise impact assessment will include a comparison of predicted noise levels and measured baseline levels. | ■ Section 4.1<br>■ Section 9 |

| ID # | Federal TISG Reference [13] | Requirement / Comment / Concern | Response | Study Plan Reference |
|---|---|---|---|---|
| **22** | TISG Section 15.2, page 94 | ■ The Impact Statement must describe the incidental effects caused by increased disturbance (e.g., sound, artificial light, presence of workers), relative abundance movements, considering the critical periods for the birds, including but not limited to breeding, migration and overwintering. | ■ The identification of Points of Reception (POR) is described in Section 7.1 of the Study Plan and will include sensitive features, such as species at risk and other wildlife. Effects on species at risk as a result of changes in noise and vibration will be assessed, where applicable.<br>■ Section 9.3 of the updated study plan provides preliminary information on the interaction of effects and the interconnectedness of the VCs. Effects on species at risk as a result of changes in noise and vibration will be assessed, where applicable (refer to Wildlife Study Plans). Further information will be provided in the IS / EA Report.<br>■ Refer to the Visual Study Plan for information on light assessment. | ■ Section 7.1<br>■ Section 9.3;<br>■ Wildlife Study Plan<br>■ Visual Environment Study Plan |
| **23** | TISG Section 16.1, Page 103 | ■ With respect to biophysical determinants of health, the Impact Statement must provide an assessment of adverse and positive effects on human health in consideration of, but not limited to, potential changes in:<br>• noise exposure;<br>• effects of vibration; | ■ The effects assessment will identify positive and adverse effects that may be caused by the Project, on the environment.<br>Refer to the Human Health and Community Safety Study Plan for more information on human health effects. | ■ Section 9.4; Human Health and Community Safety Study Plan |
| **24** | TISG Section 20, page 119-128 | ■ Section 20 of the TISG describes the requirements around mitigation and enhancement measures that must be considered in the Impact Statement. | ■ Mitigation measures will be informed by best management practices, applicable resource management and/or recovery plan, Indigenous input, and industry standards. | ■ Section 9.5 |
| **25** | TISG Section 21, pages 129-130 | ■ Section 21 of the TISG describes the requirements and guidance associated with determining residual effects. | ■ Residual effects will be assessed in the IA/EA. | ■ Section 9.6 |
| **26** | TISG Section 22, pages 131-133 | ■ Section 22 of the TISG describes the guidance around conducting cumulative effects assessment for the project. | ■ Cumulative effects assessment will be conducted as part of the IA/EA. | ■ No reference |
| **27** | TISG Section 25, pages 139-140 | ■ Section 25 of the TISG provides guidance on how to demonstrate the Project's contributions to sustainability. | ■ The IA/EA will include discussion on how the project contributes to sustainability and is summarized in the Study Plan. | ■ Section 9.7 |
| **28** | TISG Section 26, pages 141-144 | ■ Section 26 of the TISG includes a description of the considerations for developing a follow-up program for environmental, health, social or economic effects, as applicable. | ■ The IA/EA will include descriptions of follow up programs, as required by VC. | ■ No reference |

## Table 11-2: Study Plan Provincial Concordance – Conformance with Requirements

| ID # | Comment from Regulatory Agency | Comment Type | Requirement / Comment / Concern | Response | Study Plan Reference |
|---|---|---|---|---|---|
| **1** | MECP | ■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM | ■ Study areas are missing and lack clarity – maps show study area for 4 routes even though only 2 (or 1?) routes are proposed to be assessed; no indication of local and regional study areas for each environmental component (e.g. ground water, surface water, caribou, etc.). | ■ The Study Areas are defined and described in this Study Plan. | ■ Section 6.2 |
| **2** | MECP | ■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental, MECP Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR | ■ Assessment Methods<br>– For the most part, section 7.2 provides a description of potential environmental effects for each discipline. However this section also includes assessment methodologies for some subsections (7.2.1 and 7.2.2 AERMOD modelling, quantitative noise assessment) while the majority do not (7.2.3 – 12). The level of detail in the ToR about assessment methods should be consistent for all environmental components. It is strongly recommended to include commitments to develop work plans at the outset of the EA phase, including opportunities for technical review by agencies and others. The work plans should include assessment methodology appropriate for each environmental component. The ToR could include a high level summary table for each environmental discipline listing data collection and assessment methods, with a commitment to develop the work plans at the outset of the EA phase to provide more details. Consider where the information about air and noise modelling is best placed. | ■ The Study Plan meets this requirement. | ■ Section 7<br>■ Section 8 |
| **3** | MECP | ■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental, MECP Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR | ■ #16 Section 8 Page 54<br>– Work Plans - Section 8 describes the approach that will be taken to evaluate alternative methods during the EA, including proposed criteria and indicators (presented in Appendix A). The information presented is high level and does not provide an opportunity for technical review of the methodologies that will be applied to evaluate those specific criteria and indicators.<br>It is strongly recommended to include commitments to develop work plans at the outset of the EA phase, including opportunities for technical review by agencies and others. | ■ The Study Plan meets this requirement. | ■ Section 9 |
| **4** | MECP | ■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR | ■ #17 Section 8 Page 54 Consultation on Assessment Methodology<br>– MFFN acknowledges that the proposed methodology will be open to input during the draft ToR review, but also says a more detailed method will be presented in the EA. Page 47 indicates the effects assessment criteria will be developed during the EA. While it is appropriate to defer some detailed work planning to the EA phase, the ToR should include commitments for how technical reviewers, and other interested persons, will be consulted during the development of specific evaluation methodologies or technical work plans. It is strongly recommended that those opportunities for review occur prior to the completion of studies (e.g. prior to the submission of a draft or final EA document).It is not clear whether MFFN plans to consult on the more detailed methodology and criteria during the EA phase or if the ToR phase is the main opportunity to provide input. Please indicate how consultation on the ToR has informed the preliminary criteria and indicators. Please clarify when MFFN will consult and provide opportunity for input on the detailed assessment method, including criteria and indicators (and work plans as MECP has proposed), with agencies, communities and stakeholders during the EA phase in order to finalize the methodologies before EA studies get advanced. | ■ The Study Plan meets this requirement. As identified in Section 4.2 of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in Table 4-1, which is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a). Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in Section 5 of the Study Plan. Section 5 of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program. | ■ Section 4.2<br>■ Section 5 |

| ID # | Comment from Regulatory Agency | Comment Type | Requirement / Comment / Concern | Response | Study Plan Reference |
|---|---|---|---|---|---|
| **5** | MECP | ■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR | ■ #21 Section 10.2.4 Page 73 Technical Work Plans –<br>– Page 73 states that MECP has indicated it will not be commenting on work plans associated with field work until the ToR is finalized. This statement does not reflect MECP's guidance to the project team. MECP's guidance, which is documented on page 69 of the RoC, is that the ToR is the mechanism to seek technical review of work plans and that discipline- specific work plans should be included with the ToR. As well, discussions that MECP has had with the project team to date are considered pre-consultation, since it is the ToR that sets out what work is to be done during the EA phase. Please revise the statement on page 73 to state: "MFFN provided MECP and MNRF work plans associated with field work planned during 2019 for review, however MECP advised this is considered-consultation and that discipline-specific work plans should be appended to the ToR to allow full technical review. "As the draft ToR did not include detailed discipline-specific work plans, the other option the ministry strongly recommends is to include commitments to develop workplans at the outset of the EA phase, including opportunities for technical review. | ■ The Study Plan meets this requirement. | ■ No reference |
| **6** | MECP | ■ Email from Mike Landers, Senior Environmental Officer, Thunder Bay District Office, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR | ■ #3 7.1.4.2 Acoustic Environment 23 7.2.2 Acoustic Environment Pg. 49<br>– Due to the nature of the potential road base, vibration may also become an issue if road is located near sensitive receptors. | ■ Acoustic and Vibration Environment Study will use screening and Zone of Influence assessments to confirm if vibration due to Project activities may potentially impact receptors; and if detailed vibration studies are required. | ■ Section 9.4 |
| **7** | MNRF | ■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference | ■ Sec. 10.2.3 Public and other interested stakeholders (pg.71 )& 7.1.4.1 (Atmospheric environment) (pg.23) & 7.1.4.2 (Acoustic environment) (pg.24) & Appendix A draft criteria and indicators<br>– There is a listing of public and interested stakeholders identified in [the draft ToR]. … These stakeholders may also be considered for Points of Receptors for consideration of atmospheric (dust) and acoustic monitoring (for road construction and operation). We recommend that MFFN contact MECP for further information/consideration. | ■ Where possible, the Acoustic and Vibration Environment baseline study will consider relevant input from public and interested stakeholders. | ■ Section 4.1 |
| **8** | MNRF | ■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference | ■ Draft Criteria and Indicators for Alternatives Evaluation Appendix A<br>– Available resources to help inform the draft criteria and indicators include research publications and expert knowledge on topics such as stressor-effects pathways, cumulative effects, and associated environmental components and indicators.Contacting researchers such as Rob Mackereth (MNRF) who has published research on these topics and related subjects is encouraged. -Rempel, R.S., et. al. 2016. Support for development of a long term environmental monitoring strategy for the Ring of Fire area. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Science and Research Information Report IR-08. 34 p. + append. Catalogue-natural-resource-scientific-and-technical-publicationsWhile no specifics are provided in this submission, MNRF welcomes a discussion with MECP and ENDM to explore what (if any) role this project could play in advancing baseline information and long-term environmental monitoring for the Ring of Fire in partnership with First Nations communities. | ■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS/EA reports. | ■ Section 7<br>■ Appendix A |

## Table 11-3: Study Plan Federal and Provincial Concordance – Requirement Deviations

| ID # | Federal TISG Reference[14] or Provincial Draft ToR Comment Reference[15] | Requirement / Comment / Concern | Response (Rationale for not meeting requirement) | Justification (for not complying with requirement including for example scientific research, precedence) | Proposed TISG Amendment |
|---|---|---|---|---|---|
| **1** | TISG Section 7.2, page 33 | ■ With regard to field studies, survey work must be planned to include multiple sampling locations and multiple visits to each location to support all required assessment analyses. Existing data should be considered as a limited augmentation of this new data. See the "Establishing Baseline Conditions" (sections 8.5, 8.9, 8.10, 8.11) in this Tailored Impact Statement Guidelines for recommendations on survey design and methodology. Surveys and analyses should be conducted by qualified experts. Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to. | ■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA/EA and are summarized in this Study Plan. The acoustic field program was only one session (late fall 2019) in Marten Falls covering two (2) locations for long-term monitoring. There are no additional field monitoring programs proposed as part of the Study Plan. | ■ Sufficient field information is available through historic and/or recent field investigations to understand annual and seasonal variation. We have provided information regarding anticipated seasonal changes in noise levels in the project area in the Study Plan. | ■ Reword the requirement:<br>With regard to field studies, survey work must consider including multiple sampling locations and/or multiple visits to each location to support all required assessment analyses. Applicability of using existing data should be described in the IS report. See the "Establishing Baseline Conditions" (sections 8.5, 8.9, 8.10, 8.11) in this Tailored Impact Statement Guidelines for recommendations on survey design and methodology. Surveys and analyses should be conducted by qualified experts.<br>Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per Section 7.1). Justification should be provided to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to. |
| **2** | TISG Section 8.1, page 39 | ■ The Impact Statement must for the aquatic environment, provide current underwater soundscape and vibration descriptions of the study area and at the project site from various sources based on acoustic measurements. Provide information on vibration and sound sources, geographic extent and spatial and temporal variations within the water column; | ■ The Acoustic Environment Study Plan will assess acoustic impacts on human receptors only. Acoustic impacts and existing conditions related to underwater environments will not be determined or measured. | ■ Federal and Provincial noise guidelines have been developed based on research into human response to noise exposure. The noise guidelines do not address whether these criteria are applicable to wildlife, nor do the guidelines provide separate criteria for wildlife assessment. We are not aware of any underwater noise or vibration thresholds that would be applicable for this project. | ■ Remove this requirement. |

*14. Federal TISG Reference should be the Section or subsection, page etc. that clearly identifies where comment/issue we are addressing can be found (ex. Section 8.1 of TISG)*
*15. This should include ID # reference (from excel table you were provided with all Draft ToR comments) and commenter.*

# 12. References

AECOM Canada Ltd., 2020:
Marten Falls First Nation Proposed Terms of Reference Marten Falls Community Access Road – Environmental Assessment, Appendix B: Consultation & Engagement Plan to Support the Environmental Assessment / Impact Statement.

Alberta Energy and Utilities Board, 2007:
Energy Resources Conservation Board – Directive 038: Noise Control. Revised edition.

City of Toronto, 2008:
By-law No. 514-2008, City of Toronto Municipal Code Chapter 363, Building Construction and Demolition, with respect to regulation of vibrations from construction activity

Health Canada, 2017:
Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise https://www.ceaa.gc.ca/050/documents/p80054/119378E.pdf

Impact Assessment Agency of Canada, 2019:
*Impact Assessment Act*. https://laws-lois.justice.gc.ca/eng/acts/I-2.75/

Impact Assessment Agency of Canada, 2020:
Public Participation Plan for the Marten Falls Community Access Road Project Impact Assessment.

Impact Assessment Agency of Canada, 2020a:
Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment.

Impact Assessment Agency of Canada, 2020b:
Glossary of Terms for the impact assessment of designated projects under the IAA. https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/glossary-of-terms.html

Impact Assessment Agency of Canada, 2020c:
Tailored Impact Statement Guidelines for the Marten Falls Community Access Road Project. https://iaac-aeic.gc.ca/050/documents/p80184/133937E.pdf

Ministry of Environment, Conservation and Parks, 1978:
Model Municipal Noise Control By-Law Noise Pollution Control Guideline (NPC) Blasting, Publication NPC-119 (NPC-119). August 1978.

Ministry of Environment, Conservation and Parks, 2013:
Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 https://www.ontario.ca/page/environmental-noise-guideline-stationary-and-transportation-sources-approval-and-planning

Ministry of Transportation / Ministry of Environment, Conservation and Parks, 1996:
A Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments

Ministry of Transportation, 2006:
Environmental Guide for Noise

Ontario Government, 1990a:
*Environmental Assessment Act*. https://www.ontario.ca/laws/statute/90e18

Ontario Ministry of the Environment, 1978:
Model Municipal Noise Control By-Law - Final Report.

Ontario Provincial Standard Specification, 2014:
OPSS 120 General Specification for the Use of Explosives. November 2014.

U.S. Department of Transportation Federal Transit Administration, 2018:
Transit Noise and Vibration Impact Assessment Manual. September 2018.

# Appendix A

## Preliminary List of Data Sources

Alberta Energy and Utilities Board, 2007:
Alberta Energy Regulator (AER) Directive 038: Noise Control (Directive 038).

British Standards Institute (BSI), 2009:
British Standards Institute (BSI) BS 5228-1:2009, Code of practice for noise and vibration control on construction and open sites – Part 2 Vibration

British Standards Institute (BSI), 2009:
BS 5228-1:2009, Code of practice for noise and vibration control on construction and open sites – Part 1: Noise

Ministry of Transportation/Ministry of the Environment, Conservation and Parks, 1996:
A Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways and Environmental Assessments.

Ministry of Transportation/Ministry of the Environment, Conservation and Parks:
MTO/MECP Noise Protocol; A Protocol for Dealing with Noise Concerns During the Preparation, Review, and Evaluation of Provincial Highways Environmental Assessments

**Data from Previous EAs**

Ministry of Transportation, 2006:
Environmental Guide for Noise

Ministry of the Environment, Conservation and Parks, 2013:
Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300

**Field investigations**

Health Canada, 2017:
Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise

Health Canada, 2017:
Health Canada Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (Health Canada guide)

**Indigenous Knowledge**

Dillon, 2019:

Information on sensitive noise receptors from Indigenous communities, Indigenous groups, and traditional land-based rights holders (i.e., Indigenous Traditional Knowledge [ITK] (data provided by AECOM, generated by Dillon; non-buffered data received August 2019, buffered data received October 2019);

ISO, 1996:

ISO Standard 9613-1: Acoustics – Attenuation of sound during propagation outdoors – Part 1: Calculation of absorption of sound by the atmosphere

ISO, 1996:

ISO Standard 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation

Ministry of the Environment, Conservation and Parks, 2013:

MECP Environmental Noise Guideline - Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (NPC-300)

Ministry of the Environment, Conservation and Parks, 1978:

MECP Model Municipal Noise Control By-law Noise Pollution Control Guideline (NPC) Blasting, Publication NPC 119 (NPC 119).

Ministry of the Environment, Conservation and Parks, 1978:

MECP Model Municipal Noise Control By-law Noise Pollution Control Guideline (NPC) Construction Equipment, Publication NPC 115 (NPC 115)

Ministry of Natural Resources and Forestry:

MNRF Land Information Ontario (LIO) geographic datasets; and,

Natural Resources Canada CANVEC:

Natural Resources Canada CANVEC (CANVEC) geographic datasets.

Ontario Ministry of Transportation, October 2006:

Environmental Guide for Noise (MTO Guide).

Ontario Provincial Standard Specification, 2014:

Ontario Provincial Standard Specification (OPSS) 120, 2014: General Specification for the Use of Explosives;

Orthoimagery;

Proposed Project locations for the corridors;

U.S. Department of Transportation Federal Transit Administration (USFTA), 2018:

Transit Noise and Vibration Impact Assessment Manual

World Health Organization (WHO), 1999:

Guidelines for Community Noise (WHO, 1999)

# Appendix B

## Agency Comments on the Draft Study Plan

# Draft Study Plan Comments – Federal

| Comment # / Ref # | DRAFT Study Plan Section | TISG Section | Comment / Context | Action Item | Final Response | Study Plan Reference |
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| **AC-01** | ■ General Comment | ■ **Section 5, 6, 7, 13, 19.2, and 25** | ■ In addition to the required actions detailed below, other required actions to be addressed in the update to this study plan are detailed in a separate table titled "2020-07-02 - IAAC to MFFN- General Comments on MFCAR Draft Study Plans". The Agency has provided these other required actions to highlight common sections of the Tailored Impact Statement Guidelines (Guidelines) where requirements were not met in the draft study plans submitted to the Agency. These additional actions must be addressed in the updated study plans. | | ■ We have reviewed the relevant comments and incorporated where appropriate. Please refer to the General Comments Table Response submitted separately to the Agency for specific responses. | ■ Various Sections |
| **AC-02** | ■ General Comment | ■ **Section 9, 12.2, 12.4, 15.2, 15.3, 15.4, 16.1, 17.2, 19.1, and 20** | ■ The Guidelines include requirements beyond those in Sections 8.1 and 14.1 that are related to the acoustic environment (such as Sections 9, 12.2, 12.4, 15.2, 15.3, 15.4, 16.1, 17.2, 19.1 and 20). Changes to the acoustic environment could have effects on environmental, social, health and economic valued components, as well as effects to Indigenous peoples' current use of lands and resources for traditional purposes and conditions related to the impacts on rights of Indigenous peoples, for example. Whether in the acoustic environment study plan or in other topic specific study plans, there must be a demonstration of the approach to meet all requirements of the Guidelines, including those related to effects on community well-being from changes to soundscapes, and impacts of noise on the experience of a practice or the exercise of rights. The interactions of effects and the interconnectedness of the valued components is not apparent in this and other study plans. | | ■ Section 9.3 of the updated Study Plan provides preliminary information on the interaction of effects and the interconnectedness of the VCs. Further information will be provided in the IS / EA Report. | ■ Section 9.3 |
| **AC-03** | ■ **Section 3: Spatial Boundaries: Study Area**<br>– "Noise may affect nearby wildlife, which may affect outdoor recreational and teaching activities of the community and Indigenous groups such as hunting and trapping for recreational and food purposes. However, the federal and provincial noise guidelines do not quantify indirect acoustic effects; and the direct and quantifiable acoustics effects are expected to be limited to the LSA." | ■ **Section 19.1**<br>– "…The potential effects, to consider assessing include both adverse and positive effects to the current use of land and resources for traditional purposes, physical and cultural heritage, and environmental, health, social and economic conditions of Indigenous peoples impacted by the Project, including interferences of the Project with the following:<br>• quantity and quality of resources available for harvesting (e.g., species of cultural importance, including traditional and medicinal plants);…<br>• experiences of being on the land, including ability to pass on Indigenous knowledge and language (e.g., impacted from: changes in air quality, noise exposure, effects of vibrations from blasting and other activities);…" | ■ The study plan provides inadequate detail on the data that will be collected and analyzed to meet the noise impact assessment on the requirements related to Indigenous peoples described in Sections 19.1 of the Guidelines.<br>■ If information on impacts on Indigenous peoples from noise are expected to be assessed in other study plans (e.g., Indigenous peoples valued components, social, and land and resource use), this should be clearly presented. | ■ Provide further details that demonstrate the methodologies and approaches to studying the impacts of noise to Indigenous peoples, as required in Section 19 of the Guidelines.<br>■ Cross-reference any specific acoustic/noise methodologies and indicators that are to be found in other plans. | ■ As identified in Section 4.2 of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in Table 4-1, which is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a).<br>■ Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in Section 5 of the Study Plan. Section 5 of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program.<br>■ Section 9.3 of the updated Study Plan provides preliminary information on the interaction of effects and the interconnectedness of the VCs. Further information will be provided in the IS / EA Report. | ■ Section 4.2<br>■ Section 5<br>■ Section 9.3 |

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| **AC-04** | ■ **Section 3: Spatial Boundaries: Study Area**<br>– "the direct and quantifiable acoustics effects are expected to be limited to the Local Study Area." | ■ **Section 13.1**<br>– "…Predictions must be made on clearly stated assumptions and the Impact Statement must clearly describe how it has tested each assumption…" | ■ It is unclear how it was determined that the direct and quantifiable acoustics effects are expected to be limited to the Local Study Area. | ■ Provide details to demonstrate that direct and quantifiable acoustics effects are expected to be limited to the Local Study Area, considering the life of the Project and future uses of the road (including for mining purposes), and clearly identify the various noise receptors that are taken into account. | ■ The Study Areas are defined and described in this Study Plan.<br>■ Section 9.5 describes how the worst-case receptors will be assessed and their relevance to meeting noise and vibration criteria. The worst-case receptors are generally those located closest to the noise and vibration generating activities, and are likely located within the Local Study Area.<br>■ As noted in Section 9.4.1, if residual acoustic effects from the Project are predicted, a cumulative effects assessment will be carried out to assess the combined impact of the Project and other existing physical activities, as well as future physical activities that are certain and reasonably foreseeable. The cumulative effects assessment will consider other existing or future certain and reasonably foreseeable physical activities located within 5 km of Project receptors. | ■ Section 6 |
| **AC-05** | ■ **Section 4.1: 2019 Baseline Noise Field Program**<br>– "The field program was conducted in November 2019 and included a monitoring component (Baseline Noise Monitoring) and measurement component (Baseline Noise Measurements)… As a result of discussions with the Project Team, two representative sensitive receptor locations were selected for both the Baseline Noise Monitoring and Baseline Noise Measurements. The first receptor location was selected to correspond to a populated area where it was expected that the ambient levels would be influenced by human activities. A second receptor location, within the area located further from the community, was identified to document ambient levels characteristic of natural environment without the influence of human activities. These two locations are expected to allow the team to document the range in existing ambient noise levels within the LSA [local study area]. Data for the monitoring/measurements, and the corresponding reporting includes the following information for each location: | ■ **Section 8.1**<br>– "The Impact Statement must:…<br>• provide current ambient noise levels at key receptor points to traditional land users and sensitive human receptors, including the results of a baseline ambient noise survey and permissible sound levels for each receptor. Information on typical sound sources (both natural and anthropogenic), geographic extent and temporal variations will be included. When collecting baseline ambient noise survey data at human receptor locations, consider the following recommended questions:<br>▪ Does the community or land users value certain non-anthropogenic (i.e., natural) sounds?<br>▪ Is there an expectation of quiet at any specific locations or times?<br>▪ What are typical sleep hours (10:00 pm to 7:00 am being the default assumption)?<br>▪ What is the baseline prevalence of noise annoyance toward existing | ■ The study plan does not provide sufficient details on the methods used for the 2019 baseline noise field program. For example, it is unclear what the "populated area" and "further from the community" represents, or how they are representative of other communities in the LSA.<br>■ It is also unclear whether audio recordings were collected. This information is required to confirm that the 2019 study results and further work outlined in the study plan satisfy the requirements of Section 8.1 of the Guidelines and Health Canada's guidance on baseline noise measurements for the purpose of assessing effects of project-related noise on human health.<br>■ Health Canada recommends that noise assessments identify and describe any particular receptors that may have a heightened sensitivity to noise exposure (e.g. | ■ Update the study plan to describe how the 2019 monitoring locations are representative of baseline conditions at sensitive receptor locations (as per Section 8.1 of the Guidelines) and provide further details about the locations (e.g. provide a map).<br>■ Clarify the length and timing of monitoring and how temporal variability will be considered (e.g., seasonal variation in levels, types of community activity, weather conditions) (as per Section 8.1 of the Guidelines).<br>■ Clarify whether the collected baseline data includes audio recordings and whether any baseline ambient noise survey data [e.g., community annoyance with noise, measured as percent highly annoyed (%HA)] were collected from community members (as per Section 8.1 of the Guidelines). | ■ The acoustic field program was only one session (late fall 2019) in MFFN covering two (2) locations for long-term monitoring. There are no additional field monitoring programs proposed as part of the Study Plan. The results of the desktop and field assessment studies will be provided at a later date.<br>■ Sufficient information is available through desktop information and historic and/or recent field investigations to understand annual and seasonal variation. We have provided information regarding anticipated seasonal changes in noise levels in the project area in the Study Plan. Please refer to Table 11-3 for further information.<br>■ As identified in Section 4.2 of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in Table 4-1, which is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a). | ■ Section 7.2 |

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| | • (…)<br>• Recording mode; (…)"<br>■ **5. Data Management and Analysis**<br>– "(…) The screening will be completed using various tools, which may include audio recording (where deemed appropriate), analysis of the raw noise monitoring data in combination with meteorological data, or similar." | noise sources (e.g., road traffic, aircraft, and other industrial sounds)?... remote sensing resources;<br>• provide the approximate number, distance and identity factors of likely human receptors, including any foreseeable future receptors, that may be impacted by changes in air, water, country food quality (e.g., dust deposition on vegetation), and noise levels. At minimum, provide a map showing approximate locations of permanent residences, temporary land uses (e.g., cabins and traditional sites) and known locations of sensitive human receptors (e.g., schools, hospitals, community centres, retirement complexes or assisted care homes)." | Indigenous peoples, schools, child care centres, hospitals). Measured baseline noise levels should be provided for both daytime (Ld) and night-time (Ln) at all representative receptor locations. It is a good practice to identify the exact location of the baseline measurement (e.g. outdoors at a building facade, elevation, road intersection, etc.).<br>■ Observations on timing (i.e., weekday/weekend, seasonal activity), weather conditions, and noise sources also provide useful information on the context surrounding the baseline measurements.<br>■ Additional information on how to minimize uncertainty of the validity of measured baseline sound-level data can be found in Section 6.2.1 (page 13) of Health Canada Noise Guidance Document. | | | |
| **AC-06** | ■ **Section 4.2: Desktop Assessment**<br>– "This study plan focuses on the additional studies that are anticipated to be required to gather information beyond what is currently available through existing information sources".<br>■ **Section 7: Conformance with Federal and Provincial Guidance**<br>– Acoustic Environment Study will include a baseline ambient study that will inform permissible sound levels at sensitive receptors. Monitoring locations were selected to capture the range of existing noise sources considering numerous factors, including geographic and temporal variations. The baseline prevalence of noise annoyance will be captured by determining the baseline percent highly annoyed (%HA) level. This determination is required as part of the Acoustic Environment Study's change in %HA assessment. | ■ **Section 8.1**<br>– ""The Impact Statement must:…provide current ambient noise levels at key receptor points to traditional land users and sensitive human receptors, including the results of a baseline ambient noise survey and permissible sound levels for each receptor. Information on typical sound sources (both natural and anthropogenic), geographic extent and temporal variations will be included. When collecting baseline ambient noise survey data at human receptor locations, consider the following recommended questions:<br>• Does the community or land users value certain non-anthropogenic (i.e., natural) sounds?<br>• Is there an expectation of quiet at any specific locations or times? What are | ■ The study plan does not describe any additional baseline studies, suggesting that nothing more is anticipated and information on all sensitive human receptors and sensitive receptor locations are known and taken into account.<br>■ It is unclear how the approach proposed in the study plan will meet the requirements of Section 8.1 of the Guidelines.<br>■ The study plan does not describe how the proponent is planning to provide Indigenous groups and the public with an opportunity to share information on existing noise perception, concerns about the Project, and to comment on the list of valued components and indicators.<br>■ The Guidelines recommend that the proponent considers a | ■ Provide detail to demonstrate the proposed approach and methods used to meet the requirements of the Guidelines, particularly Section 8.1.<br>■ Update the study plan to include the list of all Indigenous groups that will be engaged, at a minimum the Indigenous groups listed in the Indigenous Engagement and Partnership Plan (IEPP), as part of the baseline data collection, defining the list of criteria and indicators, and effects assessment analysis. The list should be consistent throughout the study plan.<br>■ Provide further detail to describe how Indigenous groups and the public have been, or will be, provided an opportunity to inform | ■ Section 9.2 details the assessment VCs and indicators. A description of how these correlate to effects on humans is also provided.<br>■ Section 9.4 has been revised to include numerous indicators related to night-time operations and noise events. | ■ Section 9.2<br>■ Section 9.4 |

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| | | typical sleep hours (10:00 pm to 7:00 am being the default assumption)?<br>• What is the baseline prevalence of noise annoyance toward existing noise sources (e.g., road, traffic, aircraft, and other industrial sounds)?..." | baseline ambient noise survey and provides examples of recommended questions for gathering community feedback as part of a baseline noise study. | the acoustic baseline data collection and effects assessment. | | |
| **AC-07** | ■ **6.1 Indicators and Expression of Change**<br>– "The indicators have been determined for the Acoustic Environment through consideration of the following:<br>• human health effects;<br>• consultation with regulatory agencies and industrial stakeholders;<br>• potential presence within the area associated with the Project, and potential for alteration or disturbance as a result;<br>• social or economic importance; and<br>• any other relevant and credible source, such as scientific or academic publications or input from the public.(…)"<br>■ **Table 6-1: Acoustic Environment Indicators**<br>– "Expressions of change: Leq(1); Leq(16) Rationale for selection: Used in provincial guidelines to describe baseline noise levels, and assess stationary noise source effects; to assess road traffic noise effect<br>– Expression of change: %HA Rationale for selection: Used in federal guidelines to assess noise effects on human health and potential for complaints due to noise exposure" | ■ **Section 6**<br>– "…the proponent must provide Indigenous groups with an opportunity to:<br>• comment on the list of valued components and indicators;…"<br>■ **Section 14.1**<br>– "The Impact Statement must:…<br>• describe consultation with regulators, stakeholders, community groups, landowners and Indigenous groups about potential effects to the atmospheric, acoustic, and visual environment; …<br>• identify and justify the approach to determine the extent to which sound effects resulting from the Project are adverse…"<br>■ **16.1 Biophysical Determinants of Health**<br>– "With respect to biophysical determinants of health, the Impact Statement must(…)<br>• describe nuisances and environmental, social and economic changes that could potentially be sources of adverse human health effects and the potential human receptors of these effects;<br>• in situations where project related air, water or noise emissions meet local, provincial, territorial or federal guidelines, and yet public concerns were raised regarding human health effects, provide a description of the public concerns and how they were or are to be addressed."<br>• (…) The proponent should provide a detailed rationale/explanation for any | ■ Table 6-1 of the study plan provides a limited description of the indicators and their expression of change. It is unclear what each indicator measures, the rationale for including it and how a change will be interpreted.<br>■ It is important to consider that human health effects related to noise may be evaluated by a variety of endpoints and indicators. The evaluation of each potential noise-induced human health effect by one method alone is not necessarily representative of all possible human health effects related to noise exposure. For example, when using %HA as an indicator in a noise impact assessment, the change in %HA of receptors exposed to long-term noise may not exceed 6.5%, but these receptors may experience noise-induced hearing loss, sleep disturbance, or interference with speech comprehension.<br>■ Additionally, the indicators do not appear to have been selected considering public concerns. It is unclear why Indigenous groups are not listed among the elements taken under consideration for the determination of the list of indicators. | ■ Revise the study plan to provide a description of each indicator presented and describe each indicator's expression of change and potential interpretation for the effect analysis.<br>■ Clarify how the proposed indicators are appropriate to assess health-related effects at receptors due to noise-induced hearing loss, sleep disturbance, or interference with speech comprehension.<br>■ Provide details to demonstrate how Indigenous groups listed in the Indigenous Engagement and Partnership Plan that may have views on these studies have been/will be provided with an opportunity to comment on the list of indicators.<br>■ Clarify whether concerns relating to increased noise were raised by the public or Indigenous groups. | ■ The requested information has been provided in the updated Study Plan.<br>■ As identified in Section 4.2 of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in Table 4-1, which is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a).<br>■ Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in Section 5 of the Study Plan. Section 5 of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program. | ■ Section 4.2<br>■ Section 5<br>■ Section 9.2<br>■ Section 9.3 |

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| | | deviation from recommended assessment approaches/ methods, including Health Canada's guidance, or when determining such assessment is not warranted." | | | | |
| **AC-08** | ■ **Section 6.2 Methods for Predicting Future Conditions**<br>– "Where roadway parameters are not available (e.g., traffic composition), the assessment will incorporate standard parameters provided in provincial traffic noise guidelines". | ■ **Section 13.1**<br>– "…Predictions must be made on clearly stated assumptions and the Impact Statement must clearly describe how it has tested each assumption…" | ■ Where roadway parameters are not available, ensure that the parameters incorporated in the assessment are clearly described in the Impact Statement and confirm that are approved by Ontario. | | ■ Section 9.4.2 describes the provincial guidelines that will be used to assess traffic noise impacts. | ■ Section 9.4.2 |
| **AC-09** | ■ **6.2 Methods for Predicting Future Conditions**<br>– "Road traffic noise due to the Project will be predicted using an algorithm that is acceptable to the MECP [Ontario ministry of environment, conservation and parks] and MTO [Ontario ministry of transportation]. The traffic noise assessment will incorporate the following (…) Predicted future day/night traffic volumes and vehicle composition;<br>– Noise due to Project construction activities will be predicted using industry standard methods. Construction equipment noise emissions may be estimated using a combination of industry standard reference publications and noise levels collected from similar equipment for other projects. (…)<br>– Where possible, receptor locations and time periods should be incorporated with consideration of relevant input collected through community consultations and the Indigenous Knowledge Program, such as: typical sleep hours, and the expectation of quiet at specific locations or times." | ■ **Section 14.1**<br>– "The Impact Statement must:…<br>• describe changes in ambient vibration and other sound levels resulting from the Project at potential receptor locations, including changes to the perception of non-anthropogenic sounds;<br>• quantify sound levels at appropriate distances from any Project facility and/or activities and describe for each contributing source the timing (e.g., hours of night-time activities), number and duration of noise events and their sound characteristics, including frequency spectrum;<br>• provide the hourly distribution of baseline noise events at night in comparison to predicted individual noise events at night at each receptor location;… consider the expectation of peace and quiet at receptors (e.g., in a quiet rural area or during Indigenous land use) and the applicable community-based policies concerning noise (e.g., complaints resolution processes);<br>• identify and justify the approach to determine the extent to which sound effects resulting from the Project are adverse and describe any changes in night-time light levels as a result of the Project;…" | ■ The study plan does not provide sufficient details to confirm whether or how the following will be considered in the noise assessment:<br>– road traffic noise for the construction and operation phases of the Project;<br>– hourly distribution of noise events at night;<br>– construction lasting for periods greater than one year at any given location;<br>– noise-related complaints;<br>– anticipated relevant adjustment factors (e.g. for "quiet rural areas", time-of-day, tonal and/or impulsive noise); and<br>– cumulative effects with reasonably foreseeable future projects.<br>■ Additionally, the study plan does not specify which decision factors will be used to determine whether relevant input will be collected through community consultations and the Indigenous Knowledge Program. | ■ Provide detail in the study plan to demonstrate that road traffic noise will be assessed for all relevant phases of the Project.<br>■ Provide details to demonstrate that the effects assessment for the operation phase will include the effect cause by all different users (traffic volume, type of vehicles, etc.), including Indigenous groups, the general public, and mining proponents of reasonably foreseeable future projects ((e.g., Eagle's Nest, Blackbird, Black Thor, Black Label, Big Daddy, anticipated future community access roads).<br>■ Explain whether the noise assessment will consider increases in individual night-time noise events and their potential effect on sleep disturbance.<br>■ Provide detail to demonstrate that construction noise lasting longer than one year at any given location will be assessed. Provide a rationale for excluding noise-related complaints as an indicator of adverse health effects. Clarify how complaints resolution process will be considered in the Impact Statement.<br>■ Describe any applicable noise adjustments (e.g. for "quiet rural | ■ Section 9.4 details the assessment VCs and indicators. A description of how these correlate to effects on humans is also provided.<br>■ As noted in Section 9.4.1, if residual acoustic effects from the Project are predicted, a cumulative effects assessment will be carried out to assess the combined impact of the Project and other existing physical activities, as well as future physical activities that are certain and reasonably foreseeable. The cumulative effects assessment will consider other existing or future certain and reasonably foreseeable physical activities located within 5 km of Project receptors. Section 9.4 has been revised to include numerous indicators related to night-time operations and noise events.<br>■ Acoustic and Vibration Environment Study will consider community input and applicable policies (related to noise complaint resolution processes) where applicable and relevant. Further information will be provided in the IS / EA Report.<br>■ Section 9.4 details the federal, provincial and applicable guidance that will be used to assess all phases of the Project, including construction durations of less than one year and greater than one year. Section 9.4.4 describes the potential adjustments that may be applied according to federal / World Health Organization and provincial guidelines. | Section 9.4 |

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| | | ■ **Section 22**<br>– "The proponent must identify and assess the Project's cumulative effects using the approach described in the Agency's guidance documents related to cumulative environmental, health, social and economic effects…<br>– Finalizing the choice of valued components and the appropriate boundaries, including potential transboundary areas, to assess cumulative effects, is informed and confirmed as part of the tailoring process through consultation with the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities and other interested parties…<br>– The Impact Statement must: …<br>• assess the cumulative effects to each valued component selected by comparing the future scenarios with the Project and without the Project…" | | areas", time-of-day, tonal and/or impulsive noise) that are being considered and provide a description when they have been used or when it has been decided they are not applicable in a given scenario.<br>■ Provide details to demonstrate how the noise assessment will inform the decision whether to assess cumulative effects on human health due to noise. | ■ Section 9.3 of the updated study plan provides preliminary information on the interaction of effects and the interconnectedness of the VCs. Refer to the Human Health and Community Safety Study Plan for more information on human health effects. Further information will be provided in the IS / EA Report. | |
| **AC-10** | ■ **Section 6.2 Methods for Predicting Future Conditions**<br>– "If needed, noise due to Project construction involving stationary sources (e.g., aggregate extraction and refining) will be predicted in accordance…". | ■ **Section 14.1**<br>– "The Impact Statement must:…<br>• describe changes in ambient vibration and other sound levels resulting from the Project at potential receptor locations, including changes to the perception of non-anthropogenic sounds;…" | ■ The study plan does not provide information regarding the criteria on how to determine whether there is a need for predicting noise due to project construction involving stationary sources. | ■ Provide detail to explain the criteria or circumstances that will determine whether there is a need for predicting noise due to Project construction involving stationary sources. | ■ Section 9.4.2 describes the circumstances for assessing stationary noise due to construction activities and how provincial and federal guidelines will inform the assessment. | ■ Section 9.4 |
| **AC-11** | ■ **6.3 Magnitude of Effect Table 6-2: Acoustic Environment Magnitude Definition**<br>– "Definition of magnitude level: Increase of (1-3; 3-5; 5 or more) dB above baseline noise level Rationale: Industry references for human perception of changes in sound level." | ■ **Section 14.1**<br>– "The Impact Statement must: …<br>• describe changes in ambient vibration and other sound levels resulting from the Project at potential receptor locations, including changes to the perception of non-anthropogenic sounds;…" | ■ It is important to consider that people respond to sound characteristics that do not necessarily appreciably increase the sound level. Therefore, it is suggested that statements relating to perceptibility or whether changes in noise are noticeable based solely on decibel levels be avoided. Health Canada advises that such statements may give the public the impression that the sounds will not be heard, which may increase public complaints regarding noise during construction and operation. | ■ Broaden the scope of the proposed magnitude definition to include changes to the characteristics of the sound from baseline, in addition to the comparison of predicted and baseline noise levels. Other criteria that could contribute to magnitude could include changes in frequency, changes in sound modulation, increased impulsiveness, a shift in noise from the daytime to being more at night, a shift from quiet rural to traffic or construction-related noise, etc. | ■ Section 9.6 describes magnitude definitions in terms of the federal, provincial and other applicable criteria presented in Section 9. The VCs, indicators, and adjustments for sound character that will be used in the effects assessments are described in Section 9.2. | ■ Section 9.2<br>■ Section 9.6. |

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| **AC-12** | ■ **Section 7 Conformance with Federal and Provincial Guidance**<br>– "Federal and Provincial noise guidelines have been developed based on research into human response to noise exposure. The noise guidelines do not address whether these criteria are applicable to wildlife, nor do the guidelines provide separate criteria for wildlife assessment. We are not aware of any underwater noise or vibration thresholds that would be applicable for this project. As such, the Acoustic Environment Study Plan will assess acoustic impacts on human receptors only. Acoustic impacts and existing conditions related to underwater environments will not be determined or measured." | ■ **Section 8.1**<br>– "The Impact Statement must:…<br>• for the aquatic environment, provide current underwater soundscape and vibration descriptions of the study area and at the project site from various sources based on acoustic measurements. Provide information on vibration and sound sources, geographic extent and spatial and temporal variations within the water column;…"<br>■ **Section 13.1**<br>– "The Impact Statement must describe in detail the project's potential adverse and positive effects in relation to each phase of the Project (construction, operation, maintenance, suspension, decommissioning, and abandonment)…" | ■ It is unclear how the approach proposed in the study plan will meet the requirement of Section 8.1 of the Guidelines to provide a description of the current underwater soundscape and vibrations.<br>■ It is unclear if no acoustic effects is anticipated. This would include blasting of bedrock or vibrational effects from pile driving bridge piers. If any of these works, undertakings, or activities will occur in fish and fish habitat (below the high water mark), details on mitigation and guidelines to be followed are required. | ■ Describe an approach and methods to provide current underwater soundscape and vibration descriptions of the study area and at the project site from various sources that are based on acoustic measurements.<br>■ Provide information on how vibration and sound sources, geographic extent and spatial and temporal variations within the water column will be studied.<br>■ Provide details to clarify if acoustic effects from any works, undertakings, or activities will occur in fish and fish habitat. | ■ MFFN is not aware of any underwater noise or vibration thresholds that would be applicable for this project. As such, the Acoustic and Vibration Environment Study Plan will assess acoustic impacts on human receptors only. Acoustic impacts and existing conditions related to underwater environments will not be determined or measured.<br>■ Industry-standard mitigation, avoidance and protections measures will be implemented into the work plan, and includes those to avoid impacts to fish as a result of activities likely to produce underwater noise and vibration. This includes all DFO Fish and Fish Habitat Protection Program Measures to Protect Fish and Fish Habitat (general measures as well as applicable Measures from standard codes of practice) that apply, including those relating to vibration and noise. Further details can be found in the Fish and Fish Habitat Study Plan.<br>■ Section 9.3 of the updated study plan provides preliminary information on the interaction of effects and the interconnectedness of the VCs. Further information will be provided in the IS / EA Report. | ■ Section 9.3; Fish and Fish Habitat Study Plan |
| **AC-13** | ■ **Section 7 Conformance with Federal and Provincial Guidance**<br>– "The ambient noise monitoring results will serve as a baseline for the traffic noise assessment of the CAR. Road traffic is typically considered a source of ambient noise. Therefore, an increase in road traffic noise is considered an increase in ambient noise. This principle will be used to assess the operations of the CAR, including describing human perceptibility of the increase in noise. Ambient noise includes both anthropogenic and non-anthropogenic sounds. Ambient monitoring datasets include thousands of datapoints, and it is impractical to separate anthropogenic and non-anthropogenic events. As such, the Acoustic Environment Study will describe changes to the perception of sound with respect to the baseline ambient levels (e.g., anthropogenic + non-anthropogenic sounds)." | ■ **Section 13.1**<br>– "The Impact Statement must describe in detail the project's potential adverse and positive effects in relation to each phase of the Project (construction, operation, maintenance, suspension, decommissioning, and abandonment)…"<br>■ **Section 14.1**<br>– "The Impact Statement must:…<br>• describe changes in ambient vibration and other sound levels resulting from the Project at potential receptor locations, including changes to the perception of non-anthropogenic sounds;…" | ■ It is unclear if all phases of the Project will be included in the description of changes in ambient vibration and other sound levels resulting from the Project at potential receptor locations, as per Sections 13.1 and 14.1 of the Guidelines.<br>■ It is unclear what other ambient vibration and sound levels will be described, as the study plan only discusses road traffic. | ■ Provide detail to demonstrate that ambient vibration and other sound levels resulting from the Project will be described for each phase of the Project. | ■ Section 9.4 details how federal, provincial and other applicable guidance that will be used to assess all phases of the Project. | ■ Section 9.4 |

| Comment # / Ref # | DRAFT Study Plan Section | TISG Section | Comment / Context | Action Item | Final Response | Study Plan Reference |
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| **AC-14** | ■ **Section 7 Conformance with Federal and Provincial Guidance**<br>– "Acoustic Environment Study will describe noise source characteristics used in the noise impact assessment(s).<br>– Acoustic Environment Study will present hourly baseline results of the field monitoring program. Noise impact assessment will include a comparison of predicted noise levels and measured baseline levels.<br>– Acoustic Environment Study will include community input and applicable policies Acoustic Environment Study will gauge adverse noise impacts using accepted industry, Provincial, and Federal descriptors." | ■ **Section 14.1**<br>– "The Impact Statement must:…<br>• quantify sound levels at appropriate distances from any Project facility and/or activities and describe for each contributing source the timing (e.g., hours of night-time activities), number and duration of noise events and their sound characteristics, including frequency spectrum;<br>• provide the hourly distribution of baseline noise events at night in comparison to predicted individual noise events at night at each receptor location;<br>• consider the expectation of peace and quiet at receptors (e.g., in a quiet rural area or during Indigenous land use) and the applicable community-based policies concerning noise (e.g., complaints resolution processes);<br>• identify and justify the approach to determine the extent to which sound effects resulting from the Project are adverse and describe any changes in night-time light levels as a result of the Project;…" | ■ It is unclear how the approach proposed in the study plan will meet many of the requirements of Section 14.1 of the Guidelines.<br>■ Table 7.1 provides general statements that the requirements will be included in the Impact Statement. More detail is needed to determine how the requirements will be met. The Impact Statement must address all requirements outlined in the Guidelines and the study plan should demonstrate a clear approach to meet those requirements. | ■ Provide detail to demonstrate that the proposed approaches and methods will meet the requirements of the Guidelines, particularly Section 14.1. | ■ Section 9.2 details the assessment VCs and indicators. A description of how these correlate to effects on humans is also provided.<br>■ Section 9.4 has been revised to include numerous indicators related to night-time operations and noise events.<br>■ Acoustic and Vibration Environment Study will assess adverse noise impacts using accepted industry, provincial, and federal descriptors, including noise at night, if applicable. | ■ Section 9.2<br>■ Section 9.4<br>■ Section 11 |

# Draft Study Plan Comments – Provincial

| Comment # / Ref # | DRAFT Study Plan Section | Agency / Regulatory Body Comments Received From | Comment / Context | Action Item | Final Response | Study Plan Reference |
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| **1** | N/A | ■ MECP, Environmental Assessment Branch | ■ Please review EAB comments on the Wildlife, Ungulates, Vegetation and Groundwater work plans that may apply to this work plan. | | ■ We have reviewed the relevant comments and incorporated where appropriate. Please refer to the Comment Tables appended to the Wildlife, Ungulates and Vegetation Study Plans for specific responses. | ■ Wildlife Study Plan, Ungulates Study Plan, Vegetation Study Plan, Groundwater Study Plan |
| **1** | Page 2 | ■ MHSTCI (Tourism Policy and Research Branch) | ■ The Regional Study Area (RSA) is 2.5 kilometres on either side of the centreline of the two alternative routes under consideration.<br>■ Will all sensitive receptors be identified and mapped within the RSA? Will any receptors outside the RSA be mapped? | ■ Include mapping of all sensitive receptors located within the RSA, including tourism facilities (i.e. accommodations, boat caches if any, etc.). Exceptions could be made for sensitive Indigenous or other Cultural/Heritage features that would be at potential risk from identification.<br>■ Consider mapping of receptors outside the RSA based on feedback from stakeholders. We do not know the specific location of potential tourism receptors inside or outside the RSA but if a business in question is concerned about potential noise impacts, the proponent should work with businesses to address those concerns, including consideration as a sensitive receptor. | ■ Acoustic and Vibration Environment Study will identify noise sensitive receptors within the projects study areas. All information obtained from the interested stakeholders and Indigenous groups will be recorded and considered in the effects assessment, where appropriate. | ■ Section 9.4.4 |

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