

Appendix D

Valued Components Preliminary Spatial Boundaries



The EAR/IS will include a description of the spatial boundaries to be applied to each Valued Component (VC), including maps, for the Project's effects assessment. A comparative evaluation of alternative methods of carrying out the Project will be undertaken, and the sum of the preferred methods will constitute the Project. Once the preferred methods (i.e., the Project) have been identified, an effects assessment will be completed for the Project. **Section 6.2.1.5** of the Terms of Reference describes the considerations for the selection of spatial boundaries, including Local Study Areas (LSAs) and Regional Study Areas (RSAs). This appendix presents preliminary spatial boundaries for each VC and provides rationale for the selection of these boundaries. The spatial boundaries to be used in the EAR/IS will be refined and validated through input from Indigenous groups, federal and provincial regulators, the public, and other interested parties. Spatial boundaries will be defined taking into account the appropriate scale and spatial extent of potential effects of the Project on Aboriginal and Treaty Rights and Interests. Indigenous Knowledge/Indigenous Land and Resource Use (IK/ILRU) and input from Indigenous communities will be important for the determination of spatial boundaries.

D.1 Aboriginal and Treaty Rights and Interests

D.1.1 Indigenous Use of Land and Resources

Local Study Area: The LSA corresponds to the outermost boundaries for the combined LSAs for the Air Quality, Surface Water, Groundwater, Fish and Fish Habitat, Wildlife and Wildlife Habitat (Moose), Plant and Vegetation Communities, and Archaeological and Cultural Heritage VCs, given that these VCs may be relied on (i.e., surface water, fish, vegetation, moose) or considered to influence (i.e., air quality) Indigenous culture and/or land and resource use.

Regional Study Area: The RSA corresponds to the outermost boundaries for the combined RSAs for the Air Quality, Surface Water, Fish and Fish Habitat, Wildlife and Wildlife Habitat (Moose), and Plant and Vegetation Communities VCs, given that these components may be relied on by Indigenous peoples for cultural and land and resource purposes.

The preliminary spatial boundaries for Aboriginal and Treaty Rights and Interests assessment are shown in **Figure D-1**.

D.1.2 Cultural Continuity and Well-being

The preliminary spatial boundaries for the Cultural Continuity and Well-being VC assessment are the same as for the Indigenous Use of Land and Resources VC assessment as shown in **Figure D-1**.

D.2 Physical Environment

D.2.1 Air Quality

Local Study Area: The LSA comprises the Project Footprint plus a 5 km buffer from the boundary of the Project Footprint. The Project Footprint is not yet known but it will be located within the 2 km wide preferred corridor. The LSA has been selected to align with the Ontario MECP recommendations for local dispersion modelling, which is that effects be assessed up to 5 km from a source (MECP, 2019).

Regional Study Area: The RSA is the same as the LSA, as Project-related effects on Air Quality are not expected beyond the LSA.



D.2.2 Greenhouse Gas Emissions

Local Study Area: The LSA comprises the Project Footprint, as all emission sources will be contained within the Project Footprint. The Project Footprint is not yet known, but will be located within the 2 km wide preferred corridor. The assessment will include only GHG emission sources within the Project Footprint.

Regional Study Area: The RSA is currently being developed in consultation with the regulators and will be included in the applicable study plan.

D.2.3 Noise

Local Study Area: The LSA comprises the Project Footprint plus a 1.5 km buffer from the boundary of the Project Footprint for construction and 600 m for operation. The Project Footprint is not yet known but it will be located within the 2 km wide preferred corridor.

The LSA has been selected to align with the Ontario Ministry of Transportation Environmental Guide for Noise (MTO, 2006). Transportation corridors with relatively low traffic volumes result in noise impacts that are more localized to the right-of-way during operation, dissipating relatively rapidly over the absorptive surfaces surrounding the Project. For the construction phase, a larger 1.5 km area is proposed. The construction phase is expected to have higher noise levels over shorter periods (e.g., impulsive noise) relative to operation.

Regional Study Area: The RSA is the same as the LSA, as Project-related effects on Noise are not anticipated beyond the LSA.

D.2.4 Groundwater

Local Study Area: The LSA extends approximately 1 km from the boundary of the preferred corridor. The MECP guidance document "Hydrogeological Studies in Support of Category 3 Permit to Take Water Applications" recommends a minimum buffer of 500 m to assess potential effects to groundwater users. However, the LSA was extended to 1 km to capture additional zone of influence from potential project effects to groundwater level, flow direction, and water quality.

Regional Study Area: The RSA is the same as the LSA, as Project-related effects on groundwater are not anticipated beyond the LSA.

The preliminary spatial boundaries for the Groundwater VC assessment are shown in Figure D-2.

D.2.5 Surface Water

Local Study Area: The LSA encompasses the quaternary watersheds crossed by the preferred corridor.

Regional Study Area: The RSA includes tertiary sub-watersheds traversed by the LSA. The RSA includes surface water outside the LSA where direct effects are unlikely but broad, indirect effects have the potential to occur.

The preliminary spatial boundaries for the Surface Water VC assessment are shown in Figure D-3.



D.2.6 Geology, Terrain and Soils

Local Study Area: The LSA is equal to the 2 km wide preferred corridor.

Regional Study Area: The RSA extends 5 km from the boundary of the LSA.

The preliminary spatial boundaries for the Geology, Terrain and Soils VC assessment are shown in Figure D-4.

D.2.7 Visual Environment

Local Study Area: The LSA extends 2 km from the boundary of the Project Footprint. The Project Footprint is not yet known but will be located within the 2 km width preferred corridor. The LSA provides for a localized visual assessment, given the remote wilderness settings of the Project. Viewers potentially observe a distinguishable level of detail and contrast in the LSA.

Regional Study Area: The RSA extends 8 km from the boundary of the LSA (i.e., 8 km from the boundary of the Project Footprint). The RSA was established as this because visibility beyond 8 km dissipates and is significantly reduced due to flat topography and forested landscape. Viewers potentially observe minimal distinguishable level of detail and contrast in the RSA.

D.3 Biological Environment

The project straddles the border of the Hudson Bay Lowlands and Ontario Shield Ecozones. The project is also contained entirely within the James Bayand Big Trout Lake Ecoregions. All LSA and RSAs of the biological environment fall within these two Ecozones and Ecoregions.

D.3.1 Fish and Fish Habitat

Local Study Area: The LSA extends 1.25 km on either side of centreline of the preferred corridor. The LSA includes water features with the potential for fish and fish habitat within the preferred corridor and within 1.25 km of the preferred corridor centerline where there is potential for direct effects (e.g., sedimentation, accidental releases).

Regional Study Area: The RSA includes tertiary sub-watersheds traversed by the LSA. The RSA includes fish habitat outside the LSA where direct effects are unlikely but broad, indirect effects have the potential to occur.

The preliminary spatial boundaries for the Fish and Fish Habitat VC assessment are shown in Figure D-5.

D.3.2 Wildlife and Wildlife Habitat

Local Study Area: The LSA for most wildlife and wildlife habitat, including Moose (*Alces alces*), extends approximately 1 km from the boundary of the preferred corridor.

Regional Study Area: The RSA for most wildlife and wildlife habitat extends approximately 5 km from the boundary of the LSA. For Moose, the RSA is proposed to extend 20 km from the wildlife and wildlife habitat LSA.

The preliminary spatial boundaries for the Wildlife and Wildlife Habitat VC assessment are shown in Figures D-6 and D-7.



D.3.3 Birds and Bird Habitat

Local Study Area: The LSA extends approximately 3 km from the boundary of the preferred corridor.

Regional Study Area: The RSA extends approximately 11 km from the boundary of the LSA.

The preliminary spatial boundaries for the Birds and Bird Habitat VC assessment are shown in Figure D-8.

D.3.4 Plants and Vegetation Communities

Local Study Area: The LSA extends approximately 1 km from the boundary of the preferred corridor.

Regional Study Area: The RSA extends approximately 5 km from the LSA boundary.

The preliminary spatial boundaries for the Plants and Vegetation Communities VC assessment are shown in **Figure D-9**.

D.3.5 Species at Risk

Local Study Area: The LSA for Caribou (*Rangifer tarandus*) and Wolverine (*Gulo gulo*) extends 10 km beyond the boundary of the preferred corridor. For bird SAR, the LSA is the same (3 km buffer from preferred corridor) as for non-SAR birds. For bat SAR, the LSA is the same (1 km buffer from the preferred corridor) as for non-SAR bats. For fish SAR, the LSA is the same (1.25 km buffer from the preferred corridor) as for non-SAR fish.

Regional Study Area: For Caribou, the RSA encompasses the entire Missisa and Ozhinski Ranges for the species in Ontario. For Wolverine, the RSA is proposed to extend 75 km from the Wolverine LSA boundary, for a total of 85 km from the preferred corridor. RSA calculated using maximum home range size for male Wolverines of 4109 km² in Ontario (based on Dawson et al. [2010]). Under the assumption of a circular home range of 4000 km² in area, the approximate diameter a buffer of 75 km surrounding the LSA will allow for a Wolverine home range on either side of the preferred corridor. For bird SAR, the RSA is the same (11 km buffer from boundary of the LSA) as for non-SAR birds. For bat SAR, the RSA is the same (5km buffer from the preferred corridor) as for non-SAR bats. For fish SAR, the RSA is the same (tertiary sub-watersheds traversed by the LSA) as for non-SAR fish.

The preliminary spatial boundaries for the Species At Risk VC assessment are shown in **Figures D-10**, **D-11**, and **D-12**.

D.4 Socio-economic Environment

D.4.1 Regional and Local Economy

Local Study Area: The LSA includes the communities that have the highest potential to be both positively and negatively affected by the Project based close proximity to the proposed Project and its subsequent connection to the all-season road network. The economy in these communities may be more likely to change due to potential employment and business opportunities facilitated by road construction and economic activity within the Ring of Fire mineral deposit area, as well as greater economic activity in the area with the transport of goods, services, and resources. This includes the communities of:

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- Webequie First Nation
- Neskantaga First Nation
- Nibinamik First Nation
- Marten Falls First Nation
- Eabametoong First Nation

Regional Study Area: The RSA encompasses the area outside of the LSA used to measure broader-scale existing economic conditions and provide regional context for the Regional and Local Economy VC. This area includes 17 Indigenous communities and groups, and 5 surrounding municipalities as following:

Indigenous communities:

- Animbiigoo Zaagi'igan Anishinaabek
- Aroland First Nation
- Attawapiskat First Nation
- Constance Lake First Nation
- Fort Albany First Nation
- > Ginoogaming First Nation
- Xasabonika Lake First Nation
- Xashechewan First Nation
- Xingfisher Lake First Nation
- Xitchenuhmaykoosib Inninuwug
- Long Lake #58 First Nation
- Métis Nation of Ontario Region 2
- Red Sky Independent Métis Nation
- Wapekeka First Nation
- Wawakapewin First Nation
- Weenusk (Peawanuck) First Nation
- Wunnumin Lake First Nation

Municipalities:

- City of Thunder Bay
- City of Timmins
- Municipality of Greenstone
- Municipality of Sioux Lookout
- Township of Pickle Lake

The preliminary spatial boundaries for the Regional and Local Economy VC assessment are shown in Figure D-13.

D.4.2 Community Services and Infrastructure

The preliminary spatial boundaries for the Community Services and Infrastructure VC assessment are the same as for the Regional and Local Economy VC assessment and are shown in **Figure D-13**.



D.4.3 Land Use and Recreation

Local Study Area: The LSA will include the Indigenous communities who have the highest potential to be affected by the Project based close proximity to the proposed Project and its subsequent connection to the all-season road network. The LSA extends 1 km from the boundary of the preferred corridor.

Regional Study Area: The RSA encompasses the area outside of the LSA and will be used to assess broader-scale socio-economic conditions and Project-related effects and provide regional context for the Land Use and Recreation VC. The RSA extends 30 km from the boundary of the LSA.

D.4.4 Community Safety

The preliminary spatial boundaries for the Community Safety VC assessment are the same as for the Regional and Local Economy VC assessment and are shown in **Figure D-13**.

D.5 Cultural Heritage Resources

Local Study Area: The LSA extends 25 m from the preferred corridor, where cultural heritage resources could be affected by ground disturbance.

Regional Study Area: The RSA extends 250 m from the preferred corridor. Cultural heritage resources in this area could be indirectly affected is disruption isolation when visually set apart from the former setting and the introduction of physical, visual, audible or atmospheric elements not in keeping the character or setting.

The preliminary spatial boundaries for the Cultural Heritage Resources assessment are shown in **Figure D-14**.

D.6 Human Health

Local Study Area: The LSA is the maximum boundary of the LSAs for the Air Quality, Noise, and Surface Water VCs. Changes to the air quality, noise levels and surface water quality may have an effect on the health of individuals near the Project.

Regional Study Area: The RSA is the maximum boundary of the RSAs for the Air Quality, Noise, and Surface Water VCs. Changes to air quality, noise levels and surface water quality may have an effect on the health of individuals near the Project.

D.7 References

Dawson, N., Magoun, A., Bowman, J., and Ray, J. 2010. Wolverine, Gulo gulo, home range size and denning habitat in lowland boreal forest in Ontario. Canadian Field-Naturalist 124(2): 139-1344.

Ministry of Environment, Conservation and Parks (MECP). 2019. Preparing and Environmental Assessments in Ontario. July 18, 2019. Available: https://www.ontario.ca/document/preparing-and-reviewing-environmental-assessments-ontario-0

Ministry of Transportation (MTO). 2006. Environmental Guide for Noise. Proposed Revision 2021. Available: https://prod-environmental-registry.s3.amazonaws.com/2021-08/Environmental%20Guide%20for%20Noise%202021%20%28Aug%202021%29.pdf

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