

# Appendix A

## Metrics to Help Identify a Preferred Route – Tables



## Segment 1 – Ogoki Crossing

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Aboriginal and Treaty Rights and Interests</b>						
Indigenous Current Use of Lands and Resources for Traditional Purposes	<ul style="list-style-type: none"> <li>Loss of or change to sites and areas used for traditional activities (hunting, trapping, fishing, berry picking, plant harvesting).</li> </ul>	<ul style="list-style-type: none"> <li>Overlap / intersection of Project footprint with harvesting sites and areas reported by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Continue to engage with Indigenous communities to identify harvesting sites and areas.</li> <li>Avoid, where possible, harvesting sites and areas identified by communities.</li> <li>Utilize signage (Indigenous and English language) during construction to identify harvesting sites and areas in the vicinity of the Project that must be avoided.</li> <li>Where avoidance is not possible, engage with potentially affected communities to discuss appropriate mitigation related to sites and areas used for harvesting.</li> <li>Inform Indigenous communities and trappers who use trapline GE157 of Project construction activities, schedules, and locations.</li> </ul>	<ul style="list-style-type: none"> <li>1 Marten Falls First Nation (MFFN) trapping area intersected by the current alignment and associated aggregate areas.</li> <li>6 MFFN harvesting locations reported within the Study Area (2.5 km): <ul style="list-style-type: none"> <li>5 trapping locations; and</li> <li>1 fishing location.</li> </ul> </li> <li>13 MFFN harvesting locations reported within the Local Study Area (LSA; 5 km): <ul style="list-style-type: none"> <li>12 trapping locations; and</li> <li>1 fishing location.</li> </ul> </li> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternative 1 is the most preferred route from the perspective of animal harvesting; no preference was indicated from a fish harvesting or plant harvesting perspective.</li> <li>Lowest net effects anticipated given fewer intersections with reported harvesting locations, and based on MFFN's preference from an animal harvesting perspective.</li> </ul>	<ul style="list-style-type: none"> <li>4 Indigenous harvesting locations intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>2 MFFN trapping areas;</li> <li>1 Indigenous fishing area reported by a MFFN member during the Consultation Program; and</li> <li>an area reported by a MFFN member to be used by Aroland First Nation for traditional purposes.</li> </ul> </li> <li>9 Indigenous harvesting locations reported within the Study Area (2.5 km): <ul style="list-style-type: none"> <li>7 hunting and / or trapping locations; and</li> <li>2 fishing locations.</li> </ul> </li> <li>17 Indigenous harvesting locations reported within the LSA (5 km): <ul style="list-style-type: none"> <li>15 hunting and / or trapping locations; and</li> <li>2 fishing locations.</li> </ul> </li> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternatives 4 East and 4 West are the least preferred routes from the perspective of animal harvesting; no preference was indicated from a fish harvesting or plant harvesting perspective.</li> <li>The alternative traverses an area reported by a MFFN member that may be used by Aroland First Nation for traditional purposes.</li> <li>Highest net effects anticipated given the number of interactions with reported harvesting locations, and based on MFFN's preference from animal harvesting perspective.</li> </ul>	<ul style="list-style-type: none"> <li>4 Indigenous harvesting locations intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>2 MFFN trapping areas;</li> <li>1 Indigenous fishing area reported by a MFFN member during the Consultation Program; and</li> <li>an area reported by a MFFN member to be used by Aroland First Nation for traditional purposes.</li> </ul> </li> <li>9 Indigenous harvesting locations reported within the Study Area (2.5 km): <ul style="list-style-type: none"> <li>7 hunting and / or trapping locations; and</li> <li>2 fishing locations.</li> </ul> </li> <li>17 Indigenous harvesting locations reported within the LSA (5 km): <ul style="list-style-type: none"> <li>15 hunting and / or trapping locations; and</li> <li>2 fishing locations.</li> </ul> </li> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternatives 4 East and 4 West are the least preferred routes from the perspective of animal harvesting; no preference was indicated from a fish harvesting or plant harvesting perspective.</li> <li>The alternative traverses an area reported by a MFFN member that may be used by Aroland First Nation for traditional purposes.</li> <li>Highest net effects anticipated given the number of interactions with reported harvesting locations, and based on MFFN's preference from animal harvesting perspective.</li> </ul>
				<b>Indicator Summary</b>	Alternative 1 is the most preferred route because it has the lowest intersection with reported Indigenous harvesting sites, and it is the most preferred alternative identified by MFFN from an animal harvest perspective. As a result, this alternative is anticipated to have the lowest net effect on sites and areas used for traditional activities.	<b>Most Preferred</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West	
<b>Aboriginal and Treaty Rights and Interests</b>							
	<ul style="list-style-type: none"> <li>Changes in the availability of lands and resources (e.g., wildlife, fish, vegetation) for traditional harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in land availability resulting from overall road / clearing area of each route.</li> <li>Changes to ungulate habitat availability and distribution.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Implement appropriate mitigation measures for wildlife, fish, and vegetation resources that are used for traditional purposes – refer to respective valued components (VCs) for mitigation measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>Develop an Environmental Protection Plan with potentially affected Indigenous communities that include best management practices for wildlife, fish, and vegetation protection and mitigation based on Indigenous Knowledge.</li> <li>Develop and implement an Indigenous-led environmental monitoring program that utilizes Indigenous Knowledge to continue to assess changes in availability or quantity of resources so that mitigation measure can be employed more effectively and in “real time” during the construction and operation of the road.</li> <li>Involve local Indigenous communities in the development of access management measures or plans, including the development of policies for non-Indigenous Project personnel while on shift or at temporary construction camps with respect to any harvesting activities.</li> <li>Work with other governing bodies to develop regulations that minimize non-local access to and harvesting pressure on local wildlife, fish, and vegetation.</li> <li>Use Indigenous land users (e.g., hunters and trappers) to monitor the Project area to support the enforcement of access management measures.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is the most preferred as it results in the least amount of land clearing (1,509.01 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative results is moderately preferred as it results in a moderate amount of land clearing (3,574.21 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is the least preferred as it results in the greatest amount of land clearing (5,508.94 ha).</li> </ul>	
					<b>Most Preferred</b>	<b>Moderately Preferred</b>	<b>Least Preferred</b>
				<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 503 ha of high suitability moose habitat within the Project Development Area (PDA), and 2,490 ha of highly suitable moose habitat is located within 500 m of the current alignment and may be indirectly disturbed by noise and dust.</li> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat Description (GHD) winter use areas, nursery areas or travel corridors for caribou.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 410 ha of high suitability moose habitat within the PDA, and 1,853 ha of highly suitable moose habitat is located within 500 m of the current alignment and may be indirectly disturbed by noise and dust.</li> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat travel corridors for caribou; however, it is anticipated to disturb 215 ha of known and potential winter use and 21 ha of known and potential nursery areas within the PDA, and may indirectly disturb 1,642 ha of known and potential winter use area habitat and 206 ha of known and potential nursery area habitat within 500 m of the current alignment from noise and dust.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 820 ha of high suitability moose habitat within the PDA, and 2,439 ha of highly suitable moose habitat is located within 500 m of the current alignment and may be indirectly disturbed by noise and dust.</li> <li>This alternative is anticipated to disturb known and potential Category 1 General Caribou Habitat, including 815 ha of winter use areas, 204 ha of nursery areas, and 739 ha of travel corridors in the PDA, and may indirectly disturb 2,526 ha of known and potential winter use area habitat, 801 ha of known and potential nursery area habitat, and 585 ha of known and potential travel corridor habitat within 500 m of the current alignment from noise and dust.</li> </ul>	
				<ul style="list-style-type: none"> <li>Alternative 1 and Alternative 4 East are most preferred from the perspective of availability of moose and caribou, both of which are harvested by MFFN and other Indigenous communities, as they are anticipated to have the lowest net effects on caribou and moose compared to Alternative 4 West.</li> <li>While Alternative 1 results in slightly higher net effects on moose habitat compared to Alternative 4 East, this difference may be considered negligible when also factoring impacts on caribou, which are also harvested by MFFN and other Indigenous communities in the region.</li> </ul>			<ul style="list-style-type: none"> <li>Alternative 4 West is least preferred, as it is anticipated that it would result in the highest net effects on moose and caribou.</li> </ul>
				<b>Most Preferred</b>	<b>Least Preferred</b>		
				<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred, as it is anticipated to result in the least direct loss of moderate / high-quality American marten habitat (1,300.13 ha), and it has the lowest wolverine relative abundance (0.29) and the fewest number of observations of female wolverine and wolverines of unknown sex.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 4 East is moderately preferred, as it is anticipated to result in a moderate direct loss of moderate / high-quality American marten habitat (3,233.57 ha), and it has a moderate number of observations of female wolverine and wolverines of unknown sex.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 4 West is the least preferred, as it is anticipated to result in the greatest direct loss of moderate / high-quality American marten habitat (4,763.27), and it has the highest wolverine relative abundance (0.50) and the largest number of observations of female wolverine and wolverines of unknown sex.</li> </ul>	
				<b>Most Preferred</b>	<b>Moderately Preferred</b>	<b>Least Preferred</b>	
				<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 5 suitable habitat features (60.7 ha).</li> <li>Alternative 1 is the most preferred, as it results in the least direct loss of suitable habitat features for waterfowl (e.g., stopover sites).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4 suitable habitat features (137.3 ha).</li> <li>Alternative 4 East is moderately preferred from a changes to habitat availability and distribution, and species presence abundance for waterfowl perspective, as it results in the moderate direct loss of suitable habitat features for waterfowl.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4 suitable habitat features (141.1 ha).</li> <li>Alternative 4 West is the least preferred, as it results in the greatest direct loss of suitable habitat features for waterfowl.</li> </ul>	
				<b>Most Preferred</b>	<b>Moderately Preferred</b>	<b>Least Preferred</b>	

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Aboriginal and Treaty Rights and Interests</b>						
		<ul style="list-style-type: none"> <li>Changes to habitat quantity, quantity, distribution, and connectivity and species survival and reproduction for fish that are harvested for traditional purposes.</li> </ul>		<ul style="list-style-type: none"> <li>Alternative 1 and Alternative 4 East have the least number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions without loss of function or individuals are predicted.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 1 and Alternative 4 East have the least number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions without loss of function or individuals are predicted.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 4 West has the greatest number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions without loss of function or individuals are predicted.</li> </ul>
		<ul style="list-style-type: none"> <li>Changes to the presence and accessibility to traditional use plants.</li> </ul>		<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Alternative 1 is the most preferred, as it results in the least direct loss of highly suitable and highly accessible habitats for traditional use plants (245.74 ha).</li> </ul>	<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Alternative 4 East is moderately preferred, as it disturbs fewer upland ecosite types than Alternative 4 West but a greatest number of ecosite types than Alternative 1.</li> </ul>	<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Alternative 4 West is the least preferred, as it results in the greatest direct loss of highly suitable and highly accessible habitats for traditional use plants (4,244.53 ha).</li> </ul>
		<ul style="list-style-type: none"> <li>Change to access to land utilized for recreation and / or tourism (increased access and pressure on resources).</li> </ul>		<p><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>All three alternatives provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route are not considered to have more recreation value than other route segments. No information has been shared by MFFN or stakeholders to suggest otherwise.</li> </ul>	<p><b>Moderately Preferred</b></p> <ul style="list-style-type: none"> <li>All three alternatives provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route are not considered to have more recreation value than other route segments. No information has been shared by MFFN or stakeholders to suggest otherwise.</li> </ul>	<p><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>All three alternatives provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route are not considered to have more recreation value than other route segments. No information has been shared by MFFN or stakeholders to suggest otherwise.</li> </ul>
		<ul style="list-style-type: none"> <li>Indigenous Knowledge on important habitat for fish and wildlife that may need to be avoided.</li> </ul>		<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Alternative 1 is the most preferred as it does not intersect with any reported fish and wildlife use areas, as noted in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project.</li> </ul>	<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Alternatives 4 East and 4 West are the least preferred, as they intersect with an important fish habitat and feeding area that should not be disturbed, as noted in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project.</li> </ul>	<p><b>No discernable difference</b></p>
				<p><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>Alternative 1 is the most preferred route because it would result in the least amount of land clearing, and it is anticipated to have the lowest net effects on the resources used for traditional purposes. As a result, this alternative is anticipated to have the lowest net effect on the availability of lands and resources for traditional harvesting.</li> </ul>	<p><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>Alternative 4 East is the moderately preferred route because it would result in a moderate amount of land clearing, and it is anticipated to have moderate net effects on the resources used for traditional purposes. As a result, this alternative is anticipated to have moderate net effect on the availability of lands and resources for traditional harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Alternative 4 West is the least preferred route because it would result in the greatest amount of land clearing, and it is anticipated to have the highest net effects on the resources used for traditional purposes. As a result, this alternative is anticipated to have the highest net effect on the availability of lands and resources for traditional harvesting.</li> </ul>
			<b>Indicator Summary</b>			

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West	
<b>Aboriginal and Treaty Rights and Interests</b>							
	<ul style="list-style-type: none"> <li>Changes in quality of resources for traditional purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for changes in the quality of country food.</li> </ul>	<ul style="list-style-type: none"> <li>Community input into alignment routing, component siting and road design to avoid important habitats for resources that serve as country foods, to the extent feasible. Mitigation measures during construction to prevent and minimize the potential impacts of spills and malfunctions.</li> <li>Develop a response plan in case of spills or other environmental emergencies along the road.</li> <li>Develop and implement an Indigenous-led environmental monitoring program that utilizes Indigenous Knowledge to continue to assess potential changes in the quality of resources.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	
		Potential for changes in the perception of quality of country foods		<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>	
				<ul style="list-style-type: none"> <li>Information on how the perception of the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the perception of the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the perception of the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>	
	<b>Indicator Summary</b>			There is no preference between the alternatives as there is currently no information available for this indicator. This will be assessed as part of the overall Project impact assessment, and will be informed by inputs from Indigenous communities, where provided.			
	<ul style="list-style-type: none"> <li>Changes in access to sites and areas used for traditional activities.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for any temporary or permanent Project components to impede access to sites and areas used for harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> <li>Involve local Indigenous communities in the development of access management measures or plans.</li> <li>Create temporary detours for snowmobiles and ATVs during construction. Use signage in English and Indigenous languages for any temporary detour routes.</li> <li>Provide community updates regarding location and timing of construction activities.</li> <li>Provide access ramps to travel routes bisected by the road, where required.</li> <li>Continued engagement with Indigenous communities to identify any access concerns during construction and operation.</li> </ul>	<ul style="list-style-type: none"> <li>Current alignment intersects with 3 reported MFFN travel routes – 2 walking / trapping trails and 1 portage; however, there is no information on whether these travel routes continue to be used or were used in the past.</li> <li>5 MFFN travel routes reported within the Study Area (2.5 km).</li> <li>9 MFFN travel routes reported within the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>No travel routes reported in the LSA.</li> </ul>	<ul style="list-style-type: none"> <li>No travel routes reported in the LSA.</li> </ul>	
							<b>No discernable difference</b>
		<ul style="list-style-type: none"> <li>Changes in waterway navigability.</li> </ul>			<ul style="list-style-type: none"> <li>All route options cross a similar number of waterbodies (17-18).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>All route options cross a similar number of waterbodies (17-18).</li> <li>The development of bridges over watercourses could negatively affect navigation. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>All route options cross a similar number of waterbodies (17-18).</li> <li>The development of bridges over watercourses could negatively affect navigation. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>
					<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>
	<b>Indicator Summary</b>			There is no preference among the alternatives as there is no discernable difference among them for this indicator as minimal net effects are anticipated with mitigation measures.			

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West	
<b>Aboriginal and Treaty Rights and Interests</b>							
Cultural Continuity and Well-being (ability to practice and transmit cultural traditions)	Loss of or change to culturally important sites and areas and their access.	<ul style="list-style-type: none"> <li>Comparison / intersection of Project footprint with cultural, spiritual, and / or historical sites and areas reported by Indigenous communities (habitation, burial, ceremonial, sacred, meeting, teaching, place name).</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Continue to engage with Indigenous communities to identify culturally important sites and areas and associated access.</li> <li>Complete any necessary or appropriate archaeological and cultural heritage assessments.</li> <li>Avoid, where possible, culturally important sites and areas identified by communities.</li> <li>Utilize signage (Indigenous and English language) during construction to identify sites and areas in the vicinity of the Project that must be avoided.</li> <li>Where avoidance is not possible, engage with potentially affected communities to discuss appropriate mitigation related to culturally important sites and areas (e.g., Cultural Heritage Impact Assessment, community-specific chance finds protocols).</li> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> <li>Involve local Indigenous communities in the development of access management measures or plans.</li> <li>Create temporary detours for snowmobiles and ATVs during construction. Use signage in English and Indigenous languages for any temporary detour routes.</li> <li>Provide community updates regarding location and timing of construction activities.</li> <li>Provide access ramps to travel routes bisected by the road, where required.</li> <li>Continued engagement with Indigenous communities to identify any access concerns during construction and operation.</li> </ul>	<ul style="list-style-type: none"> <li>No reported Indigenous cultural, spiritual, and / or historical sites or areas are intersected by the current alignment and associated aggregate areas.</li> <li>1 MFFN burial site reported just outside the eastern boundary of the Study Area (2.5 km).</li> <li>12 MFFN cultural, spiritual, and / or historical locations reported within the LSA (5 km).</li> <li>Lowest potential for net effects given that there are no intersections with reported Indigenous cultural, spiritual, and / or historical sites or areas, and there are no burial sites within the Study Area (within 2.5 km of the current alignment).</li> </ul>	<ul style="list-style-type: none"> <li>An Aroland First Nation member reported a burial site in the area of the proposed Ogoki River crossing – potential intersection with the current route alignment.</li> <li>The alternative traverses an area reported by a MFFN member that may be used by Aroland First Nation for traditional purposes – potential for culturally important sites to be present, needs to be confirmed with Aroland First Nation.</li> <li>This alternative traverses a place name site (Patience Lake).</li> <li>1 MFFN burial site within the Study Area (2.5 km), in the area of the proposed Ogoki River crossing.</li> <li>3 MFFN cultural, spiritual, and / or historical locations reported within the Study Area (2.5 km).</li> <li>5 MFFN cultural, spiritual, and / or historical locations reported within the LSA (5 km).</li> <li>Highest potential for net effects given the potential intersection with an Aroland First Nation burial site, the presence of a reported MFFN burial site in the area of the proposed Ogoki River crossing, and given that the alternative traverses an area that may be used by Aroland First Nation for traditional purposes, with potential for the presence of additional sites of cultural importance to Aroland First Nation the community.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative traverses an area reported by a MFFN member that may be used by Aroland First Nation for traditional purposes – potential for culturally important sites to be present, needs to be confirmed with Aroland First Nation.</li> <li>This alternative traverses a place name site (Patience Lake).</li> <li>1 MFFN burial site within the Study Area (2.5 km), in the area of the proposed Ogoki River crossing.</li> <li>3 MFFN cultural, spiritual, and / or historical locations reported within the Study Area (2.5 km).</li> <li>5 MFFN cultural, spiritual, and / or historical locations reported within the LSA (5 km).</li> <li>Moderate potential for net effects given the presence of a reported MFFN burial site in the area of the proposed Ogoki River crossing and given that the alternative traverses an area that may be used by Aroland First Nation for traditional purposes, with potential for the presence of additional sites of cultural importance to Aroland First Nation the community.</li> </ul>	
				Changes in previously identified archaeological sites.	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>
				Potential for any temporary or permanent Project components to impede access to culturally important sites and areas.	<ul style="list-style-type: none"> <li><b>No discernable difference</b></li> </ul>	<ul style="list-style-type: none"> <li><b>No discernable difference</b></li> </ul>	<ul style="list-style-type: none"> <li><b>No discernable difference</b></li> </ul>
			<ul style="list-style-type: none"> <li>Current alignment intersects with 3 reported MFFN travel routes – 2 walking / trapping trails and 1 portage; however, there is no information on whether these travel routes continue to be used or were used in the past.</li> <li>5 MFFN travel routes reported within the Study Area (2.5 km).</li> <li>9 MFFN travel routes reported within the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety</li> </ul>	<ul style="list-style-type: none"> <li>No travel routes reported in the LSA.</li> </ul>	<ul style="list-style-type: none"> <li>No travel routes reported in the LSA.</li> </ul>		

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Aboriginal and Treaty Rights and Interests</b>						
				<p>reasons, the users / communities will be advised of this in advance.</p> <ul style="list-style-type: none"> <li>Minimal effects anticipated with the application of mitigation measures.</li> </ul>		
		<ul style="list-style-type: none"> <li>Changes in waterway navigability.</li> </ul>		<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>All segments cross a similar number of waterbodies (17-18).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>	<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>All segments cross a similar number of waterbodies (17-18).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>	<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>All segments cross a similar number of waterbodies (17-18).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>
				<p><b>No discernable difference</b></p>	<p><b>No discernable difference</b></p>	<p><b>No discernable difference</b></p>
			<p><b>Indicator Summary</b></p>	<p>Alternative 1 is the most preferred route because there are no intersections with reported Indigenous cultural, spiritual, and / or historical sites or areas and there are no burial sites reported within the Study Area (within 2.5 km of the current alignment), therefore it has the lowest potential for net effects on culturally important sites and areas.</p>	<p>Alternative 4 East is the least preferred route because it has the highest potential for net effects on culturally important sites and areas given the potential intersection with an Aroland First Nation burial site, the presence of a reported MFFN and Aroland First Nation burial sites in the area of the proposed Ogoki River crossing, and given that the alternative traverses an area that may be used by Aroland First Nation for traditional purposes, with potential for the presence of additional sites of cultural importance to Aroland First Nation.</p>	<p>Alternative 4 West is the moderately preferred route given the presence of a reported MFFN burial site in the area of the proposed Ogoki River crossing and given that the alternative traverses an area that may be used by Aroland First Nation for traditional purposes, with potential for the presence of additional sites of cultural importance to Aroland First Nation the community.</p>
	<ul style="list-style-type: none"> <li>Changes in the sufficiency of lands and resources for cultural practices.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for exceedances in any thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures identified to avoid or minimize changes in quantity and quality of lands and resources for traditional purposes will also serve as mitigation measures for this indicator.</li> <li>Where thresholds are identified, engage with Indigenous communities to discuss appropriate mitigation measures to be included in the Environmental Protection Plan.</li> </ul>	<ul style="list-style-type: none"> <li>There is currently no information on thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> <li>This will be assessed as part of the overall Project impact assessment, where information is provided by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>There is currently no information on thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> <li>This will be assessed as part of the overall Project impact assessment, where information is provided by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>There is currently no information on thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> <li>This will be assessed as part of the overall Project impact assessment, where information is provided by Indigenous communities.</li> </ul>
				<p><b>No discernable difference</b></p>	<p><b>No discernable difference</b></p>	<p><b>No discernable difference</b></p>
			<p><b>Indicator Summary</b></p>	<p>There is no preference among the alternatives as there is currently no information available for this indicator. This will be assessed as part of the overall Project impact assessment, should this information be provided by Indigenous communities.</p>		
	<ul style="list-style-type: none"> <li>Changes in the experience of being on the land.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in noise.</li> </ul>	<ul style="list-style-type: none"> <li>Work with Indigenous communities to identify appropriate buffers for harvesting and cultural use sites and areas during alignment routing, component siting, and road design (e.g., site the road to be at least 1 hour (walking distance) away from harvesting sites).</li> <li>Implement appropriate mitigation measures for noise and visual – refer to respective VCs for mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the tranquility that is experienced when out on the land is important for maintaining connections to the land.</li> <li>1 MFFN trapping area intersected by the current alignment and associated aggregate areas.</li> <li>There are 4 MFFN land use locations that have been reported within 500 m of the</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the tranquility that is experienced when out on the land is important for maintaining connections to the land.</li> <li>4 Indigenous harvesting locations intersected by the current alignment and associated aggregate areas.</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the tranquility that is experienced when out on the land is important for maintaining connections to the land.</li> <li>4 Indigenous harvesting locations intersected by the current alignment and associated aggregate areas.</li> <li>1 MFFN hunting location has been reported within 500 m of the current alignment.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Aboriginal and Treaty Rights and Interests</b>						
			<ul style="list-style-type: none"> <li>Engage with Indigenous communities on construction schedule to identify key harvesting and cultural use times and sites and areas that should be avoided.</li> </ul>	<p>current alignment, including a trapping site and 3 travel routes; however, there is no information on whether these travel routes continue to be used or were used in the past.</p> <ul style="list-style-type: none"> <li>Not enough information is currently available to understand the potential net effects on the experience of being on the land from a noise perspective for this route alternative, and to compare the potential net effects between the two alternatives. No discernable difference between the route alternatives identified.</li> </ul>	<ul style="list-style-type: none"> <li>1 MFFN hunting location has been reported within 500 m of the current alignment.</li> <li>The alternative traverses an area reported by a MFFN member to be used by Aroland First Nation for traditional purposes – potential for additional traditional land use sites to be present along the current alignment.</li> <li>Not enough information is currently available to understand the potential net effects on the experience of being on the land from a noise perspective for this route alternative, and to compare the potential net effects between the two alternatives. No discernable difference between the route alternatives identified.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative traverses an area reported by a MFFN member to be used by Aroland First Nation for traditional purposes – potential for additional traditional land use sites to be present along the current alignment.</li> <li>Not enough information is currently available to understand the potential net effects on the experience of being on the land from a noise perspective for this route alternative, and to compare the potential net effects between the two alternatives. No discernable difference between the route alternatives identified.</li> </ul>
		<ul style="list-style-type: none"> <li>Changes in the visual environment.</li> </ul>		<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the natural landscape is important for maintaining connections to the land.</li> <li>The development of watercourse crossings (bridges) can impact the natural landscape (visual environment), and therefore the experience of being on the land.</li> <li>Changes to vegetation and ecosystems can change the landscape character, and therefore the experience of being on the land.</li> <li>Alternative 1 is the most preferred alternative, as the 2 Ogoki River crossings are both narrower at 70 m, and it is anticipated to result in the least amount of disturbance to upland ecosite types (21 ha), wetland and riparian ecosystems (598.72 ha), and peatland (541.59 ha). Therefore, this alternative is anticipated to have a lower visual impact.</li> </ul>	<p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the natural landscape is important for maintaining connections to the land.</li> <li>The development of watercourse crossings (bridges) can impact the natural landscape (visual environment), and therefore the experience of being on the land.</li> <li>Changes to vegetation and ecosystems can change the landscape character, and therefore the experience of being on the land.</li> <li>Alternatives 4 East and 4 West are the least preferred, as both traverse the Ogoki River at wider sections (120 m and 300 m, respectively) and would need a bridge to span a longer distance, potentially resulting in greater visibility and impact on the visual environment.</li> <li>Alternatives 4 East and 4 West are also anticipated to result in the greatest amount of disturbance of upland ecosite types (27 ha and 31 ha, respectively), wetland and riparian ecosystems (1,372.56 ha and 2,253.64 ha, respectively), and peatland (1,126.20 ha and 1,735.73 ha, respectively), and therefore a higher visual impact.</li> </ul>	<p><b>No discernable difference</b></p>
				<p><b>Most Preferred</b></p> <p>Alternative 1 is the most preferred route because it is anticipated to have the lowest net effects on the visual environment, and therefore on the experience of being on the land. Based on information currently available, there are no discernable difference between the routes from the perspective of changes to the noise environment. More information is required to understand the potential net effects from a noise perspective.</p>	<p><b>Least Preferred</b></p> <p>Alternatives 4 East and 4 West are the least preferred routes because they are anticipated to have the highest net effects on the noise environment, and therefore on the experience of being on the land. Based on information currently available, there are no discernable difference between the routes from the perspective of changes to the noise environment. More information is required to understand the potential net effects from a noise perspective.</p>	
			<p><b>Indicator Summary</b></p>			

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West		
<b>Aboriginal and Treaty Rights and Interests</b>								
	<ul style="list-style-type: none"> <li>Changes to ability to practice and transmit cultural traditions</li> </ul>	<ul style="list-style-type: none"> <li>Potential for changes in the ability to use preferred harvesting areas, camps, cabins, and ancestral locations (historical family or village sites, and traditional gathering areas and meeting places).</li> </ul>	<ul style="list-style-type: none"> <li>Avoid, where possible, preferred harvesting and cultural use sites and areas identified by communities.</li> <li>Work with Indigenous communities to identify mitigation measures for potential impacts on the ability to practice and transmit cultural traditions (e.g., schedule construction with consideration for preferred harvesting times where possible, support with developing on the land programming for members, including youth).</li> <li>Develop all temporary and permanent road signs to include local Indigenous language(s) on them.</li> <li>Work with local Indigenous communities to develop interpretative signage along the route. This could include information about the local Indigenous communities and their histories in the region and on the land, their culture, and / or the cultural landscape.</li> </ul>	<ul style="list-style-type: none"> <li>There is no information available on preferred MFFN harvesting areas in the area of this segment.</li> <li>The alternative does not intersect with any reported MFFN camps, seasonal campgrounds, cabins, historical family or village sites, or traditional gathering areas and meeting places.</li> <li>1 MFFN seasonal campground area reported within the Study Area (2.5 km).</li> <li>10 MFFN habitation and traditional gathering areas reported within the LSA (5 km): <ul style="list-style-type: none"> <li>8 camp sites or seasonal campgrounds;</li> <li>1 MFFN village site area; and</li> <li>A MFFN big gathering location.</li> </ul> </li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>There is no information available on preferred MFFN harvesting areas in the area of this segment.</li> <li>The alternative does not intersect with any reported MFFN camps, seasonal campgrounds, cabins, historical family or village sites, or traditional gathering areas and meeting places.</li> <li>1 MFFN seasonal campground within the Study Area, approx. 0.5 km east of the current alignment.</li> <li>2 MFFN village sites reported within the LSA (5 km).</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>There is no information available on preferred MFFN harvesting areas in the area of this segment.</li> <li>The alternative does not intersect with any reported MFFN camps, seasonal campgrounds, cabins, historical family or village sites, or traditional gathering areas and meeting places.</li> <li>1 MFFN seasonal campground within the Study Area, approx. 0.5 km east of the current alignment.</li> <li>2 MFFN habitation and traditional gathering areas reported within the LSA (5 km): <ul style="list-style-type: none"> <li>1 MFFN cabin; and</li> <li>1 MFFN village site area.</li> </ul> </li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>		
		<ul style="list-style-type: none"> <li>Potential for changes in ability to practice cultural traditions in the preferred way (preferred methods in the preferred time of year).</li> </ul>		<p style="text-align: center;"><b>No discernable difference</b></p>	<ul style="list-style-type: none"> <li>Information on how the ability to practice cultural traditions in the preferred way could be affected by the road and associated alternatives is not available at this time and will be assessed as part of the overall Project impact assessment.</li> </ul>	<p style="text-align: center;"><b>No discernable difference</b></p>	<ul style="list-style-type: none"> <li>Information on how the ability to practice cultural traditions in the preferred way could be affected by the road and associated alternatives is not available at this time and will be assessed as part of the overall Project impact assessment.</li> </ul>	<p style="text-align: center;"><b>No discernable difference</b></p>
		<ul style="list-style-type: none"> <li>Potential for changes in ability to access and use important teaching sites and areas, including place names and sites and areas of importance based on oral history / stories / legends.</li> </ul>		<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, place name sites contribute to the strengthening of the Ojibwe language and represent the passing down of knowledge, connection to the land, culture, and history.</li> <li>Similarly, teaching, legend, and / or storied sites support the passing of knowledge, connection to the land, culture, and history.</li> <li>One place name within the LSA.</li> <li>No reported teaching, legend, and / or storied sites in the LSA.</li> <li>Minimal net effects anticipated.</li> </ul>	<p style="text-align: center;"><b>Most Preferred</b></p>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, place name sites contribute to the strengthening of the Ojibwe language and represent the passing down of knowledge, connection to the land, culture, and history.</li> <li>Similarly, teaching, legend, and / or storied sites support the passing of knowledge, connection to the land, culture, and history.</li> <li>One place name site (Patience Lake, which is a widening of the Ogoki River) intersected by both Alternatives 4 East and 4 West, with crossings (120 m and 300 m bridge crossings, respectively) proposed in this area for both route options. Crossings at this place name site could potentially affect the use of this site by Indigenous community members.</li> <li>No reported teaching, legend, and / or storied sites in the LSA.</li> <li>The alternatives traverse an area reported by a MFFN member that may be used by Aroland First Nation for traditional purposes – potential for additional place name, teaching, legend, and / or storied sites in the area.</li> <li>Highest net effects given intersection with a place name site that requires watercourse crossings and given that the alternative traverses an area that may be used by Aroland First Nation for traditional purposes, with potential for additional place name, teaching, legend, and / or storied sites in the area of these route options.</li> </ul>	<p style="text-align: center;"><b>Least Preferred</b></p>	

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Aboriginal and Treaty Rights and Interests</b>						
			<b>Indicator Summary</b>	Alternative 1 is the most preferred route because there are no intersections with reported place name sites or sites and areas of importance based on oral history / stories / legends, and therefore it is anticipated to have the lowest net effect on the ability to practice and transmit cultural traditions. There are no discernable differences between the alternatives in terms of the potential for changes in ability to use habitation, ancestral, and / or preferred harvesting sites, and in ability to practice cultural traditions in the preferred way.		Alternatives 4 East and 4 West are the least preferred route options because they have the potential to impact a place name site reported by MFFN given the need for watercourse crossings at this site, and the alternatives traverses an area that may be used by Aroland First Nation for traditional purposes with potential for additional place name, teaching, legend, and / or storied sites in the area of these route options. Therefore, these alternatives are anticipated to have the greatest net effects on the ability to practice and transmit cultural traditions. There are no discernable differences between the alternatives in terms of the potential for changes in ability to use habitation, ancestral, and / or preferred harvesting sites, and in ability to practice cultural traditions in the preferred way.
<p><b>Summary of Aboriginal and Treaty Rights and Interests</b></p> <p><u>Overall</u></p> <ul style="list-style-type: none"> <li>Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Aboriginal and Treaty Rights and Interests, as it has the lowest potential for impacts on sites and areas used for traditional activities, the availability of lands and resources for traditional harvesting, culturally important sites and areas, experiences of being on the land (primarily visual environment considerations based on available information), and the ability to practice and transmit cultural traditions.</li> <li>Alternatives 4 East and 4 West are less preferred routes for Segment 1 – Ogoki Crossing from the perspective of Aboriginal and Treaty Rights and Interests. The differences between Alternative 4 East and 4 West are generally negligible.</li> </ul> <p><u>Impacts / Net Effects</u></p> <ul style="list-style-type: none"> <li>Anticipated and potential impacts / net effects were considered higher for Alternatives 4 East and 4 West, and lower for Alternative 1.</li> <li>Alternative 1 has the least intersection with reported Indigenous harvesting sites and it is the most preferred alternative identified by MFFN from an animal harvest perspective, therefore it is anticipated to have the lowest net effects on sites and areas used for traditional activities.</li> <li>Alternative 1 results in the least amount of land clearing and it is anticipated to have the lowest net effects on the resources used for traditional purposes, therefore it is anticipated to have the lowest net effects on the availability of lands and resources for traditional harvesting. Indirect effects of increased access to non-Indigenous land users and harvesters may not be fully mitigated, regardless of the alternative selected.</li> <li>There is no information currently available to determine the net effects of the alternatives on the quality, or perceived quality, of resources used for traditional purposes – this will be assessed in the future as part of the project impact assessment.</li> <li>All three alternatives would have similar impact with regard to changes in access to sites and areas used for traditional activities and culturally important sites and areas, with minimal impacts expected with appropriate mitigation and given the nature of the project (a road).</li> <li>Alternative 1 has the lowest potential for net effects on culturally important sites and areas given that there are no intersections with reported Indigenous cultural, spiritual, and / or historical sites or areas, and there are no burial sites reported within 2.5 km of the current alignment.</li> <li>There is no information currently available to determine the potential impact on the sufficiency of lands and resources for cultural practices – this will be assessed in the future as part of the project impact assessment, where information is provided by Indigenous communities.</li> <li>Alternative 1 is anticipated to have the lowest net effects on the visual environment, and therefore on the experience of being on the land. More information is required to understand the potential net effects from a noise perspective. Based on information currently available, there are no discernable difference between the routes from the perspective of the noise environment.</li> <li>Alternative 1 is anticipated to have the lowest net effect on the ability to practice and transmit cultural traditions as there are no intersections with reported place name sites or sites and areas of importance based on oral history / stories / legends. There are no discernable differences between the alternatives in terms of the potential for changes in ability to use habitation, ancestral, and / or preferred harvesting sites, and in ability to practice cultural traditions in the preferred way.</li> <li>The comprehensive assessment of impacts to Aboriginal and Treaty Rights and Interests will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC, depending on additional information provided by Indigenous communities in terms of land and resource use for traditional purposes and cultural traditions.</li> </ul> <p><u>Limitations</u></p> <ul style="list-style-type: none"> <li>There is relatively limited information on Indigenous land and resource use for traditional purposes in the area of Segment 1 – Ogoki Crossing relative to the other 2 segments.</li> <li>Information on Indigenous land and resource use for traditional purposes in the area of Segment 1 is largely limited to the MFFN community, and to the northern portions of all 3 route alternatives. There is currently very limited available information on land and resource use for traditional purposes by other Indigenous communities, including Aroland First Nation, in the area of Segment 1.</li> <li>The route preferences indicated in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project are based on new information collected as part of the study only; the stated preferences did not factor in MFFN Indigenous Knowledge, land use and occupancy information previously collected as part of the community-based land use planning process and shared with the Project Consultant Team in 2019.</li> <li>Information on whether locations and areas are presently used by MFFN for traditional purposes (or were only used in the past) is not available for most of the data provided by MFFN.</li> <li>It is unknown if, but unlikely that, all traditional land and resource use sites and areas reported have been ground-truthed to confirm location accuracy.</li> <li>There is no information on the weighting that would be applied by MFFN, Aroland First Nation, or other communities in terms of potential impacts to harvesting locations versus potential impacts to cultural, spiritual, and / or historical sites, including burial sites.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Water</b>						
<b>Fish, Fish Habitat</b>						
Fish and Fish Habitat VC: <ul style="list-style-type: none"> <li>Lake Sturgeon</li> <li>Walleye</li> <li>Brook Trout</li> <li>Northern Pike</li> <li>Lake Whitefish</li> <li>Burbot</li> </ul>	<ul style="list-style-type: none"> <li>Habitat Quantity and Quality.</li> <li>Distribution and connectivity to habitat and migration.</li> <li>Survival and reproduction.</li> </ul>	<ul style="list-style-type: none"> <li>Total number of waterbody crossings.</li> <li>Number of crossings requiring in-water work (e.g., culverts, bridge piers or abutments below the high-water mark).</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a Construction Environmental Management Plan (CEMP) by the Contractor.</li> <li>Adherence to in-water work timing windows.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Adherence to Fisheries and Oceans Canada's (DFO) <i>Measures to Protect Fish and Fish Habitat</i> (DFO 2023).</li> <li>Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>Measures to avoid unnecessary idling to minimize emissions and greenhouse gases (GHGs).</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Measures to limit the spread and / or introduction of invasive species.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>Cross 17 waterbodies.</li> <li>Cross 12 waterbodies requiring in-water work.</li> <li>Cross 3 waterbodies requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>Cross 18 waterbodies.</li> <li>Cross 9 waterbodies requiring in-water work.</li> <li>Cross 3 waterbodies requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>Cross 18 waterbodies.</li> <li>Cross 11 waterbodies requiring in-water work.</li> <li>Cross 5 waterbodies requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul> </li> </ul>

**Summary of Fish, Fish Habitat:**

- Overall
- Alternative 1 and Alternative 4 East are the most preferred alternatives for Segment 1 – Ogoki Crossing from the perspective of Fish and Fish Habitat.
  - The routes have the least number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.
  - Alternative 4 West is the least preferred alternative for Segment 1 – Ogoki Crossing from the perspective of Fish and Fish Habitat, because it has the greatest number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.
  - There is a negligible difference between the alternatives.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Water</b>						
<p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>The predicted net effect for each of the alternatives were evaluated as equivalent relative to each other, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions, without loss of function or individuals are predicted. This comparative analysis evaluated 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to the fish and fish habitat VC at the local or regional scale (i.e., LSA or Regional Study Area; RSA). The predicted net effects have not considered all potential mitigation that may be applied at a later stage of project design. The comprehensive assessment of net effects to the fish and fish habitat VC will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC.</li> </ul> <p><b>Notes:</b></p> <p>The requirement for in-water works were determined as follows:</p> <ul style="list-style-type: none"> <li>For waterbody crossings with bankfull widths less than 5 m, it is assumed that culverts would be used (requiring in-water work).</li> <li>For waterbody crossings with bankfull widths greater than or equal to 5 m and less than 25 m, it is assumed that clear span bridges would be used (no in-water work).</li> <li>For waterbody crossings greater than or equal to 25 m, it is assumed that bridges with piers and abutments would be used (requiring in-water work).</li> <li>For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it is assumed that in-water work would be required.</li> </ul>						
<b>Groundwater and Geochemistry</b>						
Groundwater	<ul style="list-style-type: none"> <li>Groundwater Quality: Degradation of physical and chemical characteristics of groundwater.</li> <li>Groundwater Quantity: Change in groundwater levels.</li> </ul>	<ul style="list-style-type: none"> <li>Areas of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination (hectares).</li> </ul>	<ul style="list-style-type: none"> <li>Design stormwater management features to contain runoff and allow it to infiltrate locally.</li> <li>Restore land cover on unused parts of road construction footprint (construction camps, aggregate pits).</li> <li>Implement spill prevention, monitoring, control and response programs for road construction and operation.</li> <li>Minimize or avoid using salt solutions for dust / ice control.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative will intersect 1,315 ha of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative will intersect 3,529 ha of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative will intersect 5,430 ha of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination.</li> </ul>
<b>Summary of Groundwater and Geochemistry:</b>						
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Groundwater and Geochemistry</b> in terms of reducing potential for impacting areas likely to have higher rates of groundwater recharge (infiltration) and highest vulnerability to contamination relative to the other alternatives.</li> <li>Alternative 4 West is the least preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Groundwater and Geochemistry in terms of reducing potential for impacting areas likely to have higher rates of groundwater recharge (infiltration) and highest vulnerability to contamination relative to the other alternatives.</li> <li>Alternative 4 East is the moderately preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Groundwater and Geochemistry in terms of reducing potential for impacting areas likely to have higher rates of groundwater recharge (infiltration) and highest vulnerability to contamination.</li> <li>Alternative 1 crosses over the least amount of area of coarse-grained and bedrock surficial materials.</li> <li>Alternative 4 West crosses over the greatest amount of area of coarse-grained and bedrock surficial materials.</li> <li>Alternative 4 East crosses over the second largest amount of area of coarse-grained and bedrock surficial materials.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>Alternative 1 results in lower net effects than Alternatives 4 East and 4 West. Alternative 4 West results in higher net effects relative to the other alternatives, and Alternative 4 East results in moderate net effects relative to the other alternatives. This comparative analysis evaluated 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to the groundwater and geochemistry VC at the local or regional scale (i.e., LSA or RSA). The comprehensive assessment of net effects to the groundwater and geochemistry VC will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Water</b>						
<b>Peatlands</b>						
Peatland Ecosystems	<ul style="list-style-type: none"> <li>Availability (decrease / increase of overall amount of peatland area).</li> <li>Distribution (changes to the arrangement and connectivity of peatlands).</li> <li>Function and Composition (change in plant species composition or ecological function).</li> </ul>	<ul style="list-style-type: none"> <li>Peatland area (hectares) disturbed per alternative.</li> <li>Number of peatlands type fragmented.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Avoid using peatlands for staging, where possible.</li> <li>Incorporate standard tree protection and Erosion and Sediment Control (ESC) measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for peatlands protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 541.59 ha of peatland and 14 peatland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,126.20 ha of peatland and 15 peatland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,735.73 ha of peatland and 18 peatland ecosite types.</li> </ul>

**Summary of Peatlands:**

Overall  
**Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Peatlands** as it results in the least loss of peatland area and impacts the fewest peatland types.

Peatland Area

- Alternative 1 is the most preferred as it results in the least direct loss of peatland area.
- Alternative 4 West is the least preferred as it results in the greatest loss of peatland area.

Number of Peatland Types Fragmented

- Alternative 1 is the most preferred as it impacts the fewest number of peatland types.
- Alternative 4 West is the least preferred as it impacts the greatest number of peatland types.

Net Effects

- Alternative 1 results in lower net effects than Alternatives 4 East and 4 West, as Alternative 1 is anticipated to disturb a smaller area of peatlands and fewer peatland ecosite types than Alternatives 4 East and 4 West. Alternative 4 West results in comparatively higher net effects, as it is anticipated to disturb a larger area of peatlands and more peatland ecosite types than Alternative 4 East and Alternative 1. Alternative 4 East results in comparatively moderate net effects. This comparative analysis evaluated 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to the peatlands VC at the local or regional scale (i.e., LSA or RSA). The predicted net effects have not considered all potential mitigation or design elements to maintain peatland function (e.g., hydrology) that may be applied at a later stage of project design. The comprehensive assessment of net effects to the peatlands VC will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC.

**Notes:**

- Note that for the purposes of the alternatives assessment, only the availability (area) of peatlands disturbed and the number of peatland types fragmented were used because these measures can be quantified and are unbiased. Loss of peatlands also reduces their overall function and ability to store carbon, so those indicators are indirectly being assessed by determining the area of peatlands lost and fragmented.
- This analysis is based on mapping that doesn't incorporate data collected during the 2023 field programs. This 2023 field information may refine the peatlands mapping that will be included in final reporting.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Water</b>						
<b>Surface Water</b>						
Surface Water	<ul style="list-style-type: none"> <li>Surface Water Quantity.</li> <li>Surface Water Quality.</li> </ul>	<ul style="list-style-type: none"> <li>Total number of waterbody crossings.</li> <li>Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features (e.g., sensitive fish communities, areas of known channel instability).</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Measures to avoid unnecessary vehicle and machine idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas a minimum of 30 m from waterbodies.</li> <li>Wash water from vehicles and equipment will not be allowed to enter a waterbody and will be conveyed to areas for infiltration, treated prior to discharge to the receiving environment, or hauled off-site.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>Cross 17 waterbodies, all of which are inferred as permanent.</li> <li>Intersect 31,182 m<sup>2</sup> of wetted area within the proposed corridor.</li> <li>Cross 12 waterbodies (with 25,091 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work.</li> <li>Cross 6 waterbodies (with 22,927 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>Cross 18 waterbodies, all of which are inferred as permanent.</li> <li>Intersect 46,575 m<sup>2</sup> of wetted area within the proposed corridor.</li> <li>Cross 9 waterbodies (with 31,945 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work.</li> <li>Cross 3 waterbodies (with 30,810 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>Cross 18 waterbodies, all of which are inferred as permanent.</li> <li>Intersect 22,945 m<sup>2</sup> of wetted area within the proposed corridor.</li> <li>Cross 11 waterbodies (with 11,045 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work.</li> <li>Cross 5 waterbodies (with 9,010 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>

**Summary of Surface Water:**

- Overall
- Alternative 4 West is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Surface Water, albeit by a small margin.
  - Alternative 4 West includes one more crossing than Alternative 1, but it carries a total wetted area that is roughly one third less than Alternative 1 and roughly half of Alternative 4 East. Similarly, even though Alternative 4 West includes 2 more crossings with heightened relevance or sensitivity than Alternative 4 East, the total wetted area for crossings with heightened relevance or sensitivity for Alternative 4 West is less than half of the total wetted area for Alternative 4 East. Alternative 4 West also includes one less crossing with heightened relevance or sensitivity than Alternative 1, and it carries a total wetted area for crossings with heightened relevance or sensitivity that is roughly half of Alternative 1.
  - Alternative 1 is the least alternative for Segment 1 – Ogoki Crossing from the perspective of Surface Water, albeit by a small margin.
  - Alternative 1 has one less crossing than both Alternatives 4 East and 4 West, but it carries a total wetted area that is greater than Alternative 4 West and smaller than Alternative 4 East, and includes more crossings with heightened relevance or sensitivity to effects than the other two alternatives (one more than Alternative 4 West and three more than Alternative 4 East).
  - Alternative 4 East is the moderately preferred alternative for Segment 1 – Ogoki Crossing from the perspective of Surface Water, albeit by a small margin.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Water</b>						
<ul style="list-style-type: none"> <li>Alternative 4 East has one more crossing than Alternative 1 and the same number of crossings as Alternative 4 West, carries a total wetted area that is greater than both Alternative 1 and Alternative 4 West, and includes the least amount of crossings with heightened relevance or sensitivity to effects than the other two alternatives (three less than Alternative 1 and two less than Alternative 4 West).</li> </ul>						
<u>Net Effects</u>						
<ul style="list-style-type: none"> <li>The predicted net effect for each of the alternatives was evaluated as equivalent relative to each other, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures (including properly sized and designed water crossing structures, installation and maintenance of appropriate erosion and sediment controls, and implementation of construction best management practices), the potential effects on surface water receivers are expected to be limited.</li> </ul>						
<b>Notes:</b>						
The requirement for in-water determined as follows:						
<ul style="list-style-type: none"> <li>For waterbody crossings with bankfull widths less than 5 m, it is assumed that culverts would be used (requiring in-water work).</li> <li>For waterbody crossings with bankfull widths greater than or equal to 5 m and less than 25 m, it is assumed that clear span bridges would be used (no in-water work).</li> <li>For waterbody crossings greater than or equal to 25 m, it is assumed that bridges with piers and abutments would be used (requiring in-water work).</li> <li>For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it is assumed that in-water work would be required.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
<b>Physiography, Terrain and Soils</b>						
Physiography, Terrain and Soils	Quantity and distribution of terrain units.	Area of surficial materials disturbed per alternative.	<ul style="list-style-type: none"> <li>Minimize areas of vegetation clearing and soil disturbance.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 1,509 ha of surficial materials;</li> <li>intersect 0 ha of potential land with permafrost;</li> <li>intersect 0 ha of Class IV and 1.3 ha (&lt;0.1% of alternative footprint) of Class V terrain; and</li> <li>disturb 8 significant landforms.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 3,754 ha of surficial materials;</li> <li>intersect 0 ha of potential land with permafrost;</li> <li>intersect 0.5 ha of Class IV (&lt;0.1% of alternative footprint) and 0.0 ha of Class V terrain; and</li> <li>disturb 10 significant landforms.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 5,509 ha of surficial materials;</li> <li>intersect 0 ha of potential land with permafrost;</li> <li>intersect 0.5 ha of Class IV (&lt;0.1% of alternative footprint) and 0.0 ha of Class V terrain; and</li> <li>disturb 10 significant landforms.</li> </ul> </li> </ul>
		Area of potential land with permafrost processes intersected per alternative.				
		Area of surficial materials disturbed per alternative.				
		Area of class IV and V terrain stability per alternative.				
		Number of significant landforms disturbed per alternative. <sup>1</sup>				
	Quantity and distribution of soil map units.	Area of soil disturbed (excludes non-soils such as bedrock and water) per alternative.	<ul style="list-style-type: none"> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, temporary construction camps, laydown areas).</li> <li>Minimize areas of vegetation clearing and soil disturbance.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for soil erosion, salvage, and handling.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,490 ha of soil (99% of the alternative footprint).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 3,574 ha of soil (91% of the alternative footprint).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4,525 ha of soil (82% of the alternative footprint).</li> </ul>
	Soil Quality / Productivity.	<ul style="list-style-type: none"> <li>Area of high-water erosion risk disturbed per alternative.</li> <li>Area of high wind erosion risk disturbed per alternative.</li> <li>Amount of soil that is considered suitable for reclamation.<sup>2</sup></li> <li>Area of high compaction risk disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>Use clearing equipment that minimizes surface disturbance, soil compaction and topsoil loss (e.g., equipment with low ground pressure tracks or tires, blade shoes, and brushes), where feasible.</li> <li>Where soils are prone to wind erosion, tackify, cover, seed, and / or apply water during periods of high erosion potential (e.g., summer and fall).</li> <li>To the extent practical, work in areas of high-water erosion would be scheduled to avoid periods that may result in high flow volumes and / or increase erosion and sedimentation (e.g., spring freshet).</li> <li>Minimize soil disturbance by building on bedrock, where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 0.2 ha (&lt;0.1% of alternative footprint) of area with high-water erosion risk;</li> <li>disturb 134 ha (9% of alternative footprint) of area with high wind erosion risk;</li> <li>disturb 815 ha (54% of alternative footprint) of soil that is considered suitable for reclamation; and</li> <li>Intersect 100 ha (7% of alternative footprint) of area with high compaction risk.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 1.5 ha (&lt;0.1% of alternative footprint) of area with high-water erosion risk;</li> <li>disturb 358 ha (10% of alternative footprint) of area with high wind erosion risk;</li> <li>Disturb 1,758 ha (49% of alternative footprint) of soil that is considered suitable for reclamation; and</li> <li>intersect 206 ha (6% of alternative footprint) of area with high compaction risk.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 1.2 ha (&lt;0.1% of alternative footprint) of area with high-water erosion risk;</li> <li>disturb 449 ha (8% of alternative footprint) of area with high wind erosion risk;</li> <li>disturb 2,506 ha (46% of alternative footprint) of soil that is considered suitable for reclamation; and</li> <li>intersect 501 ha (6% of alternative footprint) of area with high compaction risk.</li> </ul> </li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
			<ul style="list-style-type: none"> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for soil erosion, salvage, and handling.</li> <li>Construct in winter to avoid compaction, where feasible.</li> </ul>			
<b>Summary of Physiography, Terrain and Soils:</b>						
<u>Overall</u>						
<ul style="list-style-type: none"> <li><b>Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Physiography, Terrain and Soils</b> as this alternative is anticipated to disturb fewer significant landforms and a smaller area of surficial materials, soil, areas of high-water and wind erosion risk, soil suitable for reclamation and soil with high risk of compaction than Alternatives 4 East and 4 West.</li> <li>Alternative 4 West is the least preferred route alternative for Segment 1 – Ogoki Crossing the perspective of physiography, terrain and soils as this alternative will disturb more or similar significant landforms and a larger area of surficial materials, soil, areas of high wind erosion risk, soil suitable for reclamation and soil with high risk of compaction than Alternative 1 and Alternative 4 East.</li> <li>Alternative 4 East is the moderately preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Physiography, Terrain and Soils as this alternative will disturb more significant landforms and a larger area of surficial materials, soil, areas of high wind erosion risk, soil suitable for reclamation and soil with high risk of compaction than Alternative 1, but the same number of significant landforms and a smaller area of surficial materials, soil, areas of high wind erosion risk, soil suitable for reclamation and soil with high risk of compaction than Alternative 4 West.</li> <li>No permafrost processes were identified to intersect with any of the three alternatives.</li> <li>Alternative 4 West would remove the largest area of surficial materials.</li> <li>Although Alternative 4 West would potentially have the lowest percentage of soil disturbance based on the area of non-soils (water, bedrock, anthropogenic areas), it has the largest footprint and still would potentially affect the most area of soil.</li> <li>All 3 options have low percentages of soil potentially at risk for water erosion (&lt;0.1%); however, Alternative 4 West would disturb the most as it has the largest footprint.</li> <li>Although Alternative 4 East would disturb the highest percentage of soil having a high wind erosion risk (10%), Alternative 4 West would disturb the most area of soil at a high risk of wind erosion as it has the largest footprint.</li> <li>Nearly half (49%) of the soil in the Alternative 4 East area is rated as being of suitable quality for reclamation (i.e., soil used to reclaim temporarily disturbed areas following construction); however, Alternative 4 West has the largest footprint, and therefore will affect more soil that is potentially suitable for reclamation.</li> <li>Alternative 4 West has the largest percentage (9%) and area (501 ha) of soils that are potentially at risk of compaction.</li> </ul>						
<u>Net Effects</u>						
<ul style="list-style-type: none"> <li>Alternative 1 results in comparatively lower net effects than Alternatives 4 East and 4 West. Alternative 4 West results in higher net effects relative to the other alternatives, and Alternative 4 East results in moderate net effects relative to the other alternatives. This comparative analysis evaluated three route alternatives based on the interaction of their PDAs and the representative indicator measures, and did not consider the effects to physiography, terrain and soil VC at the local or regional scale (i.e., LSA or RSA). The comprehensive assessment of net effects to the physiography, terrain and soils VC, will be completed on the preferred route selected, and may result in a different determination of predicted net effects.</li> </ul>						
<b>Notes:</b>						
<ol style="list-style-type: none"> <li>The number of significant landforms noted is subjective and may be a conservative value. This measure will be re-evaluated with Indigenous Knowledge input, and information from the wildlife and vegetation disciplines. As a result, the data presented here may differ from the final effects analysis.</li> <li>Soil with a rating of Good, Fair or Poor were considered suitable for reclamation.</li> </ol> <ul style="list-style-type: none"> <li>Some numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.</li> </ul>						
<b>Ungulates</b>						
Moose	<ul style="list-style-type: none"> <li>Habitat availability.</li> <li>Habitat distribution.</li> </ul>	<ul style="list-style-type: none"> <li>Area of high suitability habitat disturbed per segment alternative</li> <li>Number of suitable habitat features disturbed per segment (e.g., number of suitable moose aquatic feedings areas, calving sites, known mineral licks).</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> <li>Alternative 4 East minimizes the amount of high suitability that will be removed (avoidance measure).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 503 ha of high suitability habitat within the PDA, 2,993 ha of high suitability habitat within the PDA including a 500-m buffer and is not anticipated to disturb any suitable habitat features.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 410 ha of high suitability habitat within the PDA, 2,263 ha of high suitability habitat within the PDA including a 500-m buffer and is not anticipated to disturb any suitable habitat features.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 820 ha of high suitability habitat within the PDA, 3,259 ha of high suitability habitat within the PDA including a 500-m buffer and is not anticipated to disturb any suitable habitat features.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
Caribou	<ul style="list-style-type: none"> <li>Habitat availability.</li> <li>Habitat distribution – includes spatial extent and distribution of GHD Category 1, 2, and 3 habitats (MNR, 2013a) and availability and distribution of habitat which contain biophysical attributes necessary for caribou seasonal and life stage activities (ECCC 2019).</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of known and potential Category 1 GHD WINTER USE AREAS that would be impacted per segment alternative.</li> <li>Area (hectares) of known and potential Category 1 GHD NURSERY AREAS that would be impacted per segment alternative.</li> <li>Area (hectares) of known and potential Category 1 GHD TRAVEL CORRIDOR AREAS that would be impacted per segment alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Avoid sensory disturbances within 10 km of known high-use areas during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> <li>Alternative 1 avoids removing known and potential winter use and nursery areas in the caribou range but will result in loss of habitat in the range of a threatened species (avoidance measure).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known and potential Category 1 GHD winter use areas, nursery areas or travel corridors.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat travel corridors; however, it is anticipated to disturb the following known and potential Category 1 GHD winter use areas and nursery areas: <ul style="list-style-type: none"> <li><b>Winter Use Areas:</b> 215 ha within the PDA, 1,857 ha within the PDA including a 500-m buffer.<sup>1</sup></li> <li><b>Nursery Areas:</b> 21 ha within the PDA, 227 ha within the PDA including a 500-m buffer.<sup>1</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the following known and potential Category 1 GHD winter use areas, nursery areas and travel corridors: <ul style="list-style-type: none"> <li><b>Winter Use Areas:</b> 815 ha within the PDA, 3,341 ha within the PDA including a 500-m buffer.<sup>1</sup></li> <li><b>Nursery Areas:</b> 204 ha within the PDA, 1,005 ha within the PDA including a 500-m buffer.<sup>1</sup></li> <li><b>Travel Corridors:</b> 739 ha within the PDA, 1,324 ha within the PDA including a 500-m buffer.<sup>1</sup></li> </ul> </li> </ul>

**Summary of Ungulates:**

Overall

- **Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Ungulates**, as it is anticipated that it would result in lower net effects on caribou relative to the other two alternatives.
- Alternative 4 East is the moderately preferred route alternative for Segment 1 – Ogoki Crossing, as it would result in higher net effects on caribou compared to Alternative 1, but lower net effects than Alternative 4 West.
- Alternative 4 West is the least preferred route alternative from the perspective of Ungulates for Segment 1 – Ogoki Crossing as it is anticipated that it would result in the highest net effects on moose and caribou.
- All Alternatives avoid known (mapped) moose aquatic feeding areas, calving sites and mineral licks. Alternative 1 removes 503 ha of high suitability moose habitat, Alternative 4 East removes 410 ha of high suitability moose habitat, and Alternative 4 West removes 820 ha of high suitability habitat.
- Although Alternative 1 removes 503 ha of high suitability moose habitat, this segment avoids removing known and potential Category 1 habitat for caribou (i.e., areas within the range that have lowest tolerance to alteration before their function in supporting caribou is compromised; MNR, 2013a). However, it is important to note that this route (as well as Alternatives 4 East and 4 West) will still remove caribou habitat (direct effect), which may be depended on directly or indirectly for life processes, even if it is not considered Category 1. Indirect effects of habitat removal for this species at risk (SAR), including sensory disturbance, increased mobility for predators and hunters, and increased vehicle traffic, cannot be fully mitigated regardless of the Alternative segment.

Net Effects

- Indirect effects of habitat removal for moose and caribou, including sensory disturbance, increased mobility for predators and hunters, and increased vehicle traffic, cannot be fully mitigated regardless of the Alternative segment. As a result, all alternative routes for Ogoki Crossing are assessed as having equivalent net effects for moose and caribou. This comparative analysis evaluated the 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to ungulate VCs at the local or regional scale (i.e., LSA or RSA). The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the ungulate VCs will be completed on the preferred route selected and may result in a different determination of predicted net effects to these individual VCs.

**Notes:**

1. A 500 m buffer is used to capture indirect disturbances to habitat features such as noise and dust.
- Known Category 1 areas are derived from Ontario Government Caribou GHD for Forest-dwelling caribou (MNR, 2013a). The identification of “potential new” Category 1 winter use areas and nursery areas is based on 50% Kernel Density Estimation (KDE) polygons derived from MFFN and Ministry of Natural Resources (MNR) collar data between 2020 to 2023. The 50% KDE represents the core area used during the date periods identified by Ontario for the current GHD Category 1 areas. “Potential new” travel corridors are derived from 95% KDE derived from MFFN and MNR collar data between 2020 and 2023. The 95% KDE was used for the travel corridors because travel corridors are more linear in extent and do not have core areas relative to winter use and nursery areas. In areas where travel corridors overlap winter use or nursery areas, they are not double counted in the calculation of habitat removed.
  - Known Moose Aquatic Feeding Areas, Mineral Licks, and moose calving sites are derived from Ontario Government.
  - This information may be re-evaluated with Indigenous Knowledge input and / or additional collar data, when available. As a result, the data presented here may differ from the final effects analysis.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
<b>Wildlife</b>						
Bats (including SAR – Little Brown Myotis, Northern Myotis, Tri-coloured Bat)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally) including critical habitat for SAR.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of moderate to high suitability bat maternity roost habitat disturbed per alternative.</li> <li>Area (hectares) of foraging habitat (open wetlands and waterbodies adjacent to roosting habitat).</li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable maternity roost habitat during the bat active season.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb: <ul style="list-style-type: none"> <li>133.71 ha of moderate to high suitability bat maternity roost habitat.</li> <li>60.72 ha of foraging habitat.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb: <ul style="list-style-type: none"> <li>418.38 ha of moderate to high suitability bat maternity roost habitat.</li> <li>1,449.06 ha of foraging habitat.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb: <ul style="list-style-type: none"> <li>430.26 ha of moderate to high suitability bat maternity roost habitat.</li> <li>2,480.5 ha of foraging habitat.</li> </ul> </li> </ul>
Fur Bearers (American Marten)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally) including critical habitat for SAR.</li> </ul>	<ul style="list-style-type: none"> <li>Relative abundance of furbearers (American Marten).<sup>1</sup></li> <li>Area (hectares) of moderate / high-quality American Marten habitat disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 1.47 American Marten and is anticipated to disturb 1,300.13 ha of moderate / high-quality American Marten habitat.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 2.81 American Marten and is anticipated to disturb 3,233.57 ha of moderate / high-quality American Marten habitat.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 2.69 American Marten and is anticipated to disturb 4,763.27 ha of moderate / high-quality American Marten habitat.</li> </ul>
Fur Bearers (SAR Wolverine)		<ul style="list-style-type: none"> <li>Presence / relative abundance of wolverine females and individuals of unknown sex per alternative.</li> <li>Presence of observed denning areas (from field observations).<sup>2</sup></li> <li>Relative abundance of wolverine.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>If a denning area is identified, avoid construction activities within 4 km during the wolverine denning season.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 0.29 wolverine, the presence or abundance of 0 female wolverine and 2 wolverine individuals of unknown sex.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 0.50 wolverine, the presence or abundance of 1 female wolverine and 2 wolverine individuals of unknown sex.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 0.50 wolverine, the presence or abundance of 1 female wolverine and 3 wolverine individuals of unknown sex.</li> </ul>
Amphibians and Reptiles	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (if possible both spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally).</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of high suitability breeding ecosites per alternatives (amphibians).</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 577.49 ha of high suitability breeding ecosites.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,306.22 ha of high suitability breeding ecosites.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 2,175 ha of high suitability breeding ecosites.</li> </ul>

**Summary of Wildlife:**

Overall

- Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Wildlife, as it is anticipated that it would result in the least impacts on bats, American marten, wolverine, and amphibians.
- Alternative 4 East is the moderately preferred route alternative for Segment 1 – Ogoki Crossing, as it would result in more impacts on bats, American marten, wolverine, and amphibians compared to Alternative 1, but less impact than Alternative 4 West.
- Alternative 4 West is the least preferred for alternative of Segment 1 – Ogoki Crossing for wildlife as it is anticipated that it would result in the greatest negative impacts on bats, American marten, wolverine, and amphibians.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
<u>Bats</u>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Bats, as it results in the least direct loss of both suitable bat maternity roost habitat and bat foraging habitat.</li> <li>Alternative 4 West is the least preferred for Bats, as it results in the greatest direct loss of both suitable bat maternity roost habitat and bat foraging habitat.</li> </ul>						
<u>Furbearers (American Marten)</u>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for American Marten, as it results in the least direct loss of moderate / high-quality American marten habitat.</li> <li>Alternative 4 West is the least preferred for American Marten, as it results in the greatest direct loss of moderate / high-quality American marten habitat.</li> </ul>						
<u>Furbearers (Wolverine)</u>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Wolverine, as it has the lowest wolverine relative abundance and has the fewest number of observations of female wolverine and wolverines of unknown sex.</li> <li>Alternative 4 West is the least preferred for Wolverine, as it the highest wolverine relative abundance and has the largest number of observations of female wolverine and wolverines of unknown sex.</li> </ul>						
<u>Amphibians and Reptiles</u>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Amphibians and Reptiles, as it results in the least direct loss of suitable amphibian breeding habitat.</li> <li>Alternative 4 West is the least preferred for Amphibians and Reptiles, as it results in the greatest direct loss of suitable amphibian breeding habitat.</li> </ul>						
<u>Net Effects</u>						
<ul style="list-style-type: none"> <li>Predicted net effects were considered comparatively higher for Alternative 4 West, moderate for Alternative 4 East, and lower for Alternative 1. This comparative analysis evaluated 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to the wildlife VC at the local or regional scale (i.e., LSA or RSA). Therefore, as the PDA for each alternative is anticipated to permanently remove or disturb measures of the proposed indicators. Predicted net effects have not considered all potential mitigation that may be applied at a later stage of project design. The comprehensive assessment of net effects to the wildlife VC will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC.</li> </ul>						
<b>Notes:</b>						
<ol style="list-style-type: none"> <li>Relative abundance metrics are calculated as the average number of sightings (wolverine) or tracks (American marten) per station for stations that overlap route alternatives.</li> <li>Female observations are split into the total number of known female animals observed per route segment. Wolverines of unknown sex are the sum of the total known animals with unknown sex and unidentifiable individuals. Unidentifiable individuals are assumed to be unique individuals.</li> </ol> <ul style="list-style-type: none"> <li>It is important to note that all route segments that bisect wolverine habitat have a direct effect as this species utilizes large home ranges and they rely on intact areas of wilderness directly or indirectly for life processes. Indirect effects of habitat removal for this SAR, including sensory disturbance and increased vehicle traffic, cannot be fully mitigated regardless of the Alternative segment.</li> </ul>						
<b>Vegetation</b>						
Wetland and Riparian Ecosystems	<ul style="list-style-type: none"> <li>Availability (abundance spatially and temporally).</li> <li>Distribution.</li> <li>Function and Composition.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of wetland and riparian ecosystems disturbed per alternative.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Avoid using wetland and riparian areas for staging, where possible.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation and wetland protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 598.72 ha of wetland and riparian ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,372.56 ha of wetland and riparian ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 2,253.64 ha of wetland and riparian ecosystems.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
Upland Ecosystems	<ul style="list-style-type: none"> <li>Availability (abundance spatially and temporally).</li> <li>Distribution.</li> <li>Function and Composition.</li> </ul>	<ul style="list-style-type: none"> <li>Number of upland ecosite types disturbed per alternative.<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 21 upland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 27 upland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 31 upland ecosite types.</li> </ul>
Traditional Use Plants and SAR Plant Populations (Including species with special conservation status or rarity in the province)	<ul style="list-style-type: none"> <li>Species presence</li> <li>Accessibility to traditional use of plants</li> <li>Accessibility to traditional use of plants</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of highly suitable and highly accessible (High = score of 1.5 – 2.0) habitat for Traditional Use Plants disturbed per alternative.</li> <li>Area (hectares) of suitable habitat for SAR / Species of Conservation Concern (SCC) Plants (Black Ash, Northern Marsh Violet) disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 245.74 ha of highly suitable and highly accessible habitats for Traditional Use Plants and 1,512.58 ha of suitable SAR / SCC habitat.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,712.91 ha of highly suitable and highly accessible habitats for Traditional Use Plants and 3,596.44 ha of suitable SAR / SCC habitat.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 2,244.53 ha of highly suitable and highly accessible habitats for Traditional Use Plants and 5,536.38 ha of suitable SAR / SCC habitat.</li> </ul>

**Summary of Vegetation:**

- Overall
- Alternative 1 is the most preferred route alternative for Segment 1 - Ogoki Crossing from the perspective of Vegetation, as it has lower net effects than the other alternatives due to a smaller direct loss of wetland and riparian ecosystems, disturbance of fewer upland ecosite types, smaller direct loss of highly suitable and highly accessible habitats for Traditional Use Plants, and it has the least impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).
  - Alternative 4 West is the least preferred route alternative for Segment 1 - Ogoki Crossing from the perspective of Vegetation.
  - Alternative 4 East is the moderately preferred route alternative for Segment 1 - Ogoki Crossing from the perspective of Vegetation.
- Wetlands and Riparian Ecosystems
- Alternative 1 is the most preferred route alternative for wetlands and riparian ecosystems as it results in the least direct loss of wetland and riparian ecosystems.
  - Alternative 4 West is the least preferred route alternative for wetlands and riparian ecosystems as it results in the greatest direct loss of wetland and riparian ecosystems.
  - Alternative 4 East is the moderately preferred route alternative for wetlands and riparian ecosystems as it results in a smaller loss of wetland riparian ecosystems compared to Alternative 4 West but a greater loss of wetland and riparian ecosystems compared to Alternative 1.
- Upland Ecosystems
- Alternative 1 is the most preferred route alternative for upland ecosystems as it disturbs the fewest upland ecosite types.
  - Alternative 4 West is the least preferred route alternative for upland ecosystems as it disturbs the greatest number of ecosite types.
  - Alternative 4 East is the moderately preferred route alternative for upland ecosystems as it disturbs fewer upland ecosite types than Alternative 4 West but a greatest number of ecosite types than Alternative 1.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
<i>Traditional Use Plants and SAR / SCC Plant Populations</i>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred route alternative for traditional use plants as it results in the least direct loss of highly suitable and highly accessible habitats for Traditional Use Plants.</li> <li>Alternative 4 West is the least preferred route alternative for traditional use plants as it results in the greatest direct loss of highly suitable and highly accessible habitats for Traditional Use Plants.</li> <li>Alternative 4 East is the moderately preferred route alternative for traditional use plants as it disturbs fewer upland ecosite types than Alternative 4 West but a greatest number of ecosite types than Alternative 1.</li> <li>Alternative 1 is the most preferred route alternative for SAR / SCC Plant Populations as it has the least impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).</li> <li>Alternative 4 West is the least preferred route alternative for SAR / SCC Plant Populations as it has the greatest impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).</li> <li>Alternative 4 East is the moderately preferred route alternative for SAR / SCC Plant Populations as it has a smaller impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet) than Alternative 4 West, but a greater impact than Alternative 1.</li> </ul>						
<i>Net Effects</i>						
<ul style="list-style-type: none"> <li>Predicted net effects were considered higher for Alternatives 4 East and 4 West, and lower for Alternative 1. This comparative analysis evaluated the 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to vegetation VCs at the local or regional scale (i.e., LSA or RSA). The predicted relative net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the vegetation VCs will be completed on the preferred route selected and may result in a different determination of predicted net effects to these individual VCs.</li> </ul>						
<b>Notes:</b>						
<ol style="list-style-type: none"> <li>Note that for the purposes of the alternatives assessment, only the availability of wetland and riparian ecosystems indicator was included. Area of loss as a metric was used because the area of direct impact would be the most important on the ecosystem. The more area that is removed, the less likely the ecosystem would be able to maintain its functions. The Distribution, Function and Composition Indicators will be addressed for the preferred alternative in the EA / IS Document.</li> <li>Number of upland ecosite types as a metric is proposed because this provides a measure of impact on forest biodiversity rather than just area, which could be attributed to the overall length of the route alternative rather than where the alternative is specifically located.</li> </ol> <ul style="list-style-type: none"> <li>A preliminary conservative approach has been taken to classifying SAR and SCC habitats and the mapping is based on a limited amount of field information. The mapping that informed this evaluation is expected to be refined for final reporting.</li> <li>This analysis is based on mapping that doesn't incorporate data collected during the 2023 field programs. Additional field data from the summer 2023 field season will be incorporated into the dataset and considered in the assessment of Project and cumulative effects from the preferred alternative.</li> <li>Although impacts to Provincial Parks were not included as a measure in the vegetation alternatives analysis, it is also noteworthy that Alternative 1 avoids direct impact to the Ogoki River Provincial Park.</li> </ul>						
<b>Birds</b>						
Species at Risk Forest and Wetland Birds  (e.g., Canada warbler, chimney swift, eastern whip-poor-will, eastern wood-pewee, evening grosbeak, olive-sided flycatcher, bank swallow, barn swallow, black tern, rusty blackbird, yellow rail)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally) of SAR.</li> <li>Habitat availability and distribution (spatially and temporally) including critical habitat (where known), were defined for SAR.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of moderate to high suitability bird SAR habitat disturbed in the PDA.</li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable bird nesting habitat during the breeding bird period.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during the breeding bird period.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the moderate to high suitability habitat of the following bird SAR:               <ul style="list-style-type: none"> <li>Canada warbler: 699.2 ha</li> <li>Chimney swift: 1.8 ha</li> <li>Common nighthawk: 868.5 ha</li> <li>Eastern whip-poor-will: 25.0 ha</li> <li>Eastern wood-pewee: 138.6 ha</li> <li>Evening grosbeak: 896.0 ha</li> <li>Lesser yellowlegs: 872.5 ha</li> <li>Olive-sided flycatcher: 15.9 ha</li> <li>Bald eagle: 134.9 ha</li> <li>Peregrine falcon: 0.0 ha</li> <li>Short-eared owl: 29.6 ha</li> <li>Bank swallow: 1.8 ha</li> <li>Barn swallow: 1.8 ha</li> <li>Black tern: 55.2 ha</li> <li>Rusty blackbird: 557.8 ha</li> <li>Yellow rail: 64.2 ha</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the moderate to high suitability habitat of the following bird SAR:               <ul style="list-style-type: none"> <li>Canada warbler: 1,699.8 ha</li> <li>Chimney swift: 0.1 ha</li> <li>Common nighthawk: 1,456.9 ha</li> <li>Eastern whip-poor-will: 51.9 ha</li> <li>Eastern wood-pewee: 421.4 ha</li> <li>Evening grosbeak: 2,228.4 ha</li> <li>Lesser yellowlegs: 1,815.4 ha</li> <li>Olive-sided flycatcher: 125.0 ha</li> <li>Bald eagle: 106.6 ha</li> <li>Peregrine falcon: 20.2 ha</li> <li>Short-eared owl: 97.6 ha</li> <li>Bank swallow: 0.1 ha</li> <li>Barn swallow: 0.1 ha</li> <li>Black tern: 89.3 ha</li> <li>Rusty blackbird: 1,329.0 ha</li> <li>Yellow rail: 110.8 ha</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the moderate to high suitability habitat of the following bird SAR:               <ul style="list-style-type: none"> <li>Canada warbler: 2,576.3 ha</li> <li>Chimney swift: 0.1 ha</li> <li>Common nighthawk: 2,971.5 ha</li> <li>Eastern whip-poor-will: 60.8 ha</li> <li>Eastern wood-pewee: 433.6 ha</li> <li>Evening grosbeak: 3,295.7 ha</li> <li>Lesser yellowlegs: 3,189.6 ha</li> <li>Olive-sided flycatcher: 474.6 ha</li> <li>Bald eagle: 183.1 ha</li> <li>Peregrine falcon: 20.2 ha</li> <li>Short-eared owl: 118.4 ha</li> <li>Bank swallow: 0.1 ha</li> <li>Barn swallow: 0.1 ha</li> <li>Black tern: 93.7 ha</li> <li>Rusty blackbird: 2,202.9 ha</li> <li>Yellow rail: 131.3 ha</li> </ul> </li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
		<ul style="list-style-type: none"> <li>Area of known provincial <i>Endangered Species Act</i> (ESA) regulated habitat or federal <i>Species at Risk Act</i> (SARA) critical habitat for SAR birds.<sup>1</sup></li> </ul>		<ul style="list-style-type: none"> <li>This alternative is also anticipated to disturb 7.1 ha of known provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.<sup>1</sup></li> </ul>
Raptors (e.g., bald eagle)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally).</li> </ul>	<ul style="list-style-type: none"> <li>Number of habitat features and area (hectares) disturbed: <ul style="list-style-type: none"> <li>Raptor nest locations.</li> </ul> </li> <li>Stopover sites (if present).<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Avoid sensory disturbances within 800 m of known bald eagle nests.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is anticipated to disturb 4 stopover sites (2.5 ha). No known raptor nests are anticipated to be disturbed.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is anticipated to disturb 4 stopover sites (0.06 ha) and 1 bald eagle nest (2.9 ha).</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is anticipated to disturb 4 stopover sites (0.06 ha) and 1 bald eagle nest (2.9 ha).</li> </ul>
Shorebirds	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally).</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of confirmed and suitable habitat features disturbed (e.g., stopover sites).<sup>3,4,5</sup></li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable bird nesting habitat during the breeding bird period.</li> <li>Avoid clearing within 100 m of suitable stopover sites during the spring and fall bird migration period.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during the breeding bird, spring and fall bird migration periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 5 suitable habitat features (18.0 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4 suitable habitat features (34.6 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4 suitable habitat features (33.5 ha).</li> </ul>
Waterfowl	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally).</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of confirmed and suitable habitat features disturbed (e.g., stopover sites).<sup>3,4,5</sup></li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable bird nesting habitat during the breeding bird period.</li> <li>Avoid clearing within 100 m of suitable stopover sites during the spring and fall bird migration period.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during the breeding bird, spring and fall bird migration periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 5 suitable habitat features (60.7 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4 suitable habitat features (137.3 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4 suitable habitat features (141.1 ha).</li> </ul>

**Summary of Birds:**

- Overall
- Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Birds**, as it is anticipated that it would result in the lower net effects on bird SAR, shorebirds, and waterfowl and possibly raptors relative to the other two alternatives.
  - Alternative 4 East is the moderately preferred route alternative for Segment 1 – Ogoki Crossing, as it would result in higher net effects on SAR, Raptors, shorebirds, and waterfowl compared to Alternative 1, but fewer net effects than Alternative 4 West on SAR, and Waterfowl.
  - Alternative 4 West is the least preferred route alternative for Segment 1 – Ogoki Crossing, as it would result the greatest net effects on SAR, raptors, and waterfowl relative to the other two alternatives.

Species at Risk

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Land</b>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for SAR, as it results in the least direct loss of moderate to high suitability habitat for bird SAR.</li> <li>Alternative 4 West is the least preferred for SAR, as it results in the greatest direct loss of moderate to high suitability habitat for bird SAR.</li> <li>Alternative 4 East is the moderately preferred route alternative, as it results in the moderate direct loss of moderate to high suitability habitat for bird SAR.</li> <li>Alternatives 4 East and 4 West both avoid the direct loss of any provincial ESA regulated habitat or federal SARA critical habitat for bird SAR.</li> <li>Alternative 1 results in the direct loss of 7.1 ha of known potential Category 3 eastern-whip-poor-will habitat defined by the Eastern Whip-poor-will GHD as the area of suitable habitat between 170 m and 500 m of the nest or centre of approximated defended territory (MNR, 2013b).<sup>1</sup></li> <li>Alternative 1 minimizes the amount of moderate to high suitability bird SAR habitat that will be removed (avoidance measure).</li> </ul>						
<u>Raptors</u>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Raptors, as it results in no direct loss of raptor nest locations and their associated buffers.</li> <li>Alternative 4 East and 4 West are the least preferred for Raptors, as they result in the greatest direct loss of raptor nest locations and their associated buffers.</li> <li>While Alternative 1 results in a slightly greater direct loss of suitable stopover sites for raptors, alternative suitable stopover habitat is expected to be readily available for raptors in the LSA.</li> <li>Alternative 1 avoids the removal of known raptor nests.</li> <li>Alternatives 4 East and 4 West minimize the area of stopover sites that will be removed (avoidance measure).<sup>2</sup></li> </ul>						
<u>Shorebirds</u>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Shorebirds, as it results in the least direct loss of suitable habitat features for shorebirds (e.g., stopover sites).</li> <li>Alternative 4 East is the least preferred for Shorebirds, as it results in the greatest direct loss of suitable habitat features for shorebirds.</li> <li>Alternative 4 West is the moderately preferred route alternative for Shorebirds, as it results in the moderate direct loss of suitable habitat features for shorebirds.</li> <li>Alternative 1 minimizes the amount of suitable habitat features that will be removed (avoidance measure).<sup>3,4,5</sup></li> </ul>						
<u>Waterfowl</u>						
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Waterfowl, as it results in the least direct loss of suitable habitat features for waterfowl (e.g., stopover sites).</li> <li>Alternative 4 West is the least preferred for Waterfowl, as it results in the greatest direct loss of suitable habitat features for waterfowl.<sup>4</sup></li> <li>Alternative 4 East is the moderately preferred route alternative for Waterfowl, as it results in the moderate direct loss of suitable habitat features for waterfowl.</li> <li>Alternative 1 minimizes the amount of suitable habitat features that will be removed (avoidance measure).<sup>3,4,5</sup></li> </ul>						
<u>Net Effect</u>						
<ul style="list-style-type: none"> <li>Alternative 1 results in lower net effects relative to Alternatives 4 East and 4 West. Comparatively, Alternative 4 East results in moderate net effects and Alternative 4 West results in higher net effects. This comparative analysis evaluated the 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to bird VCs at the local or regional scale (i.e., LSA or RSA). The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the bird VCs will be completed on the preferred route selected and may result in a different determination of predicted net effects to these individual VCs.</li> </ul>						
<b>Notes:</b>						
<ol style="list-style-type: none"> <li>Category 3 eastern whip-poor-will habitat is defined by the Eastern Whip-poor-will GHD as the area of suitable habitat between 170 m and 500 m of the nest or centre of approximated defended territory (MNR 2013b). Confirmed observations of eastern whip-poor-will during the breeding season were considered defended territories.</li> <li>Stopover sites for raptors were defined as waterbodies and watercourses surveyed during baseline field surveys with greater than 2 observations of raptors.</li> <li>The Natural Heritage Information Centre was searched for known provincial waterfowl and shorebird staging areas. No data were found for these measures.</li> <li>Suitable habitat features for shorebirds and waterfowl were defined as waterbodies and watercourses surveyed during baseline field surveys.</li> <li>Confirmed habitat features for shorebirds and waterfowl were defined as waterbodies and watercourses surveyed during baseline field surveys plus a 100 m buffer where shorebirds or waterfowl were observed during baseline field surveys.</li> </ol>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
<b>Acoustic and Vibration Environment</b>						
Acoustic and Vibration Environment	<ul style="list-style-type: none"> <li>Change to noise and vibration</li> </ul>	<ul style="list-style-type: none"> <li>PDA footprint area.</li> <li>Number of sensitive points of reception (PORs) within 500 m of the roadway.</li> <li>Total road length.</li> </ul>	<ul style="list-style-type: none"> <li>Comply with local municipal noise by-laws and the Ministry of the Environment, Conservation and Parks' <i>Model Municipal Noise Control Bylaw</i> (i.e., NPC-115).</li> <li>Generally, limit construction activities to the daytime period (i.e., 07:00 to 19:00) where possible. If nighttime construction activities are required, a review of whether additional mitigation measures are needed should be carried out.</li> <li>Maintain equipment and machinery used on site in good working conditions through regular maintenance and inspection.</li> <li>Design access roads to minimize reversing, which is expected to minimize use of backup beepers, where possible.</li> <li>Locate and operate construction equipment as far as possible from PORs.</li> <li>Notify Indigenous communities, landowners, and relevant stakeholders of the planned construction schedule before the start of construction and prior to specific activities that may be impacted by noise or generate vibration.</li> <li>Investigate noise or vibration concerns as they arise through a complaint resolution mechanism whereby persons can contact the proponent if there are perceived noise or vibration issues.</li> <li>Operate vehicles and equipment such that impulsive noise is minimized, where possible.</li> <li>Develop a construction vibration work plan prior to the start of construction describing the construction schedule, list of construction equipment, list of POR locations, applicable guidance documents including criteria and municipal by-laws (i.e., residential, heritage structures and utilities) and control measures.</li> <li>Avoid operating equipment expected to be a significant source of vibration simultaneously. Vibration levels could be less when operating separately.</li> <li>Construction blasting will be carried out in compliance with OPSS 120 and NPC-119. All blasts which might impact local structures or disrupt humans should be monitored for ground and air vibrations.</li> <li>Aggregate pit blasting will be carried out to comply with the conditions provided in the license or aggregate permit.</li> <li>Blasting delays and blast mats will be used, as appropriate, to control vibration and fly rock as required.</li> </ul>	<ul style="list-style-type: none"> <li>The PDA for this alternative is 1,509 ha, with a total road length of 48.1 km. There are 16 potential PORs within 500 m of the roadway that could be impacted by noise and vibration.</li> </ul>	<ul style="list-style-type: none"> <li>The PDA for this alternative is 3,574 ha, with a total road length of 54.9 km. There are 7 potential PORs within 500 m of the roadway that could be impacted by noise and vibration.</li> </ul>	<ul style="list-style-type: none"> <li>The PDA for this alternative is 5,509 ha, with a total road length of 62.3 km. There are 7 potential PORs within 500 m of the roadway that could be impacted by noise and vibration.</li> </ul>
<b>Summary of Acoustic and Vibration Environment:</b>						
<u>Overall</u>						
<ul style="list-style-type: none"> <li><b>Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of the Acoustic and Vibration Environment</b> as it has the smallest PDA footprint and shortest road length.</li> <li>Alternative 4 West is the least preferred for alternative of Segment 1 – Ogoki Crossing from the perspective of the Acoustic and Vibration Environment as it has the largest PDA footprint and longest road length.</li> <li>Alternative 4 East is the moderately preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of the Acoustic and Vibration Environment as it has a smaller PDA footprint and shorter road length compared to Alternative 4 West but is larger and longer when compared to Alternative 1.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
<ul style="list-style-type: none"> <li>In general, the larger the PDA footprint, the higher the likelihood of a larger number of potential PORs located in the acoustic environment study areas.</li> <li>In general, the longer the road, the higher the likelihood of a larger number of potential PORs exposed to noise from Project operations (i.e., a longer-term effect).</li> <li>In general, the more potential PORs within 500 m of the roadway, the higher the likelihood of a larger number of potential PORs exposed to noise from the Project. Note that the POR counts above are based on a preliminary review and the specific land uses have not been confirmed to be noise or vibration sensitive.</li> <li>Alternative 1 has the smallest PDA footprint and shortest road length. It has a slightly higher number of potential PORs within 500 m of the roadway but due to the low number of identified potential PORs for all alternatives, the PDA footprint and road length were considered for ranking the alternatives.</li> </ul>						
<u>Net Effect</u>						
<ul style="list-style-type: none"> <li>The predicted net effect for each of the alternatives were evaluated as equivalent, based on the understanding that each of the route alternatives would be designed such that the outcome of the acoustic and vibration environment assessment of net effects would be comparatively equal. This comparative analysis evaluated the route alternatives based on the PDAs, road length, and a preliminary analysis of the number of potential PORs within 500 m of the roadway and did not consider the expected Project noise and vibration levels in the LSA or the proximity of potential PORs to the Project. The comprehensive review of potential PORs and assessment of net effects for the acoustic and vibration environment will be completed on the preferred route selected and may result in different determination of predicted net effects.</li> </ul>						
<b>Atmospheric and GHG</b>						
Air Quality and GHG	<ul style="list-style-type: none"> <li>Number of sensitive receptors within 500 m of the roadway.</li> <li>Land use type which is disturbed based on route selection (i.e., wetland, forest type, peatlands).</li> <li>Operating equipment needed for each route selection (if 1 route selection requires increased construction efforts).</li> <li>Overall road / clearing area of each route selection.</li> </ul>	<ul style="list-style-type: none"> <li>Number</li> <li>Bedrock (ha)</li> <li>Treed (ha)</li> <li>Water (ha)</li> <li>Wetland (ha)</li> <li>Length of Road (km)</li> <li>Area (ha)</li> </ul>	<ul style="list-style-type: none"> <li>Air Quality Mitigation Options: <ul style="list-style-type: none"> <li>Maintain and keep equipment in proper working order.</li> <li>Use fuel efficient equipment where possible.</li> <li>Avoid idling where possible and develop an anti-idling policy.</li> <li>Optimize material selection, procurement and shipping.</li> <li>Implement fugitive dust controls such as scheduled road watering, stockpile watering or covering erodible surfaces where appropriate.</li> <li>Implement proper storage and handling procedures of fuel.</li> <li>Optimize blasting and land clearing activities to reduce overall fuel and explosive usage.</li> <li>Where possible reuse or salvage wood materials to prevent burning activities for disposal.</li> </ul> </li> <li>GHG Mitigation Options: <ul style="list-style-type: none"> <li>Maintain and keep equipment in proper working order.</li> <li>Use fuel efficient equipment where possible.</li> <li>Avoid idling where possible and develop an anti-idling policy.</li> <li>Optimize material selection, procurement and shipping.</li> <li>Consider carbon offsets through reforestation.</li> <li>Where possible reduce the amount of land clearing or disturbance activities.</li> <li>Strategically develop construction and equipment usage schedules to reduce overall fuel consumption.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>16</li> <li>-</li> <li>1,171</li> <li>26</li> <li>313</li> <li>48.10</li> <li>1,509.01</li> </ul>	<ul style="list-style-type: none"> <li>7</li> <li>15</li> <li>2,211</li> <li>80</li> <li>1,268</li> <li>54.87</li> <li>3,574.21</li> </ul>	<ul style="list-style-type: none"> <li>7</li> <li>16</li> <li>3,362</li> <li>97</li> <li>2,035</li> <li>61.21</li> <li>5,508.94</li> </ul>
<b>Summary of Atmospheric and GHG:</b>						
<u>Overall</u>						
<ul style="list-style-type: none"> <li><b>Alternative 4 East 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Atmospheric and GHG based on number of sensitive receptors.</b></li> <li>Alternative 1 is preferred over Alternative 4 East and West in terms of having the least amount of overall clearing.</li> <li>Total number of receptors which may be impacted by air quality emissions from the project is lowest for Alternatives 4 East and 4 West. It should be noted that receptor location may influence the magnitude of effects experienced at each receptor.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West	
<b>People</b>							
<ul style="list-style-type: none"> <li>At this time, the potential impacts that carbon sinks and sequestrations will have on overall GHG emissions due to land classification changes is unknown. Based on the data currently available Alternative 1 has the least disturbed area of carbon sinks. Magnitude of loss of carbon sinks will vary based on the specifics of each land use characteristics.</li> <li>Length of road segment is lower for Alternative 1. This may result in a decrease in air quality and GHG emissions during construction phases. Total road length may or may not influence operating equipment duration based on route specific construction requirements.</li> <li>Total area required to be cleared is lowest for Alternative 1. This may result in a temporary decrease in air quality and GHG emissions during construction phases.</li> </ul>							
<i>Net Effects</i>							
<ul style="list-style-type: none"> <li>Net effects on the atmospheric and GHG VC were predicted to be equivalent for all three alternatives. Net effect rating is subject to change pending on detailed modelling / calculations as well as implementation of additional mitigation. This comparative analysis evaluated 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to the air quality and GHG VC at the local or regional scale (i.e., LSA or RSA). The comprehensive assessment of net effects to the air quality and GHG VC will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC.</li> </ul>							
<b>Cultural Heritage</b>							
Archaeological Sites and Resources	Previously identified archaeological sites.	<ul style="list-style-type: none"> <li>The net effects to archaeological resources will be evaluated.</li> </ul> OR <ul style="list-style-type: none"> <li>Number of previously identified archaeological sites.</li> <li>Areas of cultural significance raised by local Indigenous Nations.</li> <li>Number of resources identified.</li> </ul>	Complete all outstanding archaeological assessments.	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>	
	Areas of cultural significance raised by local Indigenous Nations.		<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> <li>Incorporate information received by Indigenous Nations in reporting.</li> <li>Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. In addition, consultation with relevant Indigenous communities will be initiated in the event that archaeological resources or human remains are discovered.</li> </ul>	<ul style="list-style-type: none"> <li>Area has raised cultural significance by local Indigenous Nations.</li> </ul>	<ul style="list-style-type: none"> <li>Area has raised cultural significance by local Indigenous Nations.</li> </ul>	<ul style="list-style-type: none"> <li>Area has raised cultural significance by local Indigenous Nations.</li> </ul>	
			Proximity to water.	<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>
	Soil texture and drainage.			<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>
			Glacial geomorphology, elevated topography	<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>
	Resource areas including food or medicinal plants, scarce raw materials			<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Area has food or medicinal plant resources.</li> </ul>	<ul style="list-style-type: none"> <li>Area has food or medicinal plant resources.</li> </ul>	<ul style="list-style-type: none"> <li>Area has food or medicinal plant resources.</li> </ul>
			Areas of early 19th century settlement and transportation routes.	<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative, Ogoki River is a significant potable water source.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative, Ogoki River is a significant potable water source.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative, Ogoki River is a significant potable water source.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>	

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West	
<b>People</b>							
	<ul style="list-style-type: none"> <li>Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants</li> </ul>		<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative, Ogoki River is a significant potable water source.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative, Ogoki River is a significant potable water source.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative, Ogoki River is a significant potable water source.</li> </ul>	
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>	
Built Heritage Resources / Cultural Heritage Landscapes	<ul style="list-style-type: none"> <li>Harvest Areas (MFFN)</li> </ul>	<ul style="list-style-type: none"> <li>The net effects to build heritage resources and cultural heritage landscapes will be evaluated in the Cultural Heritage Report.</li> <li>Number of resources identified.</li> </ul>	<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Animal, Fish and Plant Harvest Areas.</li> <li>If direct adverse impacts are anticipated to an Animal, Fish, and Plant Harvest Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 25 identified Animal, Fish, and Plant Harvest Areas.</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 25 identified Animal, Fish, and Plant Harvest Areas.</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 30 identified Animal, Fish, and Plant Harvest Areas.</li> </ul>	
					<b>HIGH RESIDUAL EFFECT Most Preferred</b>	<b>HIGH RESIDUAL EFFECT Most Preferred</b>	<b>HIGH RESIDUAL EFFECT Least Preferred</b>
	<ul style="list-style-type: none"> <li>Cultural, Spiritual, and Sacred Areas (MFFN)</li> </ul>		<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Cultural, Spiritual, and Sacred Areas.</li> <li>If direct adverse impacts are anticipated to a Cultural, Spiritual, and Sacred Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 10 identified Cultural, Spiritual, and Sacred Areas.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to impact any identified Cultural, Spiritual, or Sacred Areas.</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 5 identified Cultural, Spiritual, and Sacred Areas.</li> </ul>	
					<b>LOW RESIDUAL EFFECT Least Preferred</b>	<b>NEGLIGIBLE RESIDUAL EFFECT Most Preferred</b>	<b>LOW RESIDUAL EFFECT Moderately Preferred</b>
	<ul style="list-style-type: none"> <li>Habitation Areas (MFFN)</li> </ul>		<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Habitation Areas.</li> <li>If direct adverse impacts are anticipated to a Habitation Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 20 identified Habitation Areas.</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 20 identified Habitation Areas.</li> </ul>	<ul style="list-style-type: none"> <li>Residual effects for this alternative include the potential impact of up to 25 identified Habitation Areas.</li> </ul>	
				<b>MODERATE RESIDUAL EFFECT Most Preferred</b>	<b>MODERATE RESIDUAL EFFECT Most Preferred</b>	<b>HIGH RESIDUAL EFFECT Least Preferred</b>	
	<ul style="list-style-type: none"> <li>Travel Routes (MFFN and Historical Maps)</li> </ul>		<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Travel Areas.</li> <li>If direct adverse impacts are anticipated to a Travel Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to impact any identified Historical Indigenous Trails or Portage Routes</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to impact any identified Historical Indigenous Trails or Portage Routes</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to impact any identified Historical Indigenous Trails or Portage Routes</li> </ul>	
				<b>NEGLIGIBLE RESIDUAL EFFECT No discernable difference</b>	<b>NEGLIGIBLE RESIDUAL EFFECT No discernable difference</b>	<b>NEGLIGIBLE RESIDUAL EFFECT No discernable difference</b>	

**Summary of Cultural Heritage:**

Overall

- Alternative 4 East is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Cultural Heritage due to its lower net effect on identified cultural heritage resources.
- All alternatives have the potential to impact identified cultural heritage resources.
- For consistency the Cultural Heritage indicators have been revised from those presented in the Study Plan to be consistent with the Indigenous Knowledge data points used to develop the cultural heritage themes for the Cultural Heritage Report.

Net Effects

- The predicted net effects were evaluated as equivalent for all three alternatives due to their effects on areas of raised cultural significance by local Indigenous nations, archaeological potential present, food / medicinal plant resources, Ogoki River as a potable water source, disturbance of Harvest Areas, and disturbance of Habitation Areas. The predicted net effects have not considered all potential mitigation that may be applied. Net effect assessment is subject to change based on the implementation of additional mitigation. This comparative analysis evaluated 3 route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to the cultural heritage VC at the local or regional scale (i.e., LSA or RSA). The comprehensive assessment of net effects to the cultural heritage VC will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC.
- The net effects assessment for Cultural Heritage employs its own, discipline-relevant methodology which only uses data relevant for cultural heritage purposes, and not the full data set used in this table. Any apparent discrepancies in the data are therefore methodological in origin and are confined to the Cultural Heritage report (a more detailed explanation is in the draft Cultural Heritage Report: Existing Conditions & Preliminary Impact Assessment). To illustrate cultural heritage themes, a series of heat maps were created using the Indigenous Knowledge categories obtained from MFFN, in addition to potential Cultural Heritage Resources identified during the cultural heritage field review and a historic mapping review. The cultural heritage data set therefore differs in some areas from the data set from originally collected by Dillon. To generate the heat maps, a 5 km square grid was applied across the LSA, and colour coded to illustrate data point concentrations and areas of interest in proximity to the Route Alternatives for the Project. Data points were included according to the 5 km grid, not just the LSA. The heat maps depict Indigenous Knowledge data point frequency in numerical ranges of 5 (e.g., 0-5, 6-10, 11-15), with each range represented in a

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
different colour. The cultural heritage assessment of potential impacts for each alternative was based on the maximum potential impacts as depicted on the heat maps rather than a precise account of individual data points. Neither did the cultural heritage assessment differentiate between direct or indirect impacts, but broadly screened for any potential impacts along the route alternatives. The cultural heritage impact assessment for the preferred route includes a more precise treatment of the relevant data, excluding data points outside the LSA and assessing direct versus indirect impacts within the LSA.						
<b>Visual</b>						
Visual	<ul style="list-style-type: none"> <li>Change in landscape character.</li> </ul>	<ul style="list-style-type: none"> <li>Visibility of project from identified valued / sensitive receptor locations (Ogoki River).</li> <li>Change in landscape character will result in the change / impact to the existing visual environment.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize disturbance to the surrounding landscape including Peatland, Vegetation, Terrain, and Surface Water.</li> <li>Minimize the creation on open vistas to reduce visibility of proposed community access road.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction.</li> </ul>	<ul style="list-style-type: none"> <li>Crosses at a narrow portion of the Ogoki River (2 x 70 m crossings).</li> <li>See below anticipated impacts to changes in landscape character and visual environment.</li> </ul>	<ul style="list-style-type: none"> <li>Traverses Ogoki River (1 x 300 m crossing).</li> <li>See below anticipated impacts to changes in landscape character and visual environment.</li> </ul>	<ul style="list-style-type: none"> <li>Traverses Ogoki River (1 x 120 m crossing).</li> <li>See below anticipated impacts to changes in landscape character and visual environment.</li> </ul>
	<ul style="list-style-type: none"> <li>Proximity to and number of sensitive sites.</li> </ul>	<ul style="list-style-type: none"> <li>Alteration / change in or loss of culturally important sites and areas (e.g., ceremonial sites, place names, teaching sites, archaeological sites).</li> <li>Visibility of Cultural, Spiritual, and Sacred Areas (MFFN).</li> </ul>	<ul style="list-style-type: none"> <li>Avoid and / or screen sensitive sites and features.</li> <li>Minimize disturbance and proximity of road to sensitive receptors including known cultural and spiritual significant places.</li> </ul>	<ul style="list-style-type: none"> <li>Requires Indigenous Knowledge Team Input and CH Team Input.</li> </ul>	<ul style="list-style-type: none"> <li>Requires Indigenous Knowledge Team Input and CH Team Input.</li> </ul>	<ul style="list-style-type: none"> <li>Requires Indigenous Knowledge Team Input and CH Team Input.</li> </ul>
	<ul style="list-style-type: none"> <li>Degree of Visual Contrast.</li> </ul>	<ul style="list-style-type: none"> <li>Amount of visual disturbance.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize disturbance and extent of infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>Requires visibility mapping / modelling.</li> </ul>	<ul style="list-style-type: none"> <li>Requires visibility mapping / modelling.</li> </ul>	<ul style="list-style-type: none"> <li>Requires visibility mapping / modelling.</li> </ul>
	<ul style="list-style-type: none"> <li>Change in Landscape Character: Surface Water Features.</li> </ul>	<ul style="list-style-type: none"> <li>Significant bridge crossings that will need to be installed over water crossing and alter landscape as well as visual environment.</li> <li>Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features (e.g., traditional land uses).</li> </ul>	<ul style="list-style-type: none"> <li>Minimize bridge crossings that will span greater distances as it will have the greatest amount of visual impact.</li> <li>Minimize the amount of bridge crossings needed that will be seen from potential sensitive receptors.</li> <li>Strategically locate bridge crossings within forested areas or visually screen with forest canopy.</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated impacts to landscape character: <ul style="list-style-type: none"> <li>Cross 16 waterbodies, all of which are inferred as permanent.</li> <li>Cross 12 waterbodies (25,091 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work.</li> <li>Cross 6 waterbodies (22,927 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Anticipated impacts to landscape character: <ul style="list-style-type: none"> <li>Cross 18 waterbodies, all of which are inferred as permanent.</li> <li>Cross 9 waterbodies (31,945 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work.</li> <li>Cross 3 waterbodies (30,810 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Anticipated impacts to landscape character: <ul style="list-style-type: none"> <li>Cross 18 waterbodies, all of which are inferred as permanent.</li> <li>Cross 11 waterbodies (11,045 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work.</li> <li>Cross 5 waterbodies (9,010 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
	<ul style="list-style-type: none"> <li>Change in Landscape Character: Vegetation and Ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>Area of wetland, riparian and upland ecosystems disturbed, altering the visual environment.</li> <li>Area of wetland, riparian and upland ecosystems disturbed, affecting traditional land uses.</li> <li>Visual alternation of cultural and spiritual significant places.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize disturbance of existing vegetation and various ecosystems which will alter the visual environment.</li> <li>Consult with Indigenous communities of any disturbed sites and land uses that may be visually impacted by the community access road.</li> <li>Implement reclamation, revegetation and compensation practices of disturbed areas after the construction of the community access road.</li> <li>Strategically locate road within forested areas to visually mitigate views of the community access road and minimize open areas and upland areas that have greater visual impact.</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated impacts to landscape character: <ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 21 upland ecosite types.</li> <li>This alternative is anticipated to disturb 598.72 ha of wetland and riparian ecosystems.</li> </ul> </li> <li>This alternative is anticipated to disturb 541.59 ha of peatland and 14 peatland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated impacts to landscape character: <ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 27 upland ecosite types.</li> <li>This alternative is anticipated to disturb 1,372.56 ha of wetland and riparian ecosystems.</li> </ul> </li> <li>This alternative is anticipated to disturb 1,126.20 ha of peatland and 15 peatland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated impacts to landscape character: <ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 31 upland ecosite types</li> <li>This alternative is anticipated to disturb 2,253.64 ha of wetland and riparian ecosystems.</li> </ul> </li> <li>This alternative is anticipated to disturb 1,735.73 ha of peatland and 18 peatland ecosite types.</li> </ul>
<b>Summary of Visual:</b>						
<i>Overall</i>						
<ul style="list-style-type: none"> <li><b>Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Visual.</b> <ul style="list-style-type: none"> <li>Alternative 1 crosses the Ogoki River at 2 locations, but they are both narrow at 70 m, therefore having a lower visual impact.</li> <li>Alternative 1 demonstrates a moderately higher concentration of significant Indigenous locations compared to Alternative 4.</li> </ul> </li> <li>Alternative 4 East is the least preferred alternative for Segment 1 – Ogoki Crossing from the perspective of Visual. <ul style="list-style-type: none"> <li>Both Alternative 4 East and 4 West traverse the significant Ogoki River at wider sections (120 m and 300 m), resulting in a higher impact on the visual environment.</li> <li>Alternatives 4 East and 4 West would need a bridge to span a longer distance creating a higher visual impact.</li> </ul> </li> <li>Alternative 4 West is the moderately preferred alternative for Segment 1 – Ogoki Crossing from the perspective of Visual. <ul style="list-style-type: none"> <li>Alternative 4 West is shown to be located on more favourable terrain (Sand and Gravel), in terms of construction, but is also the longest route.</li> <li>Alternative 4 West is showed to have greater impact to existing wetland ecosystems.</li> <li>The difference between alternative routes 4 East and 4 West is negligible.</li> </ul> </li> <li>Any segments with more wooded terrain have fewer visual impacts.</li> </ul>						
<i>Net Effect</i>						
<ul style="list-style-type: none"> <li>Implementation of the community access road will alter the existing landscape character, and as a result alter the visual environment. Degree of visual contrast and affected sensitive receptors will be determined with visibility mapping / modelling. Based on anticipated change in landscape character of surface water features, Alternative 1 results in the lowest net effects while Alternative 4 West results in the highest net effects. Based on anticipated changes to vegetation and ecosystems, Alternative 1 results in the lowest net effects while Alternative 4 West results in the highest net effects, given the data available to date.</li> </ul>						
<b>Human Health and Community Safety</b>						
Public Safety	<ul style="list-style-type: none"> <li>Road Use Accident.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for roadway related accidents as a result of the road project including vehicles and pedestrians.</li> </ul>	<ul style="list-style-type: none"> <li>Post “no entry”, warning signs and barricades (e.g., gates, fences), where necessary, around active construction sites; warning signs and reduced speed limits to be established at known wildlife crossing locations; warning signs and lights to be displayed for road maintenance equipment and trail crossings.</li> <li>Provide for safe access for trappers and other traditional users.</li> </ul>	<ul style="list-style-type: none"> <li>The development and use of the road has the potential to result in net effects to public safety including road related accidents. All route segments are considered to have relatively equal potential for accidents.</li> </ul>	<ul style="list-style-type: none"> <li>The development and use of the road has the potential to result in net effects to public safety including road related accidents. All route segments are considered to have relatively equal potential for accidents.</li> </ul>	<ul style="list-style-type: none"> <li>The development and use of the road has the potential to result in net effects to public safety including road related accidents. All route segments are considered to have relatively equal potential for accidents.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>
Environmental Factors Influencing Human Health and Community Safety	<ul style="list-style-type: none"> <li>Country Foods.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for change in the quality and quantity (abundance) of country foods.</li> </ul>	<ul style="list-style-type: none"> <li>Reclaim and rehabilitate areas disturbed by construction to encourage natural regeneration / regrowth of vegetation and habitat restoration.</li> <li>Community input into alignment routing, component siting and road design avoid important areas of botanical</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road has the potential to result in net effects to the abundance of harvested species which could impact country food consumption by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road has the potential to result in net effects to the abundance of harvested species which could impact country food consumption by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road has the potential to result in net effects to the abundance of harvested species which could impact country food consumption by Indigenous communities.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
			and wildlife resources that serve as country foods to the extent feasible.	<ul style="list-style-type: none"> <li>Moose is understood to be an important species that is harvested by First Nations. The PDA for this segment contains 503 ha of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>It is unknown if Caribou is currently harvested in the LSA and therefore is not considered in this evaluation in regard to country foods.</li> <li>All route segments cross a similar number of watercourses involving in-water works and is expected to have similar impact on fish that may be harvested.</li> <li>Information on how the quality of harvested species could be affected by the road is not known at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Moose is understood to be an important species that is harvested by First Nations. The PDA for this segment contains 410 ha of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>It is unknown if Caribou is currently harvested in the LSA and therefore is not considered in this evaluation in regard to country foods.</li> <li>All route segments cross a similar number of watercourses involving in-water works and is expected to have similar impact on fish that may be harvested.</li> <li>Information on how the quality of harvested species could be affected by the road is not known at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Moose is understood to be an important species that is harvested by First Nations. The PDA for this segment contains 820 ha of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>It is unknown if Caribou is currently harvested in the LSA and therefore is not considered in this evaluation in regard to country foods.</li> <li>All route segments cross a similar number of watercourses involving in-water works and is expected to have similar impact on fish that may be harvested.</li> <li>Information on how the quality of harvested species could be affected by the road is not known at this time and will be assessed as part of the project impact assessment.</li> </ul>
				<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Moderately Preferred</b>
<b>Summary of Human Health and Community Safety:</b>						
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 1 and Alternative 4 East are the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Human Health and Community Safety.</b></li> <li>Alternative 1 and Alternative 4 East result in less impacts to moose habitat, and moose is an important country food source for local Indigenous communities.</li> <li>All route segments will provide connection to the Marten Falls community and result in the same health impacts to the community including for example access to health services, changes to social and economic structures, and mental well-being.</li> <li>Generally, potential effects to the human health and community safety at the local or regional scale is considered similar for all the alternative routes.</li> <li>Only 2 human health and community safety indicators were considered to have relevance considering the character of the study area and data availability: country foods and road use accidents.</li> <li>All route segments are considered equal with respect to impacts on Indigenous women including human trafficking.</li> <li>There are no permanent places of residences in proximity to the route segments that could be impacted in noise and air quality changes that might result in health impacts.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>Alternative 4 West results in higher net effects to country food availability due to greater moose habitat effects than Alternative 1 and Alternative 4 East. No information is currently available regarding the potential impact on the quality of harvested species. This will be considered in the assessment of impacts of the project. A comprehensive assessment of net effects to human health and community safety will be completed on the preferred route and may result in a different determination of predicted net effects to the VC.</li> </ul>						
<b>Social</b>						
<b>Summary of Social:</b>						
<ul style="list-style-type: none"> <li>All route alternatives for Segment 1 – Ogoki Crossing are considered equal from a Social-Community perspective. The difference between all three alternatives is negligible.</li> <li>All route segments will provide connection to the Marten Falls community and provide the same expected net social impact to the community.</li> <li>Social-community impacts from the Community Access Road are anticipated to be focused on the communities located with the LSA including MFFN, Aroland First Nation, and Greenstone.</li> <li>The potential for social impacts (e.g., change in housing demand / supply, community well-being) is expected to be the same in all the LSA communities for all route alternatives.</li> <li>No specific social-community features (e.g., permanent dwellings) were identified in proximity to the alternative route segments that could be impacted.</li> <li>See Aboriginal and Treaty Rights and Interests for identification of features identified through the Indigenous Knowledge collection program.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
<b>Land and Resource Use</b>						
Land Use Compatibility	<ul style="list-style-type: none"> <li>Binary alignment with established planning policy requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Description of applicable land use policies / designations.</li> </ul>	<ul style="list-style-type: none"> <li>No applicable measures due to absence of land use designations.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative route segments do not pass through any lands with land use designations. All route segments are on crown owned lands and are subject to the same provincial policies.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative route segments do not pass through any lands with land use designations. All route segments are on crown owned lands and are subject to the same provincial policies.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative route segments do not pass through any lands with land use designations. All route segments are on crown owned lands and are subject to the same provincial policies.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>
Parks and Protected Areas	<ul style="list-style-type: none"> <li>Number and area of parks and protected areas impacted.</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of Park and Protected area with natural, cultural or recreation values impacted.</li> </ul>	<ul style="list-style-type: none"> <li>Limit clearing and use of land within parks and protected lands as much as possible. Temporary work areas such as staging areas should be located outside of parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could result in net effects including the loss of designated parkland area and disturb use of adjacent parkland.</li> <li>This segment crosses near the eastern end of Ogoki River Provincial Park. As such it is considered to have the lowest impact on parks and protected areas among the alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could result in net effects including the loss of designated parkland area and disturb use of adjacent parkland.</li> <li>This segment crosses into the Ogoki River Provincial Park and impacts 135.31 ha of park land.</li> <li>Lower impact on parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could result in net effects including the loss of designated parkland area and disturb use of adjacent parkland.</li> <li>This segment crosses into Ogoki River Provincial Park and impacts 141.1 ha of park land.</li> <li>Greatest relative impact on parks and protected areas.</li> </ul>
	<ul style="list-style-type: none"> <li>Accessibility to parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>Extent to which access to parks and protected areas is increased.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor and limit the development of any side trails / roads that might extend into parks and protected areas.</li> <li>Work with Ontario Parks regarding any measures to control access into parks and protected areas as applicable.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could have net effects that change access levels to existing parks. The net effects of this are dependent on the proximity of the road to the park and nature of the park.</li> <li>This segment would provide less new access to Ogoki River Provincial Park which is a remote waterway park, as it passes just to the east of the park.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could have net effects that change access levels to existing parks. The net effects of this are dependent on the proximity of the road to the park and nature of the park.</li> <li>This segment would provide new access to Ogoki River Provincial Park which is a remote waterway park. Road access would contribute to a change in the character of this park.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could have net effects that change access levels to existing parks. The net effects of this are dependent on the proximity of the road to the park and nature of the park.</li> <li>This segment would provide new access to Ogoki River Provincial Park which is a remote waterway park. Road access would contribute to a change in the character of this park.</li> </ul>
				<b>Most Preferred</b>	<b>Moderately Preferred</b>	<b>Least Preferred</b>
Recreation and Tourism	<ul style="list-style-type: none"> <li>Accessibility to lands and waterways used for recreation and tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Change to access to land utilized for recreation and / or tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a land / waterbody access plan to determine need for any access restrictions and / or access enhancements to promote recreation and tourism in the area.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access levels to current remote lands and water resources that could provide new recreation and tourism opportunities.</li> <li>All segments provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route segment are not considered to have more recreation value than other route segments. No information has been shared by stakeholders to suggest otherwise.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access levels to current remote lands and water resources that could provide new recreation and tourism opportunities.</li> <li>All segments provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route segment are not considered to have more recreation value than other route segments. No information has been shared by stakeholders to suggest otherwise.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access levels to current remote lands and water resources that could provide new recreation and tourism opportunities.</li> <li>All segments provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route segment are not considered to have more recreation value than other route segments. No information has been shared by stakeholders to suggest otherwise.</li> </ul>
				<b>Most Preferred</b>	<b>Moderately Preferred</b>	<b>Moderately Preferred</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
				<ul style="list-style-type: none"> <li>Recreational users (e.g., snowmobilers, hunters, canoe / kayak users) would benefit from greater access to previously inaccessible lands.</li> </ul>	<ul style="list-style-type: none"> <li>Recreational users (e.g., snowmobilers, hunters, canoe / kayak users) would benefit from greater access to previously inaccessible lands.</li> </ul>	<ul style="list-style-type: none"> <li>Recreational users (e.g., snowmobilers, hunters, canoe / kayak users) would benefit from greater access to previously inaccessible lands.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>
		<ul style="list-style-type: none"> <li>Change in waterway navigability including for recreation and tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Navigable waterway crossings will be designed to not inhibit navigation</li> <li>Navigation to be maintained during construction</li> </ul>	<ul style="list-style-type: none"> <li>The development of bridges over watercourses could negatively affect navigation.</li> <li>All segments cross a similar number of waterbodies (17-18).</li> </ul>	<ul style="list-style-type: none"> <li>The development of bridges over watercourses could negatively affect navigation.</li> <li>All segments cross a similar number of waterbodies (17-18).</li> </ul>	<ul style="list-style-type: none"> <li>The development of bridges over watercourses could negatively affect navigation.</li> <li>All segments cross a similar number of waterbodies (17-18).</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>
	Environmental conditions.	<ul style="list-style-type: none"> <li>Change in environmental conditions that could change attractiveness of the area for tourism and recreation.</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include:</li> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Measures to avoid unnecessary vehicle and machine idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas a minimum of 30 m from waterbodies.</li> <li>Wash water from vehicles and equipment will not be allowed to enter a waterbody and will be conveyed to areas for infiltration, treated prior to discharge to the receiving environment, or hauled off-site.</li> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>The road development and its operation could result in disturbance net effects such as runoff that could negatively affect the quality of the adjacent environment and affect its attractiveness for recreation.</li> <li>All segments are expected to result in similar change to environmental conditions that could result in effects to lands used for recreation.</li> </ul>	<ul style="list-style-type: none"> <li>The road development and its operation could result in disturbance net effects such as runoff that could negatively affect the quality of the adjacent environment and affect its attractiveness for recreation.</li> <li>All segments are expected to result in similar change to environmental conditions that could result in effects to lands used for recreation.</li> </ul>	<ul style="list-style-type: none"> <li>The road development and its operation could result in disturbance net effects such as runoff that could negatively affect the quality of the adjacent environment and affect its attractiveness for recreation.</li> <li>All segments are expected to result in similar change to environmental conditions that could result in effects to lands used for recreation.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
	<ul style="list-style-type: none"> <li>Availability of species (fish and wildlife) harvested for recreation purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Change to target species populations harvested for recreation purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Design mitigation measures for habitat and safety will be applied.</li> <li>Setback of all-season road from rivers.</li> <li>Limiting construction to work areas.</li> <li>Measures to protect wildlife will minimize adverse effects to hunting success. Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to in-water work timing windows.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Adherence to DFO's <i>Measures to Protect Fish and Fish Habitat</i> (DFO, 2023).</li> <li>Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>Measures to avoid unnecessary idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Measures to limit the spread and / or introduction of invasive species.</li> </ul> </li> <li>Develop a land / waterbody access plan to determine need for any access restrictions.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could have net effects that change the abundance of species that are harvested for recreation.</li> <li>The natural science team is not able to provide an estimation regarding the extent to which the populations of species harvested might change. Change to their habitat is used as a surrogate measurement – see indicator below.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could have net effects that change the abundance of species that are harvested for recreation.</li> <li>The natural science team is not able to provide an estimation regarding the extent to which the populations of species harvested might change. Change to their habitat is used as a surrogate measurement – see indicator below.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could have net effects that change the abundance of species that are harvested for recreation.</li> <li>The natural science team is not able to provide an estimation regarding the extent to which the populations of species harvested might change. Change to their habitat is used as a surrogate measurement – see indicator below.</li> </ul>
		<ul style="list-style-type: none"> <li>Change to the habitat for these target species.</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to in-water work timing windows.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Adherence to DFO's <i>Measures to Protect Fish and Fish Habitat</i> (DFO, 2023).</li> <li>Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could remove habitat of key valued species could reduce the abundance of these species for recreation harvesting.</li> <li>Moose is a key wildlife species that is recreationally hunted. The PDA for this segment contains 503 ha of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>All route segments cross a similar number of water crossings involving in-water works and is expected to have similar impact on fish that may be harvested.</li> <li>Higher net effects (due to moose habitat effects).</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could remove habitat of key valued species could reduce the abundance of these species for recreation harvesting.</li> <li>Moose is a key wildlife species that is recreationally hunted. The PDA for this segment contains 410 ha of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>All route segments cross a similar number of water crossings involving in-water works and is expected to have similar impact on fish that may be harvested.</li> <li>Lowest net effects (due to moose habitat effects).</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could remove habitat of key valued species could reduce the abundance of these species for recreation harvesting.</li> <li>Moose is a key wildlife species that is recreationally hunted. The PDA for this segment contains 820 ha of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>All route segments crossing a similar number of water crossings involving in-water works and is expected to have similar impact on fish that may be harvested.</li> <li>Highest net effects (due to moose habitat effects).</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
			<ul style="list-style-type: none"> <li>Measures to avoid unnecessary idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Measures to limit the spread and / or introduction of invasive species.</li> <li>Develop a land / waterbody access plan to determine need for any access restrictions.</li> </ul>	<b>Moderately Preferred</b>	<b>Most Preferred</b>	<b>Least Preferred</b>
Extractive Industry	Removal of lands with potential for mineral extraction.	Area of land under mineral claim that the road segments pass through.	Engage with land claim holders in the road design stage to determine how impacts to mineral deposits can be minimized and / or access to mineral areas enhanced.	<ul style="list-style-type: none"> <li>The development of the road could remove mineral resource areas from being extracted in the future.</li> <li>This segment: <ul style="list-style-type: none"> <li>Has 572.5 ha of operational claims within the PDA.</li> <li>Has 117.21 ha of aggregate sites within the PDA.</li> </ul> </li> <li>The extent of the removal of mining claims area from road development will be less than the above noted and determined when the road alignment is confirmed.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could remove mineral resource areas from being extracted in the future.</li> <li>This segment: <ul style="list-style-type: none"> <li>Has 119.51 ha of operational claims within the PDA.</li> <li>Has 69.60 ha of aggregate sites within the PDA.</li> </ul> </li> <li>The extent of the removal of mining claims area from road development will be less than the above noted and determined when the road alignment is confirmed.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could remove mineral resource areas from being extracted in the future.</li> <li>This segment: <ul style="list-style-type: none"> <li>Has 119.51 ha of operational claims within the PDA.</li> <li>Has 69.60 ha of aggregate sites within the PDA.</li> </ul> </li> <li>The extent of the removal of mining claims area from road development will be less than the above noted and determined when the road alignment is confirmed.</li> </ul>
	Proximity to and access to lands with future potential for mining development.	Change to access to lands with future potential for mineral extraction.	Engage with land claim holders in the road design stage to determine how impacts to mineral deposits can be minimized and / or access to mineral areas enhanced.	<ul style="list-style-type: none"> <li>The development of the road could improve access to mineral resource areas and therefore potentially resulting in their development for economic benefit to the region and local communities.</li> <li>This route segment's alignment provides 1.28 km of access into potential future aggregate sites. Moderate change in access to lands with future potential for mineral extraction.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access to mineral resource areas and therefore potentially resulting in their development for economic benefit to the region and local communities.</li> <li>This route segment's alignment provides 3.16 km of access into potential future aggregate sites. Greatest change in access to lands with future potential for mineral extraction.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access to mineral resource areas and therefore potentially resulting in their development for economic benefit to the region and local communities.</li> <li>This route segment's alignment provides 3.16 km of access into potential future aggregate sites. Lowest change in access to lands with future potential for mineral extraction.</li> </ul>
Forestry Industry	Removal of commercial forestry lands.	Area of commercial forestry land that the road segments pass through.	No measures because there are no impacts to commercial forestry lands.	<ul style="list-style-type: none"> <li>The development of the road could result in the removal of forested lands that are commercially harvested.</li> <li>This segment impacts no area of commercial forestry land. All route segments have no impact on removal of commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the removal of forested lands that are commercially harvested.</li> <li>This segment impacts no area of commercial forestry land. All route segments have no impact on removal of commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the removal of forested lands that are commercially harvested.</li> <li>This segment impacts no area of commercial forestry land. All route segments have no impact on removal of commercial forestry lands.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
	<ul style="list-style-type: none"> <li>Proximity to and access to lands with potential for forest harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Change to access to forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>Engage with forestry companies during road design stage regarding access to potential new forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could provide access to lands with timber that could be harvested for economic benefit to the region and local communities.</li> <li>This segment impacts no area of commercial forestry land. However, this segment runs through an area to the west of the Ogoki Forest Forest Management Plan not currently associated with any Forestry Management Unit, providing access to potential new forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could provide access to lands with timber that could be harvested for economic benefit to the region and local communities.</li> <li>This segment impacts no area of commercial forestry land. However, this segment has moderate proximity to the Ogoki Forest FMP area, and could be utilized for access at a future date.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could provide access to lands with timber that could be harvested for economic benefit to the region and local communities.</li> <li>This segment impacts no area of commercial forestry land. However, this segment is greatest in proximity to the Ogoki Forest FMP area, and could be utilized for access at a future date.</li> </ul>
				<b>Most Preferred</b>	<b>Moderately Preferred</b>	<b>Moderately Preferred</b>
Remote Outfitters	<ul style="list-style-type: none"> <li>Change to operations of remote outfitters in vicinity of road routes.</li> </ul>	<ul style="list-style-type: none"> <li>Number and proximity of remote outfitters to the alternatives.</li> <li>Potential for impact to the outfitters from the alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>During final road alignment selection and road design phase consider proximity of remote tourism outfitters to maximize separation distance.</li> <li>Engage with tourism outfitters during road design phase.</li> <li>If applicable, provide compensation to any outfitters displaced or who can no longer operate because of the road.</li> <li>Develop a land / waterbody access plan to determine need for any access restrictions and / or access enhancements to protect remote tourism operations.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could mean that lands and waterbodies are more accessible to the public and decrease the attractiveness of the area for remote tourism operations.</li> <li>This segment may result in increased access to 1 remote tourism outfitter camp location that is located within 5 km of the PDA centreline. Increased levels of access to camp locations could have a negative effect as tourism operators could see decreased value from these camp locations and may experience a decrease in species populations recreationally hunted and fished for.</li> <li>These camp locations could also experience noise effects from road construction and operations which could detract from the user experience and make these camps less attractive to the outfitter.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could mean that lands and waterbodies are more accessible to the public and decrease the attractiveness of the area for remote tourism operations.</li> <li>This segment may result in increased access to 2 remote tourism camp outfitter locations that are located within 5 km of the PDA centreline. One of the camp locations is within 3 km of the route. Increased levels of access to camp locations could have a negative effect as tourism operators could see decreased value from these camp locations and may experience a decrease in species populations recreationally hunted and fished for.</li> <li>These camp locations could also experience noise effects from road construction and operations which could detract from the user experience and make these camps less attractive to the outfitter.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could mean that lands and waterbodies are more accessible to the public and decrease the attractiveness of the area for remote tourism operations.</li> <li>This segment may result in increased access to 2 remote tourism camp outfitter locations that are located within 5 km of the PDA centreline. Increased levels of access to camp locations could have a negative effect as tourism operators could see a decreased value from these camp locations and may experience a decrease in species populations recreationally hunted and fished for.</li> <li>These camp locations could also experience noise effects from road construction and operations which could detract from the user experience and make these camps less attractive to the outfitter.</li> </ul>
				<b>Most Preferred</b>	<b>Least Preferred</b>	<b>Moderately Preferred</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
Trapping	<ul style="list-style-type: none"> <li>Change to trapping activity in vicinity of alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>Length of route passing through trap lines / number of trap lines affected.</li> <li>Potential for change in populations of harvested furbearing species.</li> <li>Change in access to lands for trapping.</li> </ul>	<ul style="list-style-type: none"> <li>Provide community updates regarding the location and timing of Construction noise activities.</li> <li>In selection of final road alignment and road design development, where possible, avoid high-quality furbearing species habitat.</li> <li>Engage with trappers regarding need for access related mitigation and or enhancements to improve access for trappers.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the loss of furbearer habitat therefore decreasing the populations of these species for harvesting. Alternatively, the road could improve access to lands that trappers could take advantage of.</li> <li>This segment: <ul style="list-style-type: none"> <li>Has a length of 48.10 km passing through trapline areas.</li> <li>Intersects 3 trapline areas.</li> <li>Has 1,509.01 ha of trapline area within the PDA.</li> </ul> </li> <li>Would result in the least impact on American marten and wolverine habitat.</li> <li>All route segments provide increased access to trapline areas.</li> <li>Route passes through the greatest amount of trap line area but passes through the least amount of important furbearer habitat and is therefore ranked preferred.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the loss of furbearer habitat therefore decreasing the populations of these species for harvesting. Alternatively, the road could improve access to lands that trappers could take advantage of.</li> <li>This segment: <ul style="list-style-type: none"> <li>Has a length of 39.87 km passing through trapline areas.</li> <li>Intersects 3 trapline areas.</li> <li>Has 2,847.74 ha of trapline area within the PDA.</li> </ul> </li> <li>Would result in a moderate impact on American marten and wolverine habitat.</li> <li>All route segments provide increased access to trapline areas.</li> <li>Route passes through a moderate amount of trap line area and passes through a moderate amount of important furbearer habitat and is therefore ranked second preferred.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the loss of furbearer habitat therefore decreasing the populations of these species for harvesting. Alternatively, the road could improve access to lands that trappers could take advantage of.</li> <li>This segment: <ul style="list-style-type: none"> <li>Has a length of 27.50 km passing through trapline areas.</li> <li>Intersects 2 trapline areas.</li> <li>Has 150.0 ha of trapline area within the PDA.</li> </ul> </li> <li>Would result in the relative highest impact on American marten and wolverine habitat.</li> <li>All route segments provide increased access to trapline areas.</li> <li>While the route passes through the least length of trapline areas, it passes through the greatest amount of important furbearer habitat and is therefore ranked third.</li> </ul>
				<b>Most Preferred</b>	<b>Moderately Preferred</b>	<b>Least Preferred</b>

**Summary of Land and Resource Use:**

Overall

- Alternative 1 is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Land and Resource Use, as it has the lowest potential for impacts on parks, remote outfitters and trapping and provides the best improved access to future forestry lands. Its only notable disadvantage is that it crosses the greatest amount of mineral resource area although it is expected that this can be mitigated through final alignment planning and working with mineral claim holders.
- Alternatives 4 East and 4 West are less preferred routes for Segment 1 – Ogoki Crossing from the perspective of Land and Resource Use and are considered generally similar. The differences between Alternatives 4 East and 4 West are negligible.

Net Effect

- The predicted net effect for each of the alternatives was evaluated as equivalent relative to each other regarding land use compatibility as there are no land use compatibility policies for the affected lands.
- Alternative 1 results in the lowest net effect on access to Ogoki River Provincial Park, while Alternative 4 East has the highest net effect.
- All three alternatives would have similar impact with regard to recreation and tourism as every route alternative could provide increased access to areas that were previously inaccessible and remote.
- Alternative 4 East results in the smallest area of moose habitat, an important species for hunting in the region.
- Alternative 1 and Alternative 4 East are most preferred with regard to extractive industries as they will not remove lands currently used for operations and would provide greater access to lands with potential for future extraction activities.
- The opportunities for new forestry activities are highest with Alternative 1, due to the segment running through land not currently associated with a forestry management plan, and Alternative 4 East and 4 West both run through the Ogoki FMP area.
- Remote tourism operators and trappers would be least affected by Alternative 1 as it is within close proximity of the lowest number of outfitter camps and affects the lowest area of furbearer habitat.

**Climate Adaptation and Resiliency**

**Summary of Climate Adaptation and Resiliency:**

- There is no preferred alternative for Segment 1 – Ogoki Crossing from the perspective of Climate Adaptation and Resiliency.
- There exists significant data gaps and uncertainty in the generation of climate projections that have the appropriate level of granularity to differentiate between alternative routes.
- As such, at this time, there is no discernible difference for the alternatives from a Climate Adaptation and Resiliency perspective.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
<b>Economic</b>						
Regional Economy	<ul style="list-style-type: none"> <li>Traditional Economies.</li> </ul>	<ul style="list-style-type: none"> <li>Change in Ability to Undertake Traditional Economic Activities.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate information on planned and active construction activities to facilitate local planning of traditional economies such as trapping.</li> <li>In selection of final road alignment as part of road design development, where possible, avoid high-quality furbearer habitat.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road has the potential to result in net effects to traditional economies such as trapping.</li> <li>Trapping is the only identified traditional economic activity that may be occurring in the study area. Trapping activity has declined significantly throughout Canada due to low fur prices. Anecdotal input suggests that trapping activity in the LSA has also declined and is no longer an important economic activity.</li> <li>The development of the road may support trapping activity through providing better access to lands used for trapping or result in negative impacts by loss of habitat for targeted species. Despite trappers being requested for information, at this time, we have no input from the trappers on the level of activity in the intersected traplines or their opinions regarding potential impact from this route segment or road development in general.</li> <li>See "Trapping" indicator under Land and Resource Use for ranking of routes in regard to trapline area covered and furbearer habitat impacted.</li> <li>It is also possible that some fishing occurs in local rivers for commercial purposes, but we have no specific information to support this.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road has the potential to result in net effects to traditional economies such as trapping.</li> <li>Trapping is the only identified traditional economic activity that may be occurring in the study area. Trapping activity has declined significantly throughout Canada due to low fur prices. Anecdotal input suggests that trapping activity in the LSA has also declined and is no longer an important economic activity.</li> <li>The development of the road may support trapping activity through providing better access to lands used for trapping or result in negative impacts by loss of habitat for targeted species. Despite trappers being requested for information, at this time, we have no input from the trappers on the level of activity in the intersected traplines or their opinions regarding potential impact from this route segment or road development in general.</li> <li>See "Trapping" indicator under Land and Resource Use for ranking of routes in regard to trapline area covered and furbearer habitat impacted.</li> <li>It is also possible that some fishing occurs in local rivers for commercial purposes, but we have no specific information to support this.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road has the potential to result in net effects to traditional economies such as trapping.</li> <li>Trapping is the only identified traditional economic activity that may be occurring in the study area. Trapping activity has declined significantly throughout Canada due to low fur prices. Anecdotal input suggests that trapping activity in the LSA has also declined and is no longer an important economic activity.</li> <li>The development of the road may support trapping activity through providing better access to lands used for trapping or result in negative impacts by loss of habitat for targeted species. Despite trappers being requested for information, at this time, we have no input from the trappers on the level of activity in the intersected traplines or their opinions regarding potential impact from this route segment or road development in general.</li> <li>See "Trapping" indicator under Land and Resource Use for ranking of routes in regard to trapline area covered and furbearer habitat impacted.</li> <li>It is also possible that some fishing occurs in local rivers for commercial purposes, but we have no specific information to support this.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>	<b>No discernable difference</b>
Summary of Economic:						
<u>Overall</u>						
<ul style="list-style-type: none"> <li><b>All route alternatives are ranked equal for Segment 1 – Ogoki Crossing from the perspective of Economic.</b> The difference between all three alternatives is negligible.</li> <li>All route segments will provide connection to the Marten Falls community and provide the same expected net economic benefit to the community including, for example, an expected decrease in the price of goods.</li> <li>Similarly, all route segments are expected to provide similar employment opportunities and would have similar impact on government expenditure and taxation.</li> <li>There are no specific economic features (e.g., businesses) identified in the PDA of the alternative route segments.</li> <li>The opportunities for economic development including resource extraction activities such as mining are also identified to be similar amongst the alternative routes (see Land and Resource Use) and mineral claim holders indicated that all route options provide them greater access to their site of future potential for extraction and that all routes would benefit their economic potential.</li> <li>Since no information from trappers is available at the time of this evaluation regarding the level of trapping activity along the route segments, the routes are identified to be similar with respect to impact on traditional economies.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>People</b>						
<u>Net Effect</u>						
<ul style="list-style-type: none"> <li>The predicted net effects of the three alternatives were evaluated as equivalent.</li> </ul>						

Factor	Indicator	Measures	Alternative 1	Alternative 4 East	Alternative 4 West
<b>Technical, Engineering and Costs</b>					
Design	• Roadway alignment length.	• Kilometres	• 48.1	• 54.9	• 60.93
	• Number of water crossings.	• Number	• 12	• 16	• 17
	• Length of water crossings.	• Metres	• 380	• 740	• 540
Construction Complexity	• Access to roadway material.	• Description	• Higher haul costs than Alternative 4 as there are fewer bedrock quarry opportunities increasing the hauling costs.	• Savings on haul costs compared to Alternative 1 due to more bedrock quarry opportunities along the Alignment.	• Lowest haul cost option as this segment travels west and goes through bed rock substrates significantly reducing hauling distances.
	• Constructability of roadway.	• High to Low	• Higher complexity – majority of the route traverses poor substrates.	• Medium complexity – there is a balance of the route that traverses both good and bad terrain.	• Lower-Medium complexity – the route path is more heavily weighted towards good terrain.
	• Constructability of water crossing.	• High to Low	• Lower – though narrower crossing of Ogoki (70 m) it crosses it twice (both 70 m).	• Higher – the longest crossing of Ogoki (300 m) option.	• Moderate – single 120 m long crossing of Ogoki.
Miscellaneous	• Schedule implications.	• Description	• Higher – Road construction with poor substrates, terrain and high cost to haul aggregates; no means of access without significant upgrades to the Painter Lake Road section.	• Medium - Given the haul factor for road construction.	• Lower - Proximity to aggregate materials with good terrain.
Operations	• Long-term maintenance.	• Description	• Higher – Given poorer ground terrain compared with other alternatives and gravel hauling costs.	• Medium – Given better access to aggregate resource than Alt 1 and better ground conditions.	• Lower – Given proximity to aggregate materials and best ground conditions.
Cost	• Value of construction.	• \$ CAD	• Roads \$ [REDACTED] • Bridges \$ [REDACTED] • Total \$ [REDACTED]	• Roads \$ [REDACTED] • Bridges \$ [REDACTED] • Total \$ [REDACTED]	• Roads \$ [REDACTED] • Bridges \$ [REDACTED] • Total \$ [REDACTED]

**Summary of Technical, Engineering and Cost:**

Overall

- **Alternative 4 West is the most preferred route alternative for Segment 1 – Ogoki Crossing from the perspective of Technical, Engineering and Cost** for the following reasons:
  - roadway alignment lengths are mutually equal and not a factor when 13 km is added to the southern segment of Alternative 1 to connect with the Anaconda road;
  - has the lowest access to roadway material (haul cost factor is optimized);
  - least amount of schedule restrictions;
  - lowest longer-term operations and maintenance roadway costs; and
  - substantially cheaper than Alternative 4 East in cost and marginally higher than Alternative 1 when factoring in Alternative 1 gap and construction logistics with painter lake road.
- Alternative 1 does NOT include the southern 13 km to link up with the southern node which would account for \$7.2M in structures (one bridge), \$67.2M in roads or \$74.4M in capital costs (incorporated haul costs for this 13 km segment are \$11.6M).
- Long-Term Maintenance inputs are attributed to both the stockpiling and annual hauling (gravelling) of the road, terrain type and potential for repairs.
- Value of Construction includes both a 20% contingency factor and for the structures climate change impact is accounted for and assumed to be 35-40% of the bridge base price.
- Future Economic Development: Early on in the route analysis the project team mentioned the opportunity for the timber industry northwest of the Ogoki would be realized if the Alternative 4 network segments were selected.

## Acronyms

Acronym	Definition
ATV	All-Terrain Vehicle
CEMP	Construction Environmental Management Plan
DFO	Fisheries and Oceans Canada
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
FMP	Forest Management Plan
GHD	General Habitat Description
GHG	Greenhouse Gas
KDE	Kernel Density Estimation
LSA	Local Study Area
MFFN	Marten Falls First Nation
MNR	Ministry of Natural Resources
NHIC	Natural Heritage Information Centre
PDA	Project Development Area
POR	Points of reception
RSA	Regional Study Area
SAR	Species at Risk
SARA	Species at Risk Act
SCC	Species of Conservation Concern
VC	Valued Component

## References

- Environment and Climate Change Canada. 2019. Woodland Caribou, Boreal population (*Rangifer tarandus caribou*): amended recovery strategy [proposed].  
[https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2019.html?utm\\_source=chatgpt.com](https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2019.html?utm_source=chatgpt.com)
- Fisheries and Oceans Canada (DFO). 2023. Measures to Protect Fish and Fish Habitat. July 2023. Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>
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<https://www.ontario.ca/page/general-habitat-description-forest-dwelling-woodland-caribou>
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## Segment 2 – Albany Crossing

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
Indigenous Current Use of Lands and Resources for Traditional Purposes	<ul style="list-style-type: none"> <li>Loss of or change to sites and areas used for traditional activities (hunting, trapping, fishing, berry picking, plant harvesting).</li> </ul>	<ul style="list-style-type: none"> <li>Overlap / intersection of Project footprint with harvesting sites and areas reported by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Continue to engage with Indigenous communities to identify harvesting sites and areas.</li> <li>Avoid, where possible, harvesting sites and areas identified by communities.</li> <li>Utilize signage (Indigenous and English language) during construction to identify harvesting sites and areas in the vicinity of the Project that must be avoided.</li> <li>Where avoidance is not possible, engage with potentially affected communities to discuss appropriate mitigation related to sites and areas used for harvesting.</li> <li>Inform Indigenous communities and trappers who may be trapping in the area of this segment of Project construction activities, schedules, and locations.</li> </ul>	<ul style="list-style-type: none"> <li>20 Marten Falls First Nation (MFFN) harvesting locations intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>13 hunting and / or trapping locations;</li> <li>5 fishing locations; and</li> <li>2 plant harvesting locations.</li> </ul> </li> <li>42 MFFN harvesting locations reported within the Study Area (2.5 km): <ul style="list-style-type: none"> <li>16 hunting and / or trapping locations;</li> <li>11 fishing locations; and</li> <li>15 plant harvesting locations.</li> </ul> </li> <li>61 MFFN harvesting locations reported within the Local Study Area (LSA; 5 km): <ul style="list-style-type: none"> <li>26 hunting and / or trapping locations;</li> <li>14 fishing locations; and</li> <li>21 plant harvesting locations.</li> </ul> </li> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternative 1 is the least preferred route from the perspective of animal, fish, and plant harvesting due to intersection with and / or proximity to harvesting locations.</li> <li>The alternative is located in an area that may be used by Aroland First Nation for traditional purposes, including animal, fish, and plant harvesting; however, specific harvesting locations have not been provided to date.</li> <li>It was noted by Eabametoong First Nation through the Consultation Program that sturgeon is harvested from the Albany River; however, specific harvesting locations have not been provided to date.</li> <li>Highest net effects anticipated given the highest number of interactions with MFFN harvesting locations, and based on MFFN's preferences from animal, fish, and plant harvesting perspectives.</li> </ul>	<ul style="list-style-type: none"> <li>19 MFFN harvesting locations intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>13 hunting and / or trapping locations;</li> <li>4 fishing locations; and</li> <li>2 plant harvesting locations.</li> </ul> </li> <li>31 MFFN harvesting locations reported within the Study Area (2.5 km): <ul style="list-style-type: none"> <li>19 hunting and / or trapping locations;</li> <li>7 fishing locations; and</li> <li>5 plant harvesting locations.</li> </ul> </li> <li>51 MFFN harvesting locations reported within the LSA (5 km): <ul style="list-style-type: none"> <li>23 hunting and / or trapping locations;</li> <li>14 fishing locations; and</li> <li>14 plant harvesting locations.</li> </ul> </li> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternative 4 is the most preferred route from the perspective of animal, fish, and plant harvesting due to intersection with and / or proximity to harvesting locations.</li> <li>The alternative is located in an area that may be used by Aroland First Nation for traditional purposes, including animal, fish, and plant harvesting; however, specific harvesting locations have not been provided to date.</li> <li>It was noted by Eabametoong First Nation through the Consultation Program that sturgeon is harvested from the Albany River; however, specific harvesting locations have not been provided to date.</li> <li>Lowest net effects anticipated given the lower number of interactions with MFFN harvest locations, and based on MFFN's preferences from animal, fish, and plant harvesting perspectives.</li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>
<b>Indicator Summary</b>			Alternative 1 is the least preferred route because it has the greatest intersections with reported MFFN harvesting sites, and it is the least preferred route identified by MFFN from an animal, fish, and plant harvest perspective. As a result, this alternative is anticipated to have higher net effect on sites and areas used for traditional activities.	Alternative 4 is the most preferred route because it has the least intersections with reported MFFN harvesting sites, and it is the most preferred route identified by MFFN from an animal, fish, and plant harvest perspective. As a result, this alternative is anticipated to have the lowest net effect on sites and areas used for traditional activities.	

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
	<ul style="list-style-type: none"> <li>Changes in the availability of lands and resources (e.g., wildlife, fish, vegetation) for traditional harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in land availability resulting from overall road / clearing area of each route assessment.</li> <li>Changes to ungulate habitat availability and distribution.</li> <li>Changes to habitat availability and distribution, and species presence abundance for furbearers that are harvested for traditional purposes.</li> <li>Changes to habitat availability and distribution, and species presence abundance for birds that are harvested for traditional purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Implement appropriate mitigation measures for wildlife, fish, and vegetation resources that are used for traditional purposes – refer to respective valued components (VCs) for mitigation measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>Develop an Environmental Protection Plan with potentially affected Indigenous communities that include best management practices for wildlife, fish, and vegetation protection and mitigation based on Indigenous Knowledge.</li> <li>Develop and implement an Indigenous-led environmental monitoring program that use Indigenous Knowledge to continue to assess changes in availability or quantity of resources so that mitigation measure can be employed more effectively and in “real time” during the construction and operation of the road.</li> <li>Involve local Indigenous communities in the development of access management measures or plans, including the development of policies for non-Indigenous Project personnel while on shift or at temporary construction camps with respect to any harvesting activities.</li> <li>Work with other governing bodies to develop regulations that minimize non-local access to and harvesting pressure on local wildlife, fish, and vegetation.</li> <li>Use Indigenous land users (e.g., hunters and trappers) to monitor the Project area to support the enforcement of access management measures.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is the most preferred as it results in the least amount of land clearing (676.45 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is the least preferred as it results in the greatest amount of land clearing (1,228.57 ha) given the need to access an aggregate deposit along the Alternative 1 alignment.</li> </ul>
				<b>Most Preferred</b>	<b>Least Preferred</b>
				<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any high suitability moose habitat within the Project Development Area (PDA) or any suitable moose habitat features; however, 0.2 ha of highly suitable moose habitat is located within 500 m of the current alignment and may be indirectly disturbed by noise and dust.</li> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat Description (GHD) travel corridors for caribou; however, it is anticipated to disturb 612 ha of known and potential caribou winter use areas and 17 ha of known and potential caribou nursery areas within the PDA, and may indirectly disturb 2,407 ha of known and potential winter use area habitat and 117 ha of known and potential nursery area habitat within 500 m of the current alignment from noise and dust.</li> <li>Highest net effects expected as this route results in the greatest direct and indirect disturbance to caribou habitat. Both route alternatives are predicted to result in equivalent net effects for moose.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any high suitability moose habitat within the PDA and is not anticipated to disturb any suitable moose habitat features; however, 0.6 ha of highly suitable moose habitat is located within 500 m of the current alignment and may be indirectly disturbed by noise and dust.</li> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat travel corridors for caribou; however, it is anticipated to disturb 440 ha of known and potential caribou winter use areas within the PDA and may indirectly disturb 1,845 ha of known and potential winter use area habitat within 500 m of the current alignment from noise and dust.</li> <li>Lowest net effects expected as this route results in the least amount of direct and indirect disturbance to caribou habitat compared to Alternative 1. Both route alternatives are predicted to result in equivalent net effects for moose.</li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>
				<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 634.47 ha of moderate / high-quality American marten habitat.</li> <li>This alternative has a relative abundance of 0.67 wolverine, the presence or abundance of 0 female wolverine and 1 wolverine individuals of unknown sex.</li> <li>The difference in predicted net effects of each alternative on American marten and wolverine is insignificant.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 653.6 ha of moderate / high-quality American Marten habitat.</li> <li>This alternative has a relative abundance of 0.75 wolverine, the presence or abundance of 0 female wolverine and 1 wolverine individuals of unknown sex.</li> <li>The difference in predicted net effects of each alternative on American marten and wolverine is insignificant.</li> </ul>
				<b>No discernible difference</b>	<b>No discernible difference</b>
				<ul style="list-style-type: none"> <li>This alternative is most preferred as it results in the least direct loss of suitable habitat features for waterfowl (92.7 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is least preferred as it results in the greatest direct loss of suitable habitat features for waterfowl (114.6 ha).</li> </ul>
				<b>Most Preferred</b>	<b>Least Preferred</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<ul style="list-style-type: none"> <li>Changes to habitat quantity, quantity, distribution, and connectivity and species survival and reproduction for fish that are harvested for traditional purposes.</li> </ul>		<ul style="list-style-type: none"> <li>This alternative has the least number of waterbody crossing locations (2) where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions without loss of function or individuals are predicted.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has the greatest number of waterbody crossing locations (3) where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions without loss of function or individuals are predicted.</li> </ul>
		<ul style="list-style-type: none"> <li>Changes to the presence and accessibility to traditional use plants.</li> </ul>		<p><b>No discernible difference</b></p> <ul style="list-style-type: none"> <li>This alternative is the least preferred as it results in the greatest direct loss of highly suitable and highly accessible habitats for traditional use plants (482.45 ha).</li> </ul>	<p><b>No discernible difference</b></p> <ul style="list-style-type: none"> <li>This alternative is most preferred as it results in the least direct loss of highly suitable and highly accessible habitats for traditional use plants (391.58 ha).</li> </ul>
		<ul style="list-style-type: none"> <li>Change to access to land utilized for recreation and / or tourism (increased access and pressure on resources).</li> </ul>		<p><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>While both alternatives provide greater access to lands that are currently inaccessible by road and could be used for recreation purposes, from MFFN's perspective the lands and waters adjacent to this alternative are particularly important from a traditional harvesting perspective.</li> <li>As indicated in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project and through the Consultation Program, MFFN community members have expressed concerns about the increased access that this alternative would provide to non-Indigenous and non-local people to these important harvesting areas, resulting in increased pressure on the resources harvested for traditional purposes in these areas.</li> <li>Based on these concerns and interests and the potential for greater net effects, Alternative 1 is the least preferred route option.</li> </ul>	<p><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>While both alternatives provide greater access to lands that are currently inaccessible by road and could be used for recreation purposes, from MFFN's perspective Alternative 4 is the most preferred route as it is the furthest away from important lands and waters, and their resources, used for traditional purposes, and therefore is anticipated to have the lowest net effects on the availability of important resources harvested for traditional purposes in these areas.</li> </ul>
		<ul style="list-style-type: none"> <li>Indigenous Knowledge on important habitat for fish and wildlife that may need to be avoided.</li> </ul>		<p><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>This alternative is the least preferred by MFFN as there are 12 areas identified along this route where fish, including sturgeon, spawn and that should be avoided as they are considered sensitive areas, as noted in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project.</li> </ul>	<p><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>This alternative is the most preferred by MFFN as the net effects on harvested resources are anticipated to be lower for this route. While the route traverses multiple mammal habitats, the potential impacts "seem less dire when compared to potential impacts to fish along the western route (Alternative 1)", as noted in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project.</li> </ul>
				<p><b>Least Preferred</b></p>	<p><b>Most Preferred</b></p>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<b>Indicator Summary</b>		Alternative 1 is the least preferred route because it is anticipated to have the greatest net effects on caribou and traditional use plants, and based on the preference of the MFFN community as this alternative is located adjacent to areas that MFFN has identified as important traditional harvesting areas and sensitive fish habitat and community members are concerned about increased access to these areas and associated potential impacts on resource availability in these areas.	Alternative 4 is the most preferred route because it is anticipated to have the lowest net effects on caribou and traditional use plants, and based on the preference of the MFFN community as this alternative avoids areas that MFFN has identified as important traditional harvesting areas and sensitive fish habitat, thereby addressing community concerns related to increased access to these areas and associated potential impacts on resource availability in these areas.
	<ul style="list-style-type: none"> <li>Changes in quality of resources for traditional purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for change in the quality of country food.</li> </ul>	<ul style="list-style-type: none"> <li>Community input into alignment routing, component siting and road design avoid important areas of botanical and wildlife resources that serve as country foods, to the extent feasible.</li> <li>Mitigation measures during construction to prevent spills and malfunctions, and to reduce any impacts associated with these should they happen.</li> <li>Develop a response plan in case of spills or other environmental emergencies along the road.</li> <li>Develop and implement an Indigenous-led environmental monitoring program that utilizes Indigenous Knowledge to continue to assess potential changes in the quality of resources.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>
	<ul style="list-style-type: none"> <li>Potential for changes in the perception of quality of country foods.</li> </ul>	<b>Indicator Summary</b>		<b>No discernible difference</b>	<b>No discernible difference</b>
	<ul style="list-style-type: none"> <li>Changes in access to sites and areas used for traditional activities.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for any temporary or permanent Project components to impede access to sites and areas used for harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> <li>Involve local Indigenous communities in the development of access management measures or plans.</li> <li>Create temporary detours for snowmobiles and ATVs during construction. Use signage in English and Indigenous languages for any temporary detour routes.</li> <li>Provide community updates regarding location and timing of construction activities.</li> <li>Provide access ramps to traditional travel routes bisected by the road, where required.</li> <li>Continued engagement with Indigenous communities to identify any access concerns during construction and operation.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the perception of the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the perception of the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul>
	<ul style="list-style-type: none"> <li>Change in waterway navigability.</li> </ul>	<b>Indicator Summary</b>		<b>No discernible difference</b>	<b>No discernible difference</b>
				There is no preference between the alternatives as there is currently no information available for this indicator. This will be assessed as part of the overall Project impact assessment, and will be informed by inputs from Indigenous communities, where provided.	
				<ul style="list-style-type: none"> <li>Current alignment intersects with 8 reported MFFN travel routes and area, including overland travel routes, supply trails, walking trail areas, a water travel route, and several historical trails.</li> <li>No additional travel routes and areas within the Study Area (2.5 km) or the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>Current alignment intersects with 7 reported MFFN travel routes and areas, including overland travel routes, supply trails, walking trail areas, a water travel route, and several historical trails.</li> <li>No additional travel routes and areas within the Study Area (2.5 km) or the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>
				<b>No discernible difference</b>	<b>No discernible difference</b>
				<ul style="list-style-type: none"> <li>All route options cross a similar number of waterbodies (7-8).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>All route options cross a similar number of waterbodies (7-8).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>
				<b>No discernible difference</b>	<b>No discernible difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4	
<b>Aboriginal and Treaty Rights and Interests</b>						
		<b>Indicator Summary</b>		There is no preference between the alternatives as there is no discernable difference among them for this indicator as minimal net effects are anticipated with mitigation measures.		
Cultural Continuity and Well-being (ability to practice and transmit cultural traditions)	Loss of or change to culturally important sites and areas and their access.	<ul style="list-style-type: none"> <li>Comparison / intersection of Project footprint with cultural, spiritual, and / or historical sites and areas reported by Indigenous communities (habitation, burial, ceremonial, sacred, meeting, teaching, place name).</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Continue to engage with Indigenous communities to identify culturally important sites and areas and associated access.</li> <li>Complete any necessary or appropriate archaeological and cultural heritage assessments.</li> <li>Avoid, where possible, culturally important sites and areas identified by communities.</li> <li>Use signage (Indigenous and English language) during construction to identify sites and areas in the vicinity of the Project that must be avoided.</li> <li>Where avoidance is not possible, engage with potentially affected communities to discuss appropriate mitigation related to culturally important sites and areas (e.g., Cultural Heritage Impact Assessment, community-specific chance finds protocols, etc.).</li> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> <li>Involve local Indigenous communities in the development of access management measures or plans.</li> <li>Create temporary detours for snowmobiles and ATVs during construction. Use signage in English and Indigenous languages for any temporary detour routes.</li> <li>Provide community updates regarding location and timing of construction activities.</li> <li>Provide access ramps to travel routes bisected by the road, where required.</li> <li>Continued engagement with Indigenous communities to identify any access concerns during construction and operation.</li> </ul>	<ul style="list-style-type: none"> <li>4 reported MFFN cultural, spiritual, and / or historical sites or areas are intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>the route intersects with a place name site;</li> <li>the route transects a traditional gathering area with burial grounds;</li> <li>the route transects a traditional meeting place and medicinal plant harvesting area; and</li> <li>the route transects a traditional meeting place area.</li> </ul> </li> <li>25 MFFN cultural, spiritual, and / or historical locations reported within the Study Area (2.5 km).</li> <li>41 MFFN cultural, spiritual, and / or historical locations reported within the LSA (5 km).</li> <li>A highly culturally sensitive area for MFFN was reported in proximity (within 500 m) to the current alignment and based on input from the MFFN community during the Consultation Program, this area is highly used and to be completely avoided. Therefore, Alternative 1 is the least preferred route given the potential for greater net effects to MFFN cultural, spiritual, and / or historical sites or areas.</li> </ul>	<ul style="list-style-type: none"> <li>3 reported MFFN cultural, spiritual, and / or historical sites or areas are intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>the route intersects with a place name site;</li> <li>the route skirt the western boundary of a reported traditional meeting area; and</li> <li>the route traverses the easternmost portion of a traditional gathering area that contain burial grounds.</li> </ul> </li> <li>16 MFFN cultural, spiritual, and / or historical locations reported within the Study Area (2.5 km).</li> <li>31 MFFN cultural, spiritual, and / or historical locations reported within the LSA (5 km).</li> <li>Based on input from the MFFN community during the Consultation Program, Alternative 4 is the most preferred route as it avoids important and highly culturally sensitive areas in comparison to Alternative 1 and is anticipated to result in lower net effects as a result.</li> </ul>	
				Changes in previously identified archaeological sites.	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> <li>Archaeological potential within much of both alternatives remains to be mitigated, and as such they are equally ranked.</li> </ul>	Registered archaeological site nearby; however, archaeological potential within much of both alternatives remains to be mitigated, and as such both alternatives are equally ranked.
				Potential for any temporary or permanent Project components to impede access to culturally important sites and areas.	<b>No discernible difference</b>	<b>No discernible difference</b>
					<ul style="list-style-type: none"> <li>Current alignment intersects with 8 reported MFFN travel routes and area, including overland travel routes, supply trails, walking trail areas, a water travel route, and several historic trails.</li> <li>No additional travel routes and areas within the Study Area (2.5 km) or the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal effects anticipated with the application of mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>Current alignment intersects with 7 reported MFFN travel routes and areas, including overland travel routes, supply trails, walking trail areas, a water travel route, and several historic trails.</li> <li>No additional travel routes and areas within the Study Area (2.5 km) or the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>
					<b>No discernible difference</b>	<b>No discernible difference</b>
					<b>No discernible difference</b>	<b>No discernible difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<ul style="list-style-type: none"> <li>Change in waterway navigability.</li> </ul>		<ul style="list-style-type: none"> <li>All route options cross a similar number of waterbodies (7-8).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>	<ul style="list-style-type: none"> <li>All route options cross a similar number of waterbodies (7-8).</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> </ul>
		<b>Indicator Summary</b>		<b>No discernible difference</b>	<b>No discernible difference</b>
				Alternative 1 is the least preferred route because it has the most intersections with reported MFFN cultural, spiritual, and / or historical sites or areas, it is located in proximity to a highly culturally sensitive area used by MFFN and based on MFFN preference. Therefore, it is anticipated to result in greater net effects on culturally important sites and areas.	Alternative 4 is the most preferred route because it has the fewest intersections with reported MFFN cultural, spiritual, and / or historical sites or areas, it avoids important and highly culturally sensitive areas in comparison to Alternative 1 and based on MFFN community preference. Therefore, it is anticipated to result in lower net effects on culturally important sites and areas.
	<ul style="list-style-type: none"> <li>Changes in the sufficiency of lands and resources for cultural practices.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for exceedances in any thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures identified to avoid or minimize changes in quantity and quality of lands and resources for traditional purposes will also serve as mitigation measures for this indicator.</li> <li>Where thresholds are identified, engage with Indigenous communities to discuss appropriate mitigation measures to be included in the Environmental Protection Plan.</li> </ul>	<ul style="list-style-type: none"> <li>There is currently no information on thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> <li>This will be assessed as part of the overall Project impact assessment, where information is provided by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>There is currently no information on thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> <li>This will be assessed as part of the overall Project impact assessment, where information is provided by Indigenous communities.</li> </ul>
		<b>Indicator Summary</b>		<b>No discernible difference</b>	<b>No discernible difference</b>
				There is no preference between the alternatives as there is currently no information available for this indicator. This will be assessed as part of the overall Project impact assessment, should this information be provided by Indigenous communities.	
	<ul style="list-style-type: none"> <li>Changes in the experience of being on the land.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in noise.</li> </ul>	<ul style="list-style-type: none"> <li>Work with Indigenous communities to identify appropriate buffers for harvesting and cultural use sites and areas during alignment routing, component siting, and road design.</li> <li>Implement appropriate mitigation measures for noise, visual, and air quality – refer to respective VCs for mitigation measures.</li> <li>Engage with Indigenous communities on construction schedule to identify key harvesting and cultural use times and sites and areas that should be avoided.</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the tranquility that is experienced when out on the land is important for maintaining connections to the land.</li> <li>20 reported MFFN harvesting locations, 4 reported MFFN cultural, spiritual, and / or historical locations, and 8 reported MFFN travel routes intersected by the current alignment and associated aggregate areas.</li> <li>There are 13 MFFN land use locations that have been reported within 500 m of the current alignment, including: <ul style="list-style-type: none"> <li>a trapping site;</li> <li>a hunting site;</li> <li>2 fish harvest sites;</li> <li>a plant harvest site;</li> <li>a travel route actively used to access hunting and fishing sites;</li> <li>2 camp sites;</li> <li>a burial site;</li> <li>a storied / legend area;</li> <li>a highly culturally sensitive area; and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the tranquility that is experienced when out on the land is important for maintaining connections to the land.</li> <li>19 MFFN harvesting locations, 3 reported MFFN cultural, spiritual, and / or historical locations, and 7 reported MFFN travel routes intersected by the current alignment and associated aggregate areas.</li> <li>There are 6 MFFN land use locations that have been reported within 500 m of the current alignment, including: <ul style="list-style-type: none"> <li>2 trapping sites;</li> <li>3 hunting sites; and</li> <li>a plant harvest site.</li> </ul> </li> <li>The alternative is also adjacent to a reported MFFN area that contains a traditional meeting place, a historical site, and historic trails; however, it is not known if this area continues to be used by the MFFN community.</li> <li>This alternative is anticipated to result in lower net effects as there are fewer sites and areas in</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
				<ul style="list-style-type: none"> <li>○ 2 place name sites.</li> <li>• The alternative also traverses a traditional gathering area with many burial sites / grounds reported, and a traditional meeting area that are known to be used by the MFFN community.</li> <li>• As indicated in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, this alternative is the least preferred given its proximity to an important travel route (within 500 m).</li> <li>• This alternative is anticipated to result in greater net effects given its proximity to many sites and areas used by the MFFN community.</li> </ul>	proximity to the route when compared to Alternative 1.
		<ul style="list-style-type: none"> <li>• Changes in the visual environment.</li> </ul>		<p style="text-align: center;"><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>• Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the natural landscape is important for maintaining connections to the land.</li> <li>• The development of watercourse crossings (bridges) can impact the natural landscape (visual environment), and therefore the experience of being on the land.</li> <li>• Changes to vegetation and ecosystems can change the landscape character, and therefore the experience of being on the land.</li> <li>• Both alternatives are anticipated to require a similar number of watercourse crossings and are anticipated to have similar net effects on landscape character. However, Alternative 1 is located in proximity and adjacent to the Albany River and has the potential to result in a greater visual impact and therefore net effects.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p>	<p style="text-align: center;"><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>• Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the natural landscape is important for maintaining connections to the land.</li> <li>• The development of watercourse crossings (bridges) can impact the natural landscape (visual environment), and therefore the experience of being on the land.</li> <li>• Changes to vegetation and ecosystems can change the landscape character, and therefore the experience of being on the land.</li> <li>• Both alternatives are anticipated to require a similar number of watercourse crossings and are anticipated to have similar net effects on landscape character. However, Alternative 4 is anticipated to result in lower net effects in terms of visual impact given its distance from the Albany River relative to Alternative 1.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p>
		<b>Indicator Summary</b>		Alternative 1 is the least preferred route because it is anticipated to have greater net effects from both a noise and visual perspective given its proximity to the Albany River and sites and areas used by MFFN. As a result, this alternative is anticipated to have the greatest net effect on the experience of being on the land.	Alternative 4 is the most preferred route because it is anticipated to have lower net effects from both a noise and visual perspective given its location further away from the Albany River and from sites and areas used by MFFN. As a result, this alternative is anticipated to have the lowest net effect on the experience of being on the land.
	<ul style="list-style-type: none"> <li>• Changes to ability to practice and transmit cultural traditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for changes in the ability to use preferred harvesting areas, camps, cabins, and ancestral locations (historical family or village sites, and traditional gathering areas and meeting places).</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid, where possible, preferred harvesting and cultural use sites and areas identified by communities.</li> <li>• Work with Indigenous communities to identify mitigation measures for potential impacts on the ability to practice and transmit cultural traditions (e.g., schedule construction with consideration for preferred harvesting times where possible, support with developing on the land programming for members, including youth).</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is located directly adjacent to, and may intersect with, important animal, fish, and plant harvesting sites and areas that may hold cultural and historical significance to some members and their families. Based on the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, some community members would prefer that the road is as far away as possible from these sites and areas, and therefore Alternative 1 is the least preferred of the routes.</li> </ul>	<ul style="list-style-type: none"> <li>• A preferred MFFN fishing location is reported approximately 1 km from the current alignment.</li> <li>• Based on the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, this alternative is the most preferred as it is further away from preferred animal, fish, and plant harvesting sites when compared to Alternative 1.</li> <li>• While this alternative does not directly intersect with any reported MFFN habitation sites, there are 7 MFFN camps sites, cabins, or historical family</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<ul style="list-style-type: none"> <li>Potential for changes in ability to practice cultural traditions in the preferred way (preferred methods in the preferred time of year).</li> <li>Potential for changes in ability to access and use important teaching sites and areas, including place names and sites and areas of importance based on oral history / stories / legends.</li> </ul>	<ul style="list-style-type: none"> <li>Develop all temporary and permanent road signs to include local Indigenous language(s) on them.</li> <li>Work with local Indigenous communities to develop interpretative signage along the route. This could include information about the local Indigenous communities and their histories in the region and on the land, their culture, and / or the cultural landscape.</li> </ul>	<ul style="list-style-type: none"> <li>While this alternative does not directly intersect with any reported MFFN habitation sites, there are 8 MFFN camps sites, cabins, or historical family or village site reported within the Study Area (2.5 km). According to the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternative 1 is the least preferred route from the perspective of habitation sites.</li> <li>This alternative traverses a traditional gathering area and a traditional meeting place area.</li> <li>This alternative is the least preferred based on MFFN preferences and because it is anticipated to result in greater net effects compared to Alternative 4 given its proximity to important harvesting sites and areas, habitation sites, and traditional gathering and meeting areas.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>Information on how the ability to practice cultural traditions in the preferred way could be affected by the road and associated alternatives is not available at this time and will be assessed as part of the overall Project impact assessment.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, place name sites contribute to the strengthening of the Ojibwe language and represent the passing down of knowledge, connection to the land, culture, and history.</li> <li>Similarly, teaching, legend, and / or storied sites support the passing of knowledge, connection to the land, culture, and history.</li> <li>This alternative intersects with one MFFN place name site – Kagama or Kagiami Falls.</li> <li>8 MFFN place name sites are reported within the Study Area (within 2.5 km) and LSA (within 5 km).</li> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternative 1 is the least preferred route from the perspective of traditional place name sites given the importance of the sites located in proximity to this route.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p>	<p>or village site reported within the Study Area (2.5 km). According to the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternative 4 is the most preferred route from the perspective of habitation sites.</p> <ul style="list-style-type: none"> <li>This alternative skirts the eastern portion of a traditional gathering area and the western boundary of a traditional meeting place area.</li> <li>This alternative is the most preferred based on MFFN preferences and because it is anticipated to result in lower net effects compared to Alternative 1 given its distance from important harvesting sites and areas, habitation sites, and traditional gathering and meeting areas.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>Information on how the ability to practice cultural traditions in the preferred way could be affected by the road and associated alternatives is not available at this time and will be assessed as part of the overall Project impact assessment.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, place name sites contribute to the strengthening of the Ojibwe language and represent the passing down of knowledge, connection to the land, culture, and history.</li> <li>Similarly, teaching, legend, and / or storied sites support the passing of knowledge, connection to the land, culture, and history.</li> <li>This alternative intersects with one MFFN place name site – kiinaybik pahwiitik (snake rapids).</li> <li>2 MFFN place name sites are reported within the Study Area (within 2.5 km) and LSA (within 5 km).</li> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, Alternative 4 is the most preferred route from the perspective of traditional place name sites as this route option is further away from these important sites.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
			<b>Indicator Summary</b>	Alternative 1 is the least preferred route because of its proximity to important MFFN traditional harvesting sites and areas, habitation sites, traditional gathering and meeting areas, and traditional place name sites of cultural and historical significance to the community and based on MFFN community preference. Therefore, it is anticipated to have the greatest net effect on the ability to practice and transmit cultural traditions.	Alternative 4 is the most preferred route because it is further from important MFFN traditional harvesting sites and areas, habitation sites, traditional gathering and meeting areas, and traditional place name sites of cultural and historical significance to the community compared to Alternative 1 and based on MFFN community preference. Therefore, it is anticipated to have the lowest net effect on the ability to practice and transmit cultural traditions.
<b>Summary of Aboriginal and Treaty Rights and Interests:</b>					
<i>Overall</i>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Aboriginal and Treaty Rights and Interests, as it has the lowest potential for impacts on sites and areas used for traditional activities, the availability of lands and resources for traditional harvesting, culturally important sites and areas, experiences of being on the land, and the ability to practice and transmit cultural traditions. This alternative is also the preferred route options of MFFN based on information provided through the Project’s Consultation and Indigenous Knowledge programs.</li> <li>Alternatives 1 is the least preferred routes for Segment 2 – Albany Crossing from the perspective of Aboriginal and Treaty Rights and Interests.</li> </ul>					
<i>Impacts / Net Effects</i>					
<ul style="list-style-type: none"> <li>Anticipated and potential impacts / net effects were considered higher for Alternative 1 and lower for Alternative 4.</li> <li>Alternative 4 has the least intersection with reported MFFN harvesting sites, and it is the most preferred route identified by MFFN from an animal, fish, and plant harvest perspective, therefore it is anticipated to have the lowest net effects on sites and areas used for traditional activities.</li> <li>Alternative 4 is anticipated to have the lowest net effects on caribou and traditional use plants, and it is the preference of MFFN as it avoids areas that community members have identified as important traditional harvesting areas and sensitive fish habitat, thereby addressing community concerns related to increased access to these sensitive harvesting and habitat areas and associated potential impacts on resource availability in these areas. Indirect effects of increased access to non-Indigenous land users and harvesters may not be fully mitigated, regardless of the alternative selected.</li> <li>There is no information currently available to determine the net effects of the alternatives on the quality, or perceived quality, of resources used for traditional purposes – this will be assessed in the future as part of the project impact assessment.</li> <li>Both alternatives would have similar impact with regard to changes in access to sites and areas used for traditional activities and culturally important sites and areas, with minimal impacts expected with appropriate mitigation and given the nature of the project (a road).</li> <li>Alternative 4 is anticipated to result in lower net effects on culturally important sites and areas as it has the fewest intersections with reported MFFN cultural, spiritual, and / or historical sites or areas, and it avoids important and highly culturally sensitive areas in comparison to Alternative 1. It is also the preferred route of the MFFN community given the potential impacts of Alternative 1 on culturally important sites and areas.</li> <li>There is no information currently available to determine the potential impact on the sufficiency of lands and resources for cultural practices – this will be assessed in the future as part of the project impact assessment, where information is provided by Indigenous communities.</li> <li>Alternative 4 is anticipated to have lower net effects on the experience of being on the land given its location further away from the Albany River and from sites and areas used by MFFN compared to Alternative 1.</li> <li>Alternative 4 is anticipated to have the lowest net effects on the ability to practice and transmit cultural traditions as it is further from important MFFN traditional harvesting sites and areas, habitation sites, traditional gathering and meeting areas, and traditional place name sites of cultural and historical significance to the community compared to Alternative 1. It is also the preferred route of the MFFN community from the perspective of potential impacts on traditional place name sites.</li> <li>The comprehensive assessment of net effects to Aboriginal and Treaty Rights and Interests will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC, depending on additional information provided by Indigenous communities in terms of Land and Resource Use for traditional purposes and cultural traditions.</li> </ul>					
<i>Limitations</i>					
<ul style="list-style-type: none"> <li>Information on Indigenous Land and Resource Use for traditional purposes in the area of Segment 2 – Albany Crossing is largely limited to the MFFN community. There is currently very limited available information on Land and Resource Use for traditional purposes by other Indigenous communities, including Eabametoong First Nation and Aroland First Nation, in the area of Segment 2.</li> <li>The route preferences indicated in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project are based on new information collected as part of the study only; the stated preferences did not factor in MFFN Indigenous Knowledge, land use and occupancy information previously collected as part of the community-based land use planning process and shared with the Project Consultant Team in 2019.</li> <li>Information on whether locations and areas are presently used by MFFN for traditional purposes (or were only used in the past) is not available for most of the provided by MFFN.</li> <li>It is unknown if, but unlikely that, all traditional Land and Resource Use sites and areas reported have been ground-truthed to confirm location accuracy.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Water</b>					
<b>Fish, Fish Habitat</b>					
Fish and Fish Habitat (VCs): <ul style="list-style-type: none"> <li>• Lake Sturgeon</li> <li>• Walleye</li> <li>• Brook Trout</li> <li>• Northern Pike</li> <li>• Lake Whitefish</li> <li>• Burbot</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat Quantity and Quality.</li> <li>• Distribution and connectivity to habitat and migration.</li> <li>• Survival and reproduction.</li> </ul>	<ul style="list-style-type: none"> <li>• Total number of waterbody crossings</li> <li>• Number of crossings requiring in-water work (e.g., culverts, bridge piers or abutments below the high-water mark)</li> <li>• Number of crossings requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul>	<ul style="list-style-type: none"> <li>• Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include:               <ul style="list-style-type: none"> <li>○ Development and implementation of a Construction Environmental Management Plan (CEMP) by the Contractor.</li> <li>○ Adherence to in-water work timing windows.</li> <li>○ Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>○ Adherence to Fisheries and Oceans Canada's (DFO) <i>Measures to Protect Fish and Fish Habitat</i> (DFO, 2023).</li> <li>○ Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>○ Measures to avoid unnecessary idling to minimize emissions and greenhouse gasses (GHGs).</li> <li>○ Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>○ Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>○ Measures to limit the spread and / or introduction of invasive species.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is anticipated to:               <ul style="list-style-type: none"> <li>○ cross 7 waterbodies;</li> <li>○ cross 5 waterbodies requiring in-water work; and</li> <li>○ cross 2 waterbodies requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is anticipated to:               <ul style="list-style-type: none"> <li>○ cross 8 waterbodies;</li> <li>○ cross 6 waterbodies requiring in-water work; and</li> <li>○ cross 3 waterbodies requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul> </li> </ul>
<b>Summary of Fish, Fish Habitat:</b>					
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li>• <b>Alternative 1 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Fish and Fish Habitat.</b></li> <li>• The route has the least number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>• Alternative 4 is the least preferred (moderately) alternative of Segment 2 – Albany Crossing from the perspective of fish and fish habitat, because it has the greatest number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>• There is a negligible difference between the alternatives.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>• The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions, without loss of function or individuals are predicted. The comprehensive review of fish and fish habitat and assessment of net effects will be completed on the preferred route selected and may result in different determination of predicted net effects.</li> </ul> <p><b>Notes:</b></p> <p>The requirement for in-water works are determined as follows:</p> <ul style="list-style-type: none"> <li>• For waterbody crossings with bankfull widths less than 5 m, it is assumed that culverts would be used (requiring in-water work).</li> <li>• For waterbody crossings with bankfull widths greater than or equal to 5 m and less than 25 m, it is assumed that clear span bridges would be used (no in-water work).</li> <li>• For waterbody crossings greater than or equal to 25 m, it is assumed that bridges with piers and abutments would be used (requiring in-water work).</li> <li>• For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it is assumed that in-water work would be required.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Water</b>					
<b>Groundwater and Geochemistry</b>					
Groundwater	<ul style="list-style-type: none"> <li>Groundwater Quality: Degradation of physical and chemical characteristics of groundwater.</li> <li>Groundwater Quantity: Change in groundwater levels.</li> </ul>	<ul style="list-style-type: none"> <li>Areas of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination. (hectares).</li> </ul>	<ul style="list-style-type: none"> <li>Design stormwater management features to contain runoff and allow it to infiltrate locally.</li> <li>Restore land cover on unused parts of road construction footprint (construction camps, aggregate pits).</li> <li>Implement spill prevention, monitoring, control and response programs for road construction and operation.</li> <li>Minimize or avoid using salt solutions for dust / ice control.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative will intersect 485 ha of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative will intersect 543 ha of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination.</li> </ul>
<p><b>Summary of Groundwater and Geochemistry:</b></p> <p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 1 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Groundwater and Geochemistry</b> as it crosses over the least area of coarse-grained and bedrock surficial materials.</li> <li>Alternative 1 crosses over the least amount of area of coarse-grained and bedrock surficial materials.</li> <li>Alternative 4 crosses over the greatest amount of area of coarse-grained and bedrock surficial materials.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>Alternative 4 results in higher net effects than Alternative 1 due to its intersection with coarse-grained surficial deposits and bedrock. This comparative analysis evaluated two route alternatives based on the interaction of their PDAs and the representative indicator measures and did not consider the effects to groundwater at the local or regional scale (i.e., LSA or regional study area). The comprehensive assessment of net effects to the groundwater VC, will be completed on the preferred route selected, and may result in a different determination of predicted net effects.</li> </ul>					
<b>Peatlands</b>					
Peatland Ecosystems	<ul style="list-style-type: none"> <li>Availability (decrease / increase of overall amount of peatland area)</li> <li>Distribution (changes to the arrangement and connectivity of Peatlands)</li> <li>Function and Composition (change in plant species composition or ecological function).</li> </ul>	<ul style="list-style-type: none"> <li>Peatland area (hectares) disturbed per alternative.</li> <li>Number of peatlands type fragmented.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Avoid using peatlands for staging, where possible.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for peatlands protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 344.85 ha of peatland and 10 peatland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 302.38 ha of peatland and 6 peatland ecosite types.</li> </ul>
<p><b>Summary of Peatlands:</b></p> <p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Peatlands</b> as it results in the lower net effects relative to Alternative 1 through smaller direct loss of peatland area.</li> </ul> <p><u>Peatland Area</u></p> <ul style="list-style-type: none"> <li>Alternative 4 is the most preferred as it results in the least direct loss of peatland area.</li> <li>Alternative 1 is the least preferred as it results in the greatest loss of peatland area.</li> <li>Number of Peatland Types Fragmented</li> <li>Alternative 4 is the most preferred as it impacts the least number of peatland types.</li> <li>Alternative 1 is the least preferred as it impacts the greatest number of peatland types.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>Alternative 1 results in higher net effects than Alternative 4 due to direct loss of peatland area and the higher number of peatland types impacted. This comparative analysis evaluated the route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to peatland VCs at the local or regional scale (i.e., LSA or regional study area). The predicted net effects have not considered all potential mitigation or design elements to maintain peatland function (e.g., hydrology) that may be applied at a later stage of project design. The comprehensive assessment of net effects to the peatland VCs will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Water</b>					
<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>Note that for the purposes of the alternatives assessment, only the availability (area) of peatlands disturbed and the number of peatland types fragmented were used because these measures can be quantified and are unbiased. Loss of peatlands also reduces their overall function and ability to store carbon, so those indicators are indirectly being assessed by determining the area of peatlands lost and fragmented.</li> <li>This analysis is based on mapping that does not incorporate data collected during the 2023 field programs. This 2023 field information may refine the peatlands mapping that will be included in final reporting.</li> </ul>					
<b>Surface Water</b>					
Surface Water	<ul style="list-style-type: none"> <li>Surface Water Quantity.</li> <li>Surface Water Quality.</li> </ul>	<ul style="list-style-type: none"> <li>Total number of waterbody crossings.</li> <li>Flow regime (permanent vs. intermittent or ephemeral).</li> <li>Channel length and / or width or wetted area within the proposed corridor (to be tallied as a total for all the crossing locations within a given segment).</li> <li>Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to flow conveyance and erosion and sedimentation processes.</li> <li>Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features (e.g., sensitive fish communities, areas of known channel instability).</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Measures to avoid unnecessary vehicle and machine idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas a minimum of 30 m from waterbodies.</li> <li>Wash water from vehicles and equipment will not be allowed to enter a waterbody and will be conveyed to areas for infiltration, treated prior to discharge to the receiving environment, or hauled off-site.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>cross 7 waterbodies, all of which are inferred as permanent;</li> <li>intersect 29,112 m<sup>2</sup> of wetted area within the proposed corridor;</li> <li>cross 5 waterbodies (27,332 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>cross 3 waterbodies (26,800 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>cross 8 waterbodies, all of which are inferred as permanent;</li> <li>intersect 14,125 m<sup>2</sup> of wetted area within the proposed corridor;</li> <li>cross 6 waterbodies (12,580 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>cross 3 waterbodies (12,050 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>
<p><b>Summary of Surface Water:</b></p> <p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Surface Water.</b> Although Alternative 4 includes one more crossing than Alternative 1, it carries a total wetted area that is roughly half of the associated conditions at Alternative 1 and includes the same number of crossings with heightened relevance or sensitivity to effects.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>The predicted net effects for both alternatives are predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures (including properly sized and designed water crossing structures, installation and maintenance of appropriate erosion and sediment controls, and implementation of construction best management practices), the potential effects on surface water receivers are expected to be limited. As such, there is a negligible net effect differences between the alternatives from the perspective of surface water.</li> </ul> <p><b>Notes:</b></p> <p>The requirement for in-water determined as follows:</p> <ul style="list-style-type: none"> <li>For waterbody crossings with bankfull widths less than 5 m, it is assumed that culverts would be used (requiring in-water work).</li> <li>For waterbody crossings with bankfull widths greater than or equal to 5 m and less than 25 m, it is assumed that clear span bridges would be used (no in-water work).</li> <li>For waterbody crossings greater than or equal to 25 m, it is assumed that bridges with piers and abutments would be used (requiring in-water work).</li> <li>For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it is assumed that in-water work would be required.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<b>Physiography, Terrain and Soils</b>					
Physiography, Terrain and Soils	Quantity and distribution of terrain units.	<ul style="list-style-type: none"> <li>Area of surficial materials disturbed per alternative.</li> <li>Area of potential land with permafrost processes.</li> <li>Area of class IV and V terrain stability per alternative.</li> <li>Number of significant landforms disturbed per alternative.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize areas of vegetation clearing and soil disturbance.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 676 ha of surficial materials;</li> <li>intersect 0 ha of potential land with permafrost;</li> <li>intersect 0.2 ha of Class IV (&lt;0.1% of alternative footprint) and 0.0 ha of Class V terrain; and</li> <li>disturb 2 significant landforms.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 711.5 ha of surficial materials;</li> <li>intersect 0 ha of potential land with permafrost;</li> <li>intersect 0.5 ha of Class IV (&lt;0.1 % of alternative footprint) and 0.0 ha of Class V terrain; and</li> <li>disturb 3 significant landforms.</li> </ul> </li> </ul>
	Quantity and distribution of soil map units.	<ul style="list-style-type: none"> <li>Area of soil disturbed (excludes non-soils such as bedrock and water) per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, temporary construction camps, laydown areas).</li> <li>Minimize areas of vegetation clearing and soil disturbance.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for soil erosion, salvage and handling.</li> </ul>	<ul style="list-style-type: none"> <li>672 ha (99% of alternative footprint).</li> </ul>	<ul style="list-style-type: none"> <li>704.7 ha (99% of alternative footprint).</li> </ul>
	Soil Quality / Productivity.	<ul style="list-style-type: none"> <li>Area of high-water erosion risk disturbed per alternative.</li> <li>Area of high wind erosion risk disturbed per alternative.</li> <li>Amount of soil that is considered suitable for reclamation.<sup>2</sup></li> <li>Area of high compaction risk disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>Use clearing equipment that minimizes surface disturbance, soil compaction and topsoil loss (e.g., equipment with low ground pressure tracks or tires, blade shoes, and brushes), where feasible.</li> <li>Where soils are prone to wind erosion, tackify, cover, seed, and / or apply water during periods of high erosion potential (e.g., summer and fall).</li> <li>Minimize soil disturbance by building on bedrock, where feasible.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for soil erosion, salvage and handling.</li> <li>Construct in winter to avoid compaction, where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 0 ha of area with high-water erosion risk;</li> <li>disturb 0 ha of area with high wind erosion risk;</li> <li>disturb 471 ha (70% of alternative footprint) of soil that is considered suitable for reclamation; and</li> <li>intersect 48 ha (7% of alternative footprint) of area with high compaction risk.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 0 ha of area with high-water erosion risk;</li> <li>disturb 296.4 ha of area with high wind erosion risk (41.7% of alternative footprint);</li> <li>disturb 178.6 ha (25% of alternative footprint) of soil that is considered suitable for reclamation; and</li> <li>intersect 32.1 ha (4.5% of alternative footprint) of area with high compaction risk.</li> </ul> </li> </ul>

**Summary of Physiography, Terrain and Soils:**

- Overall
- Alternative 1 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Physiography, Terrain and Soils** as this alternative is anticipated to disturb fewer significant landforms and a smaller area of surficial materials, soil, areas of high-water and wind erosion risk than Alternative 4.
  - Alternative 4 would remove the largest area of surficial materials.
  - Alternative 4 would impact the largest area of potentially unstable ground with 0.5 ha (<0.1%) of the Alternative 4 area.
  - No permafrost processes were identified to intersect with either of the two alternatives.
  - Alternative 1 would affect one fewer significant landforms than Alternative 4.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<ul style="list-style-type: none"> <li>Alternative 1 and Alternative 4 have the same percentage of soil that would potentially be affected (99%), however Alternative 4 is larger in area, and therefore would disturb more soil.</li> <li>Neither alternative has areas identified as being at a potentially high risk for water erosion.</li> <li>Alternative 1 has no area identified as being potentially at high risk for wind erosion, however nearly a quarter (42%) of Alternative 4 has soils at a high risk of wind erosion identified.</li> <li>A large percentage (70%) of the soil in the Alternative 1 area is rated as being suitable for reclamation (i.e., soil used to reclaim temporarily disturbed areas following construction), and only 25% of Alternative 4 is suitable for reclamation.</li> <li>Alternative 1 and Alternative 4 have similar percentages of soil that are potentially at risk of compaction (7% and 4.5%, respectively), however Alternative 1 is larger in size, and therefore will affect more potentially compactable soils.</li> </ul>					
<b>Net Effects</b>					
<ul style="list-style-type: none"> <li>Alternative 4 results in higher net effects than Alternative 1. This comparative analysis evaluated two route alternatives based on the interaction of their PDAs and the representative indicator measures, and did not consider the effects to physiography, terrain and soil VC at the local or regional scale (i.e., LSA or regional study area). The comprehensive assessment of net effects to the physiography, terrain and soils VC, will be completed on the preferred route selected, and may result in different determination of predicted net effects.</li> </ul>					
<b>Notes:</b>					
<ol style="list-style-type: none"> <li>The number of significant landforms noted is subjective and may be a conservative value. This measure will be re-evaluated with Indigenous Knowledge input, and information from the wildlife and vegetation disciplines. As a result, the data presented here may differ from the final effects analysis.</li> <li>Soil with a rating of Good, Fair or Poor were considered suitable for reclamation.</li> </ol>					
<ul style="list-style-type: none"> <li>Some numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.</li> </ul>					
<b>Ungulates</b>					
Moose	<ul style="list-style-type: none"> <li>Habitat availability</li> <li>Habitat distribution</li> </ul>	<ul style="list-style-type: none"> <li>Amount of high suitability moose habitat that would be impacted per segment alternative.</li> <li>Number and area of confirmed and suitable habitat features (i.e., suitable moose aquatic feedings areas, known mineral licks) that would be impacted per segment alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> <li>Alternative 1 minimizes the amount of high suitability that will be removed.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any high suitability habitat within the PDA, 0.2 ha of high suitability habitat within the PDA including a 500-m buffer and is not anticipated to disturb any suitable habitat features.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any high suitability habitat within the PDA, 0.6 ha of high suitability habitat within the PDA including a 500-m buffer and is not anticipated to disturb any suitable habitat features.<sup>1</sup></li> </ul>
Caribou	<ul style="list-style-type: none"> <li>Habitat availability</li> <li>Habitat distribution – includes spatial extent and distribution of GHD Category 1, 2, and 3 habitats (MNR, 2013) and availability and distribution of habitat which contain biophysical attributes necessary for caribou seasonal and life stage activities (ECCC 2019).</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of known and potential Category 1 GHD WINTER USE AREAS that would be impacted per segment alternative.</li> <li>Area (hectares) of known and potential Category 1 GHD NURSERY AREAS that would be impacted per segment alternative.</li> <li>Area (hectares) of known and potential Category 1 GHD TRAVEL CORRIDOR AREAS that would be impacted per segment alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Avoid sensory disturbances within 10 km of known high-use areas during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> <li>Alternative 1 minimizes the amount of winter use habitat that will be removed.</li> <li>Alternative 4 avoids the core areas (50% Kernel Density Estimation; KDE) of known or potential nursery areas.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat travel corridors; however, it is anticipated to disturb the following known and potential Category 1 GHD winter use areas and nursery areas: <ul style="list-style-type: none"> <li>Winter Use Areas: 612 ha within the PDA, 3,019 ha within the PDA including a 500-m buffer.<sup>1</sup></li> <li>Nursery Areas: 17 ha within the PDA, 134 ha within the PDA including a 500-m buffer.<sup>1</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat nursery areas or travel corridors; however, it is anticipated to disturb the following known and potential Category 1 GHD winter use areas: <ul style="list-style-type: none"> <li>Winter Use Areas: 440 ha within the PDA, 2,285 ha within the PDA including a 500-m buffer.<sup>1</sup></li> </ul> </li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<b>Summary of Ungulates:</b>					
<i>Overall</i>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Ungulates, as it is anticipated to remove approximately 175 ha less winter use habitat than Alternative 1, and does not remove any nursery area habitat.</li> <li>Alternative 1 is the least preferred route alternative from the perspective of Ungulates for Segment 2 – Albany Crossing.</li> <li>Both alternatives avoid high suitability moose habitat and known important habitat features. Less than 1 ha of moose high suitability habitat would be impacted within the 500 m indirect disturbance buffer around both alternatives.</li> <li>Both alternatives remove Category 1 caribou habitat, which are areas within the range which have lowest tolerance to alteration before their function in supporting caribou is compromised (MNR, 2013).</li> <li>Alternative 1 removes approximately 175 ha more winter use habitat than Alternative 4 (612 ha compared to 440 ha, respectively).</li> <li>Alternative 1 removes approximately 17 ha more nursery use habitat than Alternative 4 (17 ha compared to zero, respectively).</li> <li>Of note, when the 95% KDE polygons of nursery areas are evaluated, there is habitat impacted on both Alternative 1 and Alternative 4.</li> </ul>					
<i>Net Effects</i>					
<ul style="list-style-type: none"> <li>Both route alternatives are predicted to result in equivalent net effects for moose. Alternative 1 results in higher predicted net effects than Alternative 4 for caribou. It is important to note that both alternative segments for the Albany Crossing will remove caribou habitat, which may be depended on directly or indirectly for life processes, even if it is not considered Category 1. Indirect effects of habitat removal, including sensory disturbance, increased mobility for predators and hunters, and increased vehicle traffic, cannot be fully mitigated regardless of the Alternative segment. This comparative analysis evaluated the two route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to moose or caribou at the local or regional scale (i.e., LSA or regional study area). The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the ungulates will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul>					
<b>Notes:</b>					
<ol style="list-style-type: none"> <li>A 500 m buffer is used to capture indirect disturbances to habitat features such as noise and dust.</li> </ol> <ul style="list-style-type: none"> <li>Known Category 1 areas are derived from Ontario Government Caribou GHD for Forest-dwelling caribou (MNR, 2013). The identification of "potential new" Category 1 winter use areas and nursery areas is based on 50% KDE polygons derived from MFFN and Ministry of Natural Resources (MNR) collar data between 2020 to 2023. The 50% KDE represents the core area used during the date periods identified by Ontario for the current GHD Category 1 areas. "Potential new" travel corridors are derived from 95% KDE derived from MFFN and MNR collar data between 2020 and 2023. The 95% KDE was used for the travel corridors because travel corridors are more linear in extent and do not have core areas relative to winter use and nursery areas. In areas where travel corridors overlap winter use or nursery areas, they are not double counted in the calculation of habitat removed.</li> <li>This information may be re-evaluated with Indigenous Knowledge input and / or additional collar data, when available. As a result, the data presented here may differ from the final effects analysis.</li> </ul>					
<b>Wildlife</b>					
Bats (including SAR – Little Brown Myotis, Northern Myotis, Tri-coloured Bat)	<ul style="list-style-type: none"> <li>Species presence</li> <li>Relative abundance (spatially and temporally)</li> <li>Habitat availability and distribution (spatially and temporally) including critical habitat for SAR</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of moderate to high suitability bat maternity roost habitat disturbed per alternative.</li> <li>Area (hectares) of foraging habitat (open wetlands and waterbodies adjacent to roosting habitat).</li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable maternity roost habitat during the bat active season.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb: <ul style="list-style-type: none"> <li>185.61 ha of moderate to high suitability bat maternity roost habitat</li> <li>142.08 ha of foraging habitat</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb: <ul style="list-style-type: none"> <li>106.83 ha of moderate to high suitability bat maternity roost habitat</li> <li>12.5 ha of foraging habitat</li> </ul> </li> </ul>
Fur Bearers (American Marten)	<ul style="list-style-type: none"> <li>Species presence</li> <li>Relative abundance (spatially and temporally)</li> <li>Habitat availability and distribution (spatially and temporally) including critical habitat for SAR</li> </ul>	<ul style="list-style-type: none"> <li>Relative abundance of furbearers (American Marten)<sup>2</sup></li> <li>Area (hectares) of moderate / high-quality American Marten habitat disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 2.75 American Marten and is anticipated to disturb 634.47 ha of moderate / high-quality American Marten habitat.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 1.4 American Marten and is anticipated to disturb 653.6 ha of moderate / high-quality American Marten habitat.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
Fur Bearers (SAR Wolverine)		<ul style="list-style-type: none"> <li>Presence / relative abundance of wolverine females and individuals of unknown sex per alternative. Presence of observed denning areas (from field observations).<sup>1</sup></li> <li>Relative abundance of wolverine.<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 0.67 wolverine, the presence or abundance of 0 female wolverine and 1 wolverine individuals of unknown sex.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative has a relative abundance of 0.75 wolverine, the presence or abundance of 0 female wolverine and 1 wolverine individuals of unknown sex.</li> </ul>
Amphibians and Reptiles	<ul style="list-style-type: none"> <li>Species presence</li> <li>Relative abundance (if possible both spatially and temporally)</li> <li>Habitat availability and distribution (spatially and temporally)</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of high suitability breeding ecosites per alternatives (amphibians).</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 339.71 ha of high suitability breeding ecosites.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 299.2 ha of high suitability breeding ecosites.</li> </ul>

**Summary of Wildlife:**

**Overall**

- Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Wildlife, as it is anticipated that it would result in lower net effects on bats, amphibians, and potentially wolverine.
- Alternative 4 is the least preferred for alternative of Segment 2 – Albany Crossing, as it is anticipated that it would result in the higher net effects on bats, American marten, amphibians, and potentially wolverine.

Bats

- Alternative 4 is the most preferred for Bats, as it results in the least direct loss of both suitable bat maternity roost habitat and combined bat foraging and maternity roost habitat.
- Alternative 1 is the least preferred for Bats, as it results in the greatest direct loss of both suitable bat maternity roost habitat and combined bat foraging and maternity roost habitat.

Furbearers (American Marten)

- Alternative 1 is the most preferred for American Marten, as it results in the least direct loss of moderate / high-quality American marten habitat.
- Alternative 4 is the least preferred for American Marten, as it results in the greatest direct loss of moderate / high-quality American marten habitat.

Furbearers (wolverine)

- It is anticipated that Alternative 1 and Alternative 4 would have similar impacts on wolverine. Both alternatives had the same number of observations of female wolverine and wolverines of unknown sex. Alternative 4 has a slightly higher relative abundance of wolverine.

Amphibians and Reptiles

- Alternative 4 is the most preferred for Amphibians and Reptiles, as it results in the least direct loss of suitable amphibian breeding habitat.
- Alternative 1 is the least preferred for Amphibians and Reptiles, as it results in the greatest direct loss of suitable amphibian breeding habitat.

Net Effects

- Alternative 1 results in higher net effects than Alternative 4, due to its higher predicted effects on bats, and amphibians / reptiles. The difference in predicted net effects of each alternative on American marten and wolverine is insignificant. The predicted net effects have not considered all potential mitigation that may be applied. It is important to note that all route segments that bisect wolverine habitat have a direct effect as this species utilizes large home ranges and they rely on intact areas of wilderness directly or indirectly for life processes. Indirect effects of habitat removal for this species at risk, including sensory disturbance and increased vehicle traffic, cannot be fully mitigated regardless of the Alternative segment. As such, both alternatives may have a high potential net effect for wildlife. Net effect assessment is subject to change based on the implementation of additional mitigation. The comprehensive review of net effects for wildlife and wildlife habitat will be completed on the preferred route selected and may result in different determination of predicted net effects.

**Notes:**

- Female observations are split into the total number of known female animals observed per route segment. Wolverines of unknown sex are the sum of the total known animals with unknown sex and unidentifiable individuals. Unidentifiable individuals are assumed to be unique individuals.
- Relative abundance metrics are calculated as the average number of sightings (wolverine) or tracks (American marten) per station for stations that overlap route alternatives.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<b>Vegetation</b>					
Wetland and Riparian Ecosystems	<ul style="list-style-type: none"> <li>Availability (abundance spatially and temporally).</li> <li>Distribution.</li> <li>Function and Composition.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of wetland and riparian ecosystems disturbed per alternative.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Avoid using wetland and riparian areas for staging, where possible.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation and wetland protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 347.08 ha of wetland and riparian ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 352.24 ha of wetland and riparian ecosystems.</li> </ul>
Upland Ecosystems	<ul style="list-style-type: none"> <li>Availability (abundance spatially and temporally).</li> <li>Distribution.</li> <li>Function and Composition.</li> </ul>	<ul style="list-style-type: none"> <li>Number of upland ecosite types disturbed per alternative.<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 4 upland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 8 upland ecosite types.</li> </ul>
Traditional Use Plants and SAR Plant Populations (Including species with special conservation status or rarity in the province)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Accessibility to traditional use of plants.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of highly suitable and highly accessible (High = score of 1.5 – 2.0) habitat for traditional use plants disturbed per alternative.</li> <li>Area (hectares) of suitable habitat for SAR / SCC Plants (Black Ash, Northern Marsh Violet) disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 482.45 ha of highly suitable and highly accessible habitats for traditional use plants and 676.45 ha of suitable SAR / SCC habitat.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 391.58 ha of highly suitable and highly accessible habitats for traditional use plants and 219.74 ha of suitable SAR / SCC habitat.</li> </ul>
<b>Summary of Vegetation:</b>					
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 2 - Albany Crossing from the perspective of Vegetation.</b> While Alternative 1 represents a slightly smaller direct loss of wetland and riparian habitat the difference between both alternatives of 5.16 ha is considered negligible. Alternative 1 also represents a disturbance of fewer upland ecosite types; however, the smaller direct loss of highly suitable and highly accessible habitat for traditional use plants and the smaller impact to suitable SAR / SCC habitat is why Alternative 4 has been chosen as the preferred Alternative.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<u>Wetlands and Riparian Ecosystems</u>					
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred as it results in the least direct loss of wetland and riparian ecosystems.</li> <li>Alternative 4 is the least preferred as it results in the greatest direct loss of wetland and riparian ecosystems.</li> </ul>					
<u>Upland Ecosystems</u>					
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred as it disturbs the fewest upland ecosite types.</li> <li>Alternative 4 is the least preferred as it disturbs the greatest number of ecosite types.</li> </ul>					
<u>Traditional Use Plants and SAR / SCC Plant Populations</u>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred as it results in the least direct loss of highly suitable and highly accessible habitats for traditional use plants.</li> <li>Alternative 1 is the least preferred as it results in the greatest direct loss of highly suitable and highly accessible habitats for traditional use plants.</li> <li>Alternative 4 is the most preferred for SAR / SCC Plant Populations as it has the least impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).</li> <li>Alternative 1 is the least preferred SAR / SCC Plant Populations as it has the greatest impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).</li> </ul>					
<u>Net Effects</u>					
<ul style="list-style-type: none"> <li>Alternative 1 results in higher net effects than Alternative 4. This comparative analysis evaluated the two route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to vegetation VCs at the local or regional scale (i.e., LSA or regional study area). The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the vegetation VCs will be completed on the preferred route selected and may result in a different determination of predicted net effects to these individual VCs.</li> </ul>					
<b>Notes:</b>					
<ol style="list-style-type: none"> <li>Note that for the purposes of the alternatives assessment, only the availability of wetland and riparian ecosystems indicator was included. Area of loss as a metric was used because the area of direct impact would be the most important on the ecosystem. The more area that is removed, the less likely the ecosystem would be able to maintain its functions. The Distribution, Function and Composition Indicators will be addressed for the preferred alternative in the EA / IS Document.</li> <li>Number of ecosite types as a metric is proposed because this provides a measure of impact on forest biodiversity rather than just area which could be attributed to the overall length of the route alternative rather than where the alternative is specifically located. <ul style="list-style-type: none"> <li>The Project has taken a preliminary conservative approach to classifying SAR and SCC habitats and the mapping is based on a limited amount of field information. The mapping that informed this evaluation is expected to be refined for final reporting.</li> <li>This analysis is based on mapping that doesn't incorporate data collected during the 2023 field programs. This 2023 field information may refine the vegetation mapping that will be included in final reporting.</li> </ul> </li> </ol>					
<b>Birds</b>					
Species at Risk Forest and Wetland Birds  (e.g., Canada warbler, chimney swift, eastern whip-poor-will, eastern wood-pewee, evening grosbeak, olive-sided flycatcher, bank swallow, barn swallow, black tern, rusty blackbird, yellow rail).	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally) of species at risk.</li> <li>Habitat availability and distribution (spatially and temporally) including critical habitat (where known), where defined for SAR.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of moderate to high suitability bird species at risk habitat disturbed in the PDA.</li> <li>Area of provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.</li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable bird nesting habitat during the breeding bird period.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during the breeding bird period.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the moderate to high suitability habitat of the following bird species at risk: <ul style="list-style-type: none"> <li>Canada warbler: 527.5 ha;</li> <li>Chimney swift: 0.0 ha;</li> <li>Common nighthawk: 87.4 ha;</li> <li>Eastern whip-poor-will: 9.0 ha;</li> <li>Eastern wood-pewee: 185.6 ha;</li> <li>Evening grosbeak: 332.5 ha;</li> <li>Lesser yellowlegs: 322.0 ha;</li> <li>Olive-sided flycatcher: 83.4 ha;</li> <li>Bald eagle: 139.0 ha;</li> <li>Peregrine falcon: 0.0 ha;</li> <li>Short-eared owl: 4.1 ha;</li> <li>Bank swallow: 0.0 ha;</li> <li>Barn swallow: 0.0 ha;</li> <li>Black tern: 1.7 ha;</li> <li>Rusty blackbird: 349.6 ha; and</li> <li>Yellow rail: 4.1 ha.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the moderate to high suitability habitat of the following bird species at risk: <ul style="list-style-type: none"> <li>Canada warbler: 401.4 ha;</li> <li>Chimney swift: 0.0 ha;</li> <li>Common nighthawk: 66.9 ha;</li> <li>Eastern whip-poor-will: 20.5 ha;</li> <li>Eastern wood-pewee: 82.9 ha;</li> <li>Evening grosbeak: 438.7 ha;</li> <li>Lesser yellowlegs: 502.0 ha;</li> <li>Olive-sided flycatcher: 97.4 ha;</li> <li>Bald eagle: 321.1 ha;</li> <li>Peregrine falcon: 0.0 ha;</li> <li>Short-eared owl: 7.5 ha;</li> <li>Bank swallow: 0.0 ha;</li> <li>Barn swallow: 0.0 ha;</li> <li>Black tern: 6.9 ha;</li> <li>Rusty blackbird: 337.5 ha; and</li> <li>Yellow rail: 7.5 ha.</li> </ul> </li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
				<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.<sup>1</sup></li> </ul>
Raptors (e.g., bald eagle)	<ul style="list-style-type: none"> <li>Species presence</li> <li>Relative abundance (spatially and temporally)</li> <li>Habitat availability and distribution (spatially and temporally)</li> </ul>	<ul style="list-style-type: none"> <li>Number of habitat features and area (hectares) disturbed: <ul style="list-style-type: none"> <li>raptor nest locations; and</li> <li>stopover sites (if present).<sup>1</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Avoid sensory disturbances within 800 m of known bald eagle nests.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb known raptor nests or stopover sites.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb any stopover sites but is anticipated to disturb 3 bald eagle nests (99.6 ha).</li> </ul>
Shorebirds	<ul style="list-style-type: none"> <li>Species presence</li> <li>Relative abundance (spatially and temporally)</li> <li>Habitat availability and distribution (spatially and temporally)</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of confirmed and suitable habitat features disturbed (e.g., stopover sites).<sup>2,3,4</sup></li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable bird nesting habitat during the breeding bird period.</li> <li>Avoid clearing within 100 m of suitable stopover sites during the spring and fall bird migration period.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during the breeding bird, spring and fall bird migration periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1 suitable habitat features (45.8 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1 suitable habitat features (64.1 ha).</li> </ul>
Waterfowl	<ul style="list-style-type: none"> <li>Species presence</li> <li>Relative abundance (spatially and temporally)</li> <li>Habitat availability and distribution (spatially and temporally)</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of confirmed and suitable habitat features disturbed (e.g., stopover sites).<sup>2,3,4</sup></li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable bird nesting habitat during the breeding bird period.</li> <li>Avoid clearing within 100 m of suitable stopover sites during the spring and fall bird migration period.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during the breeding bird, spring and fall bird migration periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1 suitable habitat feature (92.7 ha).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1 suitable habitat feature (114.6 ha).</li> </ul>

**Summary of Birds:**

Overall

- Alternative 1 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Birds, as it is anticipated that it would result in the lowest net effects on bird species at risk, raptors, shorebirds, and waterfowl.

Species at Risk

- Alternative 1 is the most preferred for Species at Risk, as it results in the least direct loss of moderate to high suitability habitat for bird species at risk.
- Alternative 4 is the least preferred for Species at Risk, as it results in the greatest direct loss of moderate to high suitability habitat for bird species at risk.
- Alternative 1 and Alternative 4 both avoid the direct loss of any provincial ESA regulated habitat or federal SARA critical habitat for species at risk birds.
- Alternative 1 minimizes the amount of moderate to high suitability bird species at risk habitat that will be removed (avoidance measure).

Raptors

- Alternative 1 is the most preferred for Raptors, as it results in no direct loss of habitat features for raptors (i.e., raptor nest locations and their associated buffers, stopover sites).
- Alternative 4 is the least preferred for Raptors, as it results in the greatest direct loss of habitat features for raptors.
- Alternative 1 avoids the removal of known raptor nests.
- Alternative 1 and Alternative 4 avoid the removal of potential stopover sites.<sup>1</sup>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<u>Shorebirds</u>					
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Shorebirds, as it results in the least direct loss of suitable habitat features for shorebirds (e.g., stopover sites).</li> <li>Alternative 4 is the least preferred for Shorebirds, as it results in the greatest direct loss of suitable habitat features for shorebirds.</li> <li>Alternative 1 minimizes the amount of suitable habitat features that will be removed (avoidance measure).<sup>2,3,4</sup></li> </ul>					
<u>Waterfowl</u>					
<ul style="list-style-type: none"> <li>Alternative 1 is the most preferred for Waterfowl, as it results in the least direct loss of suitable habitat features for waterfowl (e.g., stopover sites).</li> <li>Alternative 4 is the least preferred for Waterfowl, as it results in the greatest direct loss of suitable habitat features for waterfowl.</li> <li>Alternative 1 minimizes the amount of suitable habitat features that will be removed (avoidance measure).<sup>2,3,4</sup></li> </ul>					
<u>Net Effects</u>					
<ul style="list-style-type: none"> <li>Alternative 4 results in higher net effects than Alternative 1. This comparative analysis evaluated the two route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to bird VCs at the local or regional scale (i.e., LSA or regional study area). The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the bird VCs will be completed on the preferred route.</li> </ul>					
<b>Notes:</b>					
<ol style="list-style-type: none"> <li>Stopover sites for raptors were defined as waterbodies and watercourses surveyed during baseline field surveys with greater than 2 observations of raptors.</li> <li>The Natural Heritage Information Centre (NHIC) was searched for known provincial waterfowl and shorebird staging areas. No data were found for these measures.</li> <li>Suitable habitat features for shorebirds and waterfowl were defined as waterbodies and watercourses surveyed during baseline field surveys.</li> <li>Confirmed habitat features for shorebirds and waterfowl were defined as waterbodies and watercourses surveyed during baseline field surveys plus a 100 m buffer where shorebirds or waterfowl were observed during baseline field surveys.</li> </ol>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Acoustic and Vibration Environment</b>					
Acoustic and Vibration Environment	<ul style="list-style-type: none"> <li>Change to noise and vibration</li> </ul>	<ul style="list-style-type: none"> <li>PDA footprint area</li> <li>Total road length</li> <li>Number of sensitive points of reception (PORs) within 500 m of the roadway</li> </ul>	<ul style="list-style-type: none"> <li>Comply with local municipal noise by-laws and the Ministry of the Environment, Conservation and Parks' <i>Model Municipal Noise Control Bylaw</i> (i.e., NPC-115).</li> <li>Generally, limit construction activities to the daytime period (i.e., 07:00 to 19:00) where possible. If nighttime construction activities are required, a review of whether additional mitigation measures are needed should be carried out.</li> <li>Maintain equipment and machinery used on site in good working conditions through regular maintenance and inspection.</li> <li>Design access roads to minimize reversing, which is expected to minimize use of backup beepers, where possible.</li> <li>Locate and operate construction equipment as far as possible from PORs.</li> <li>Notify Indigenous communities, landowners, and relevant stakeholders of the planned construction schedule before the start of construction and prior to specific activities that may be noisy or generate vibration.</li> <li>Investigate noise or vibration concerns as they arise through a complaint resolution mechanism whereby persons can contact the proponent if there are perceived noise or vibration issues.</li> <li>Operate vehicles and equipment such that impulsive noise is minimized, where possible.</li> <li>Develop a construction vibration work plan prior to the start of construction describing the construction schedule, list of construction equipment, list of POR locations, applicable guidance documents including criteria and municipal by-laws (i.e., residential, heritage structures and utilities) and control measures.</li> <li>Avoid operating equipment expected to be a significant source of vibration simultaneously. Vibration levels could be less when operating separately.</li> <li>Construction blasting will be carried out in compliance with OPSS 120 and NPC-119. All blasts which might impact local structures or disrupt humans should be monitored for ground and air vibrations.</li> <li>Aggregate pit blasting will be carried out to comply with the conditions provided in the license or aggregate permit.</li> <li>Blasting delays and blast mats will be used, as appropriate, to control vibration and fly rock as required.</li> </ul>	<ul style="list-style-type: none"> <li>The PDA for this alternative is 676 ha, with a total road length of 27.5 km. There are 105 potential PORs within 500 m of the roadway that could be impacted by noise and vibration.</li> </ul>	<ul style="list-style-type: none"> <li>The PDA for this alternative is 749 ha, with a total road length of 23.2 km. There are 170 potential PORs within 500 m of the roadway that could be impacted by noise and vibration.</li> </ul>

**Summary of Acoustic and Vibration Environment:**

Overall

- Alternative 1 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Acoustic and Vibration Environment as it has the smallest PDA footprint, shortest road length, and smallest number of potential PORs within 500 m of the roadway.
- Alternative 4 is the least preferred route alternative for Segment 2 – Albany Crossing from the perspective of Acoustic and Vibration Environment as it has the largest PDA footprint, longest road length, and largest number of potential PORs within 500 m of the roadway.
- In general, the larger the PDA footprint, the higher the likelihood of a larger number of potential PORs located in the acoustic environment study areas.
- In general, the longer the road, the higher the likelihood of a larger number of potential PORs exposed to noise from Project operations (i.e., a longer-term effect).
- In general, the more potential PORs within 500 m of the roadway, the higher the likelihood of a larger number of potential PORs exposed to noise from the Project. Note that the POR counts above are based on a preliminary review and the specific land uses have not been confirmed to be noise or vibration sensitive.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4	
<b>People</b>						
<u>Net Effects</u>						
<ul style="list-style-type: none"> <li>It is expected that each of the route alternatives can be designed such that the outcome of the acoustic and vibration environment assessment of net effects would be equal. As such, net effects from each alternative are predicted to be equivalent. This comparative analysis evaluated the route alternatives based on the PDAs, road length, and a preliminary analysis of the number of potential PORs within 500 m of the roadway and did not consider the expected Project noise and vibration levels in the LSA or the proximity of potential PORs to the Project. The comprehensive review of potential PORs and assessment of net effects for the acoustic and vibration environment will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul>						
<b>Atmospheric and GHG</b>						
Air Quality and GHG	Number of sensitive receptors within 500 m of the roadway	Number	<ul style="list-style-type: none"> <li>Air Quality Mitigation Options: <ul style="list-style-type: none"> <li>maintain and keep equipment in proper working order;</li> <li>use fuel efficient equipment where possible;</li> <li>avoid idling where possible and develop an anti-idling policy;</li> <li>optimize material selection, procurement and shipping;</li> <li>implement fugitive dust controls such as scheduled road watering, stockpile watering or covering erodible surfaces where appropriate;</li> <li>implement proper storage and handling procedures of fuel;</li> <li>optimize blasting and land clearing activities to reduce overall fuel and explosive usage;and</li> <li>where possible reuse or salvage wood materials to prevent burning activities for disposal.</li> </ul> </li> <li>GHG Mitigation Options: <ul style="list-style-type: none"> <li>maintain and keep equipment in proper working order;</li> <li>use fuel efficient equipment where possible;</li> <li>avoid idling where possible and develop an anti-idling policy;</li> <li>optimize material selection, procurement and shipping;</li> <li>consider carbon offsets through reforestation;</li> <li>where possible reduce the amount of land clearing or disturbance activities; and</li> <li>strategically develop construction and equipment usage schedules to reduce overall fuel consumption.</li> </ul> </li> </ul>	105	170	
	Land use type which is disturbed based on route selection (i.e., wetland, forest type, peatlands, etc.)	Bedrock (ha)			-	-
		Treed (ha)			423	866
		Water (ha)			13	26
		Wetland (ha)			241	337
Operating equipment needed for each route selection (if one route selection requires increased construction efforts)	Length of Road (km)		27.48	23.23		
Overall road / clearing area of each route selection	Area (Ha)		676.45	1,228.57		
<b>Summary of Atmospheric and GHG:</b>						
<u>Overall</u>						
<ul style="list-style-type: none"> <li><b>Alternative 1 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Atmospheric and GHG</b> – this is based on Alternative 1 having the least number of sensitive receptors and least amount of project area disturbed.</li> <li>Total number of receptors which may be impacted by air quality emissions from the project is lowest for Alternative 1. It should be noted that receptor location may influence the magnitude of effects experienced at each receptor.</li> <li>At this time, it is unknown based on land classification changes the potential impacts that carbon sinks and sequestrations will have on overall GHG emissions. Based on data available at this time, Alternative 1 has the least disturbed area of carbon sinks. The magnitude of loss of carbon sinks will vary based on the specifics of each land use characteristics.</li> <li>The length of road segment is lower for Alternative 4, and this may result in a decrease in air quality and GHG emissions during construction phases. The total road length may or may not influence operating equipment duration based on route specific construction requirements.</li> <li>The total area required to be cleared is lowest for Alternative 1, and this may result in a decrease in air quality and GHG emissions during the construction phase.</li> </ul>						
<u>Net Effects</u>						
<ul style="list-style-type: none"> <li>The predicted net effects for each alternative were evaluated as equivalent relative to each other. The net effect rating is subject to change pending on detailed modelling / calculations as well as implementation of additional mitigation.</li> </ul>						

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Cultural Heritage</b>					
Archaeological Sites and Resources	• Previously identified archaeological sites	<ul style="list-style-type: none"> <li>• The net effects to archaeological resources will be evaluated</li> </ul> OR <ul style="list-style-type: none"> <li>• Number of previously identified archaeological sites</li> <li>• Areas of cultural significance raised by local Indigenous Nations</li> <li>• Number of resources identified</li> </ul>	• Complete all outstanding archaeological assessments.	• No registered archaeological sites, however archaeological potential is present within much of the alternative.	• Registered archaeological site nearby.
	• Areas of cultural significance raised by local Indigenous Nations		• Complete all outstanding archaeological assessments. • Incorporate information received by Indigenous Nations in reporting. • Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. In addition, consultation with relevant Indigenous communities will be initiated in the event that archaeological resources or human remains are discovered.	• Area has raised cultural significance by local Indigenous Nations.	• Area has raised cultural significance by local Indigenous Nations.
	• Proximity to water		• Complete all outstanding archaeological assessments.	• Archaeological potential is present within much of the alternative.	• Archaeological potential is present within much of the alternative.
	• Soil texture and drainage		• Complete all outstanding archaeological assessments.	• Archaeological potential is present within much of the alternative.	• Archaeological potential is present within much of the alternative.
	• Glacial geomorphology, elevated topography		• Complete all outstanding archaeological assessments.	• Archaeological potential is present within much of the alternative.	• Archaeological potential is present within much of the alternative.
	• Resource areas including food or medicinal plants, scarce raw materials		• Complete all outstanding archaeological assessments.	• Area has food or medicinal plant resources.	• Area has food or medicinal plant resources.
	• Areas of early 19th century settlement and transportation routes		• Complete all outstanding archaeological assessments.	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source.	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source.
	• Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants		• Complete all outstanding archaeological assessments.	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source.	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source.
				<b>No discernable difference between alternatives</b>	<b>No discernable difference between alternatives</b>
Built Heritage Resources / Cultural Heritage Landscapes	• Animal, Fish, and Plant Harvest Areas (MFFN)	<ul style="list-style-type: none"> <li>• The net effects to built heritage resources and cultural heritage landscapes will be evaluated in the Cultural Heritage Report.</li> <li>• Number of resources identified.</li> </ul>	<ul style="list-style-type: none"> <li>• Where possible, avoid direct adverse impacts to Animal, Fish and Plant Harvest Areas.</li> <li>• If direct adverse impacts are anticipated to an Animal, Fish, and Plant Harvest Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	<ul style="list-style-type: none"> <li>• Residual effects for this alternative include the potential impact of up to 35 identified Animal, Fish, and Plant Harvest Areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Residual effects for this alternative include the potential impact of up to 35 identified Animal, Fish, and Plant Harvest Areas.</li> </ul>
				<b>HIGH RESIDUAL EFFECT</b> <b>No discernable difference</b>	<b>HIGH RESIDUAL EFFECT</b> <b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
	• Cultural, Spiritual, and Sacred Areas (MFFN)		• Where possible, avoid direct adverse impacts to Cultural, Spiritual, and Sacred Areas. • If direct adverse impacts are anticipated to a Cultural, Spiritual, and Sacred Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).	• Residual effects for this alternative include the potential impact of up to 20 identified Cultural, Spiritual, and Sacred Areas.	• Residual effects for this alternative include the potential impact of up to 15 identified Cultural, Spiritual, and Sacred Areas
				<b>MODERATE RESIDUAL EFFECT Least Preferred</b>	<b>MODERATE RESIDUAL EFFECT Most Preferred</b>
	• Habitation Areas (MFFN)		• Where possible, avoid direct adverse impacts to Habitation Areas. • If direct adverse impacts are anticipated to a Habitation Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).	• Residual effects for this alternative include the potential impact of up to 20 identified Habitation Areas	• Residual effects for this alternative include the potential impact of up to 10 identified Habitation Areas
				<b>MODERATE RESIDUAL EFFECT Least Preferred</b>	<b>LOW RESIDUAL EFFECT Most Preferred</b>
	• Travel (MFFN and Historical Maps)		• Where possible, avoid direct adverse impacts to Travel Areas. • If direct adverse impacts are anticipated to a Travel Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).	• Residual effects for this alternative include the potential impact of 1 identified historical Indigenous Trail and 1 historical portage route.	• Residual effects for this alternative include the potential impact of 1 identified historical Indigenous Trail and 1 historical portage route.
				<b>MODERATE RESIDUAL EFFECT No discernable difference</b>	<b>MODERATE RESIDUAL EFFECT No discernable difference</b>

**Summary of Cultural Heritage:**

Overall

- **Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Cultural Heritage.**
- There is a negligible difference between the alternatives.

Archaeological Sites and Resources

- No discernible difference between the alternatives is present, as the alternatives retain much archaeological potential that must be mitigated prior to ground disturbance.
- One registered archaeological site nearby Alternative 4, and no registered archaeological sites nearby Alternative 1. Despite this indicator, archaeological potential within much of both alternatives remains to be mitigated, and as such they are equally ranked.

Built Heritage Resources / Cultural Heritage Landscapes

- Although both alternatives have the potential to impact identified cultural heritage resources, Alternative 4 is preferred due to its lower net effects to cultural heritage resources.
- Alternative 1 has the potential to disturb more identified Cultural, Spiritual, and Sacred Areas and more Habitation Areas than Alternative 4.

Net Effects

- The predicted net effects were evaluated as equivalent for both alternatives due to their effects on areas of raised cultural significance by local Indigenous nations, archaeological potential present, food / medicinal plant resources, Albany River as a potable water source, and disturbance of Harvest Areas. The predicted net effects have not considered all potential mitigation that may be applied. Net effect assessment is subject to change based on the implementation of additional mitigation. There is a negligible difference between the alternatives in terms of the cultural heritage VC because archaeological potential is present within much of the alternatives.
- The net effects assessment for Cultural Heritage employs its own, discipline-relevant methodology which only uses data relevant for cultural heritage purposes, and not the full data set used in this table. Any apparent discrepancies in the data are therefore methodological in origin and are confined to the cultural heritage report (a more detailed explanation is in the draft Cultural Heritage Report: Existing Conditions & Preliminary Impact Assessment). To illustrate cultural heritage themes, a series of heat maps were created using the Indigenous Knowledge categories obtained from MFFN, in addition to potential cultural heritage resources identified during the cultural heritage field review and a historic mapping review. The cultural heritage data set therefore differs in some areas from the data set from originally collected by Dillon. To generate the heat maps, a 5 km square grid was applied across the LSA, and colour coded to illustrate data point concentrations and areas of interest in proximity to the Route Alternatives for the Project. Data points were included according to the 5 km grid, not just the LSA. The heat maps depict Indigenous Knowledge data point frequency in numerical ranges of 5 (e.g.,0-5, 6-10, 11-15), with each range represented in a different colour. The cultural heritage assessment of potential impacts for each alternative was based on the maximum potential impacts as depicted on the heat maps rather than a precise account of individual data points. Neither did the cultural heritage assessment differentiate between direct or indirect impacts, but broadly screened for any potential impacts along the route alternatives. The cultural heritage impact assessment for the preferred route includes a more precise treatment of the relevant data, excluding data points outside the LSA and assessing direct versus indirect impacts within the LSA.

**Notes:**

- For consistency, Cultural Heritage indicators have been revised from those presented in the Study Plan to be consistent with the Indigenous Knowledge data points used to develop the cultural heritage themes for the Cultural Heritage Report.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Visual</b>					
Visual	Change in landscape character	<ul style="list-style-type: none"> <li>• Visibility of project from identified valued / sensitive receptor locations (Albany River).</li> <li>• Change in landscape character will result in the change / impact to the existing visual environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize disturbance to the surrounding landscape including; Peatland, Vegetation, Terrain, and Surface Water.</li> <li>• Minimize the creation on open vistas to reduce visibility of proposed community access road.</li> <li>• Implement progressive reclamation and revegetation of disturbed areas no longer required following construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Proximity to Albany River has potential for great visual impact</li> </ul>	<ul style="list-style-type: none"> <li>• Less impact compared to Alternative 1 given the distance to Albany River</li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>
				<ul style="list-style-type: none"> <li>• See below anticipated impacts to changes in landscape character</li> </ul>	<ul style="list-style-type: none"> <li>• See below anticipated impacts to changes in landscape character</li> </ul>
	Proximity to and number of sensitive sites	<ul style="list-style-type: none"> <li>• Alteration / change in or loss of culturally important sites and areas (e.g., ceremonial sites, place names, teaching sites, archaeological sites)</li> <li>• Visibility of Cultural, Spiritual, and Sacred Areas (MFFN)</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid and / or screen sensitive sites and features</li> <li>• Minimize disturbance and proximity of road to sensitive receptors including known cultural and spiritual significant places</li> </ul>	<ul style="list-style-type: none"> <li>• Requires Indigenous Knowledge team input and Cultural Heritage team input.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires Indigenous Knowledge team input and Cultural Heritage team input.</li> </ul>
	Degree of Visual Contrast	<ul style="list-style-type: none"> <li>• Amount of Visual Disturbance</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize disturbance and extent of infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Requires visibility mapping / modelling</li> </ul>	<ul style="list-style-type: none"> <li>• Requires visibility mapping / modelling</li> </ul>
Change in Landscape Character: Surface Water Features	<ul style="list-style-type: none"> <li>• Significant bridge crossings that will need to be installed over water crossing and alter landscape as well as visual environment.</li> <li>• Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features (e.g., traditional land uses).</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize bridge crossings that will span greater distances as it will have the greatest amount of visual impact.</li> <li>• Minimize the amount of bridge crossings needed that will be seen from potential sensitive receptors.</li> <li>• Strategically locate bridge crossings within forested areas or visually screen with forest canopy.</li> </ul>	<ul style="list-style-type: none"> <li>• Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>○ cross 7 waterbodies, all of which are inferred as permanent;</li> <li>○ cross 5 waterbodies (27,332 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>○ cross 3 waterbodies (26,800 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>○ cross 8 waterbodies, all of which are inferred as permanent;</li> <li>○ cross 6 waterbodies (12,580 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>○ cross 3 waterbodies (12,050 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	
Change in Landscape Character: Vegetation and Ecosystems	<ul style="list-style-type: none"> <li>• Area of wetland, riparian and upland ecosystems disturbed, altering the visual environment.</li> <li>• Area of wetland, riparian and upland ecosystems disturbed, affecting traditional land uses.</li> <li>• Visual alternation of cultural and spiritual significant places.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize disturbance of existing vegetation and various ecosystems which will alter the visual environment.</li> <li>• Consult with Indigenous communities of any disturbed sites and land uses that may be visually impacted by the community access road.</li> <li>• Implement reclamation, revegetation and compensation practices of disturbed areas after the construction of the community access road.</li> <li>• Strategically locate road within forested areas to visually mitigate views of the community access road and minimize open areas and upland areas that have greater visual impact.</li> </ul>	<ul style="list-style-type: none"> <li>• Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>○ this alternative is anticipated to disturb 347.08 ha of wetland and riparian ecosystems;</li> <li>○ this alternative is anticipated to disturb 4 upland ecosite types; and</li> <li>○ this alternative is anticipated to disturb 344.85 ha of peatland and 10 peatland ecosite types.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>○ this alternative is anticipated to disturb 352.24 ha of wetland and riparian ecosystems;</li> <li>○ this alternative is anticipated to disturb 8 upland ecosite types; and</li> <li>○ this alternative is anticipated to disturb 302.38 ha of peatland and 6 peatland ecosite types.</li> </ul> </li> </ul>	

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Summary of Visual:</b>					
<i>Overall</i>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Visual as it results in less visual impact than Alternative 1.</li> <li>Alternative 1 and Alternative 4 have a similar amount of potential water crossings.</li> <li>Alternative 1 and Alternative 4 have a similar anticipated net impact to landscape character (disturbance of wetland / riparian ecosystems, upland ecosystems and peatland).</li> <li>Alternative 1 is adjacent the Albany River and has the potential to create a higher visual impact.</li> <li>Alternative 1 is shown to have higher visual impact to Traditional Indigenous land uses and significant locations.</li> <li>Alternative 4 is shown to disturb a greater amount of forest types but will offer greater visual mitigation because of the forest cover.</li> </ul>					
<i>Net Effects</i>					
<ul style="list-style-type: none"> <li>Implementation of the community access road will alter the existing landscape character, and as a result alter the visual environment. Degree of visual contrast and affected sensitive receptors will be determined with visibility mapping / modelling. Based on anticipated change in landscape character of surface water features, Alternative 4 results in the lowest net effects while Alternative 1 results in the highest net effects. Based on anticipated changes in landscape character of vegetation and ecosystems, Alternative 1 results in lower net effects while Alternative 4 results in a moderately higher net effect to the visual environment.. Alternative 1 will have the overall higher net effect to the visual environment because of its location and proximity to the Albany River.</li> </ul>					
<b>Human Health and Community Safety</b>					
Public Safety	<ul style="list-style-type: none"> <li>Road Use Accident.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for roadway related accidents as a result of the road project including vehicles and pedestrians.</li> </ul>	<ul style="list-style-type: none"> <li>Post “no entry”, warning signs and barricades (e.g., gates, fences), where necessary, around active construction sites; warning signs and reduced speed limits to be established at known wildlife crossing locations; warning signs and lights to be displayed for road maintenance equipment and trail crossings.</li> <li>Provide for safe access for trappers and other traditional users.</li> </ul>	<ul style="list-style-type: none"> <li>The development and use of the road has the potential to result in net effects to public safety including road related accidents. All route segments are considered to have relatively equal potential for accidents.</li> </ul>	<ul style="list-style-type: none"> <li>The development and use of the road has the potential to result in net effects to public safety including road related accidents. All route segments are considered to have relatively equal potential for accidents.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
Environmental Factors Influencing Human Health and Community Safety	<ul style="list-style-type: none"> <li>Country Foods.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for change in the quality and quantity (abundance) of country foods.</li> </ul>	<ul style="list-style-type: none"> <li>Reclaim and rehabilitate areas disturbed by construction to encourage natural regeneration / regrowth of vegetation and habitat restoration.</li> <li>Community input into alignment routing, component siting and road design avoid important areas of botanical and wildlife resources that serve as country foods to the extent feasible.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road has the potential to result in net effects to the abundance of harvested species which could impact country food consumption by Indigenous communities.</li> <li>Moose is understood to be an important species that is harvested by First Nations. The PDA for this segment contains only 0.2 ha of high suitability moose habitat.</li> <li>It is unknown if Caribou is currently harvested in the LSA and therefore is not considered in this evaluation in regard to country foods.</li> <li>All route segments cross the same number of watercourses (6) involving in-water works and would have similar impact on fish that may be harvested.</li> <li>Information on how the quality of harvested species could be affected by the road is not known at this time and will be assessed as part of the project impact assessment.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road has the potential to result in net effects to the abundance of harvested species which could impact country food consumption by Indigenous communities.</li> <li>Moose is understood to be an important species that is harvested by First Nations. The PDA for this segment contains only 0.2 ha of high suitability moose habitat.</li> <li>It is unknown if Caribou is currently harvested in the LSA and therefore is not considered in this evaluation in regard to country foods.</li> <li>All route segments cross the same number of watercourses (6) involving in-water works and would have similar impact on fish that may be harvested.</li> <li>Information on how the quality of harvested species could be affected by the road is not known at this time and will be assessed as part of the project impact assessment.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Summary of Human Health and Community Safety:</b>					
<i>Overall</i>					
<ul style="list-style-type: none"> <li>Both alternatives are equally preferred.</li> <li>All route segments will provide connection to the Marten Falls community and result in the same health impacts to the community including for example access to health services, changed to social and economic structures, mental well-being, etc.</li> <li>Generally, potential effects to the human health and community safety at the local or regional scale is considered similar for all the alternative routes.</li> <li>Only two human health and community safety indicators were considered to have relevance considering the character of the study area and data availability: road use accidents and country food availability.</li> <li>There is a negligible difference between the two route alternatives considering public safety and changes to country food availability.</li> <li>All route segments are considered equal with respect to impacts on Indigenous women including human trafficking.</li> <li>There are no permanent places of residence in proximity to the route segments that could be impacted in noise and air quality changes that might result in health impacts.</li> <li>Alternatives are equally ranked as both contain very limited area of moose habitat within the PDA, therefore having minimal moose habitat effects. Moose is an important country food source for local Indigenous communities.</li> <li>Similarly, both routes impact same / similar amount of fish habitat and are expected to have similar impact on country food availability.</li> </ul>					
<i>Net Effects</i>					
<ul style="list-style-type: none"> <li>Both route alternatives were evaluated as having equivalent net effects. A comprehensive assessment of net effects to human health and community safety will be completed on the preferred route and may result in a different determination of predicted net effects to the VC.</li> </ul>					
<b>Social</b>					
<b>Summary of Social:</b>					
<i>Overall</i>					
<ul style="list-style-type: none"> <li>There is a negligible difference between the alternative routes and are both ranked equal from a social-community perspective.</li> <li>All route segments will provide connection to the Marten Falls community and provide the same expected net social impact to the community.</li> <li>Social-community impacts from the Community Access Road are anticipated to be focused on the communities located with the LSA including MFFN, Aroland First Nation, and Greenstone.</li> <li>The potential for social impacts (e.g., change in housing demand / supply, community well-being, etc.) is expected to be the same in all the LSA communities for all route alternatives.</li> <li>No specific social-community features were identified in proximity to the alternative route segments that could be impacted.</li> <li>See Aboriginal and Treaty Rights and Interests for identification of features identified through the Indigenous Knowledge collection program.</li> </ul>					
<b>Land and Resource Uses</b>					
Land Use Compatibility	<ul style="list-style-type: none"> <li>Binary alignment with established planning policy requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Description.</li> </ul>	<ul style="list-style-type: none"> <li>No applicable measures due to absence of land use designations.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative route segments do not pass through any lands with land use designations. All route segments are on crown owned lands and are subject to the same provincial policies.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative route segments do not pass through any lands with land use designations. All route segments are on crown owned lands and are subject to the same provincial policies.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
Parks and Protected Areas	<ul style="list-style-type: none"> <li>Number and area of parks and protected areas impacted.</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of Park and Protected area with natural, cultural or recreation values impacted.</li> </ul>	<ul style="list-style-type: none"> <li>Limit clearing and use of land within parks and protected lands as much as possible. Temporary work areas such as staging areas should be located outside of parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could result in net effects including the loss of designated parkland area and disturb use of adjacent parkland.</li> <li>This segment crosses into the Albany River Provincial Park and contains 109.24 ha of park land within the PDA.</li> <li>Lowest relative impact on parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could result in net effects including the loss of designated parkland area and disturb use of adjacent parkland.</li> <li>This segment crosses into the Albany River Provincial Park and contains 238.91 ha of park land within the PDA.</li> <li>Greatest relative impact on parks and protected areas.</li> </ul>
				<b>Most Preferred</b>	<b>Least Preferred</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
	<ul style="list-style-type: none"> <li>Accessibility to parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>Extent to which access to parks and protected areas is increased.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor and limit the development of any side trails / roads that might extend into parks and protected areas.</li> <li>Work with Ontario Parks regarding any measures to control access into parks and protected areas as applicable.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could have net effects that change access levels to existing parks. The net effects of this are dependent on the proximity of the road to the park and nature of the park.</li> <li>This segment would provide 0.56 km of new access to Albany River Provincial Park which is a remote waterway park. Road access would contribute to a change in the character of this park.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could have net effects that change access levels to existing parks. The net effects of this are dependent on the proximity of the road to the park and nature of the park.</li> <li>This segment would provide 0.57 km of new access to Albany River Provincial Park which is a remote waterway park. Road access would contribute to a change in the character of this park.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
Recreation and Tourism	<ul style="list-style-type: none"> <li>Accessibility to lands and waterways used for recreation and tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Change to access to land utilized for recreation and / or tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a land / waterbody access plan to determine need for any access restrictions and / or access enhancements to promote recreation and tourism in the area.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access levels to current remote lands and water resources that could provide new recreation and tourism opportunities.</li> <li>All segments provide greater access to lands that are currently inaccessible, and which could be used for recreation purposes. Lands associated with this route segment are not considered to have more recreation value than other route segments. No information has been shared by stakeholders to suggest otherwise.</li> <li>Recreational users (e.g., snowmobilers, hikers, canoe / kayak users, etc.) would benefit from greater access to previously inaccessible lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access levels to current remote lands and water resources that could provide new recreation and tourism opportunities.</li> <li>All segments provide greater access to lands that are currently inaccessible, and which could be used for recreation purposes. Lands associated with this route segment are not considered to have more recreation value than other route segments. No information has been shared by stakeholders to suggest otherwise.</li> <li>Recreational users (e.g., snowmobilers, hikers, canoe / kayak users, etc.) would benefit from greater access to previously inaccessible lands.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
		<ul style="list-style-type: none"> <li>Change in waterway navigability including for recreation and tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Change in waterway navigability including for recreation and tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> </ul>	<ul style="list-style-type: none"> <li>The development of bridges over watercourses could negatively affect navigation.</li> <li>Both segments cross a similar number of waterbodies (7-8). Net effects to navigation are expected to be minimal.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
	<ul style="list-style-type: none"> <li>Environmental conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Change in environmental conditions that could change attractiveness of the area for tourism and recreation.</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Measures to avoid unnecessary vehicle and machine idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The road development and its operation could result in disturbance net effects such as runoff that could negatively affect the quality of the adjacent environment and affect its attractiveness for recreation.</li> <li>All segments are expected to result in similar change to environmental conditions that could result in effects to lands used for recreation.</li> </ul>	<ul style="list-style-type: none"> <li>The road development and its operation could result in disturbance net effects such as runoff that could negatively affect the quality of the adjacent environment and affect its attractiveness for recreation.</li> <li>All segments are expected to result in similar change to environmental conditions that could result in effects to lands used for recreation.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
			<ul style="list-style-type: none"> <li>○ Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>○ Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas a minimum of 30 m from waterbodies.</li> <li>○ Wash water from vehicles and equipment will not be allowed to enter a waterbody and will be conveyed to areas for infiltration, treated prior to discharge to the receiving environment, or hauled off-site.</li> <li>○ Minimize vegetation clearing to only what is required for construction and staging.</li> <li>○ Incorporate standard tree protection and ESC measures.</li> <li>○ Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>● MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>		
	<ul style="list-style-type: none"> <li>● Availability of species harvested for recreation purposes.</li> </ul>	<ul style="list-style-type: none"> <li>● Change to target species populations harvested for recreation purposes.</li> </ul>	<ul style="list-style-type: none"> <li>● Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>○ Development and implementation of a CEMP by the Contractor.</li> <li>○ Adherence to in-water work timing windows.</li> <li>○ Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>○ Adherence to DFO's <i>Measures to Protect Fish and Fish Habitat</i> (DFO, 2023).</li> <li>○ Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>○ Measures to avoid unnecessary idling to minimize emissions and GHGs.</li> <li>○ Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>○ Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>○ Measures to limit the spread and / or introduction of invasive species.</li> <li>○ Develop a land / waterbody access plan to determine need for any access restrictions.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● The development and operation of the road could have net effects that change the abundance of species that are harvested for recreation.</li> <li>● The natural science team is not able to provide an estimation regarding the extent to which the populations of species harvested might change. Change to their habitat is used as a surrogate measurement – see indicator below.</li> </ul>	<ul style="list-style-type: none"> <li>● The development and operation of the road could have net effects that change the abundance of species that are harvested for recreation.</li> <li>● The natural science team is not able to provide an estimation regarding the extent to which the populations of species harvested might change. Change to their habitat is used as a surrogate measurement – see indicator below.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
		<ul style="list-style-type: none"> <li>Change to the habitat for these target species.</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include:               <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to in-water work timing windows.</li> <li>Adherence to blasting measures in accordance with the <i>Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters</i> (Wright and Hopky, 1998).</li> <li>Adherence to DFO's <i>Measures to Protect Fish and Fish Habitat</i> (DFO, 2023).</li> <li>Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>Measures to avoid unnecessary idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Measures to limit the spread and / or introduction of invasive species.</li> <li>Develop a land / waterbody access plan to determine need for any access restrictions.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could remove habitat of key valued species could reduce the abundance of these species for recreation harvesting.</li> <li>Moose is a key wildlife species that is recreationally hunted. The PDA for this segment contains minimal area of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>All route segments cross a similar number of watercourses involving in-water works and is expected to have similar impact on fish that may be harvested.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could remove habitat of key valued species could reduce the abundance of these species for recreation harvesting.</li> <li>Moose is a key wildlife species that is recreationally hunted. The PDA for this segment contains minimal area of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>All route segments cross a similar number of watercourses involving in-water works and is expected to have similar impact on fish that may be harvested.</li> </ul>
				<b>No discernable difference between alternatives</b>	<b>No discernable difference between alternatives</b>
Extractive Industry	Removal of lands with potential for mineral extraction.	Area of land under mineral claim that the road segments pass through.	Engage with mineral claim holders in the road design stage to determine how impacts to mineral deposits can be minimized and / or access to mineral areas enhanced.	<ul style="list-style-type: none"> <li>The development of the road could remove mineral resource areas from being extracted in the future.</li> <li>This segment:               <ul style="list-style-type: none"> <li>has 608.39 ha of operational claims within the PDA; and</li> <li>would potentially result in greater loss of land under mineral claim.</li> </ul> </li> <li>See Engineering factor regarding availability of aggregate material for road construction.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could remove mineral resource areas from being extracted in the future.</li> <li>This segment:               <ul style="list-style-type: none"> <li>has 492.32 ha of operational claims within the PDA; and</li> <li>would potentially result in less loss of land under mineral claim.</li> </ul> </li> <li>See Engineering factor regarding availability of aggregate material for road construction.</li> </ul>
	Proximity to and access to lands with future potential for mining development.	Change to access to lands with future potential for mineral extraction.	Engage with mineral claim holders in the road design stage to determine how impacts to mineral deposits can be minimized and / or access to mineral areas enhanced.	<ul style="list-style-type: none"> <li>The development of the road could improve access to mineral resource areas and therefore potentially resulting in their development for economic benefit to the region and local communities. Mineral claim holders did not indicate route preferences when interviewed.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access to mineral resource areas and therefore potentially resulting in their development for economic benefit to the region and local communities. Mineral claim holders did not indicate route preferences when interviewed.</li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>
				<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
Forestry Industry	<ul style="list-style-type: none"> <li>Removal of commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>Area of commercial forestry land that the road segments pass through.</li> </ul>	<ul style="list-style-type: none"> <li>No measures because there are no impacts to commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the removal of forested lands that are commercially harvested.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the removal of forested lands that are commercially harvested.</li> </ul>
				<ul style="list-style-type: none"> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on removal of commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on removal of commercial forestry lands.</li> </ul>
	<b>No discernable difference</b>		<b>No discernable difference</b>		
	<ul style="list-style-type: none"> <li>Proximity to and access to lands with potential for forest harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Change to access to forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>Engage with forestry companies during road design stage regarding access to potential new forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could provide access to lands with timber that could be harvested for economic benefit to the region and local communities.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could provide access to lands with timber that could be harvested for economic benefit to the region and local communities.</li> </ul>
<ul style="list-style-type: none"> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on access to commercial forestry lands.</li> </ul>				<ul style="list-style-type: none"> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on access to commercial forestry lands.</li> </ul>	
<b>No discernable difference</b>		<b>No discernable difference</b>			
Remote Outfitters	<ul style="list-style-type: none"> <li>Change to operations of remote outfitters in vicinity of road routes.</li> </ul>	<ul style="list-style-type: none"> <li>Number and proximity of remote outfitters to the alternatives.</li> <li>Potential for impact to the outfitters from the alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>During final road alignment selection and road design phase consider proximity of remote tourism outfitters to maximize separation distance.</li> <li>Engage with tourism outfitters during road design phase.</li> <li>If applicable, provide compensation to any outfitters displaced or who can no longer operate because of the road.</li> <li>Develop a land / waterbody access plan to determine need for any access restrictions and / or access enhancements to protect remote tourism operations.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could mean that lands and waterbodies are more accessible to the public and decrease the attractiveness of the area for remote tourism operations.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could mean that lands and waterbodies are more accessible to the public and decrease the attractiveness of the area for remote tourism operations.</li> </ul>
				<ul style="list-style-type: none"> <li>This route has 2 remote tourism camp outfitter locations, both within 2.0 km of the PDA / roadway centreline. Increased levels of access to lands in the vicinity of camp locations could have a negative effect on tourism operations from potential decrease in species populations recreationally hunted and fished for.</li> </ul>	<ul style="list-style-type: none"> <li>This route has 1 remote tourism outfitter camp location, within 2.0 km of the PDA / roadway centreline. Increased levels of access to lands in the vicinity of camp locations could have a negative effect on tourism operations from potential decrease in species populations recreationally hunted and fished for.</li> </ul>
				<ul style="list-style-type: none"> <li>These camp locations could also experience noise effects from road construction and operations which could detract from the user experience and make these camps less attractive to the outfitter.</li> <li>Actual impact will depend on road alignment and public access / use of the roadway.</li> </ul>	<ul style="list-style-type: none"> <li>These camp locations could also experience noise effects from road construction and operations which could detract from the user experience and make these camps less attractive to the outfitter.</li> <li>Actual impact will depend on road alignment and public access / use of the roadway.</li> </ul>
				<b>No discernable difference</b>	
Trapping	<ul style="list-style-type: none"> <li>Change to trapping activity in vicinity of alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>Length of route passing through trap lines / number of trap lines affected.</li> <li>Potential for change in populations of harvested furbearing species.</li> </ul>	<ul style="list-style-type: none"> <li>Provide community updates regarding the location and timing of Construction noise activities.</li> <li>In selection of final road alignment and road design development, where possible, avoid high-quality furbearing species habitat.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the loss of furbearer habitat therefore decreasing the populations of these species for harvesting. Alternatively, the road could improve access to lands that trappers could take advantage of.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the loss of furbearer habitat therefore decreasing the populations of these species for harvesting. Alternatively, the road could improve access to lands that trappers could take advantage of.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
		<ul style="list-style-type: none"> <li>Change in access to lands for trapping.</li> </ul>	<ul style="list-style-type: none"> <li>Engage with trappers regarding need for access related mitigation and or enhancements to improve access for trappers.</li> </ul>	<ul style="list-style-type: none"> <li>This segment: <ul style="list-style-type: none"> <li>has a length of 27.48 km passing through trapline areas;</li> <li>intersects 2 trapline areas; and</li> <li>has 676.45 ha of trapline area within the PDA.</li> </ul> </li> <li>Would result in less impact on American marten and wolverine habitat.</li> <li>All route segments provide increased access to trapline areas.</li> <li>At the time of the evaluation it was unknown as to the extent to which the affected lands are used / valued for trapping by local Indigenous communities.</li> <li>Route passes through the lowest amount of trap line area and passes through the least amount of important furbearer habitat and is therefore ranked preferred.</li> </ul>	<ul style="list-style-type: none"> <li>This segment: <ul style="list-style-type: none"> <li>has a length of 23.23 km passing through trapline areas;</li> <li>intersects 2 trapline areas; and</li> <li>has 1,228.57 ha of trapline area within the PDA.</li> </ul> </li> <li>Would result in higher impact on American marten and wolverine habitat.</li> <li>All route segments provide increased access to trapline areas.</li> <li>At the time of the evaluation it was unknown as to the extent to which the affected lands are used / valued for trapping by local Indigenous communities.</li> <li>Route passes through the greatest amount of trap line area and passes through the highest amount of important furbearer habitat and is therefore ranked least preferred.</li> </ul>
				<b>Most Preferred</b>	<b>Least Preferred</b>

**Summary of Land and Resource Use:**

Overall

- Alternative 1 and Alternative 4 are equally preferred for Segment 2 – Albany from the perspective of Land and Resource Use, as the two routes can be considered relatively equal in overall impacts across VCs. Alternative 1 is preferred with respect to potential impacts on parks and trapping and Alternative 4 is preferred with respect to potential impacts on mineral claim areas. These preferences are considered to be modest.

Net Effects

- Both route alternatives were evaluated as having equivalent net effects regarding land use compatibility as there are no land use compatibility policies for the affected lands.
- Alternative 1 is preferred with regard to parks and protected areas as it has the lowest net effect to Albany River Provincial Park (least amount of park land removed).
- The two alternatives are considered to have similar recreation and tourism opportunities as both routes could provide increased access to areas that are currently inaccessible and remote (pending decisions regarding public access).
- The PDAs for both routes contain minimal area of high suitability moose habitat, a valued recreational hunting species.
- Alternative 1 passes through more lands under operational mineral claim. This could result in higher negative impacts to mineral resource areas (i.e. limit the ability to develop mineral lands within the roadway). Alternative 4 passes through fewer lands under operational mineral claim and therefore could result in lower negative impacts to mineral resource areas and considered to be preferred. The two routes are considered to be similar with respect to access to mineral areas for future development. Mineral claim holders did not express a route preference.
- The routes have similar potential for impact on remote tourism outfitters.
- This segment impacts no area of commercial forestry land. Both route segments have no impact on access to commercial forestry lands.
- The two alternatives are considered to have similar impact with regard to tourism outfitters as both routes have only one or two outfitter locations in proximity. Potential impacts to outfitters to be confirmed. Road alignment refinement and mitigation measures may reduce impacts.
- Alternative 1 passes through the lowest amount of trap line area and passes through the least amount of important furbearer habitat and therefore is considered to have the lowest net effect and is preferred for this factor / measure.

**Climate Adaptation and Resiliency**

**Summary of Climate Adaptation and Resiliency:**

Overall

- There is no discernible difference between the alternatives from a Climate Adaptation and Resiliency perspective.
- There exists significant data gaps and uncertainty in the generation of climate projections that have the appropriate level of granularity to differentiate between alternative routes.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Economic</b>					
Regional Economy	<ul style="list-style-type: none"> <li>Traditional Economies</li> </ul>	<ul style="list-style-type: none"> <li>Change in Ability to Undertake Traditional Economic Activities</li> </ul>	<ul style="list-style-type: none"> <li>Communicate information on planned and active construction activities to facilitate local planning of traditional economies such as trapping.</li> <li>In selection of final road alignment as part of road design development, where possible, avoid high-quality fur-bearer habitat.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road has the potential to result in net effects to traditional economies such as trapping.</li> <li>Trapping is the only identified traditional economic activity that may be occurring in the study area. Trapping activity has declined significantly throughout Canada due to low fur prices. Anecdotal input suggests that trapping activity in the LSA has also declined and is no longer an important economic activity.</li> <li>The development of the road may support trapping activity through providing better access to lands used for trapping or result in negative impacts by loss of habitat for targeted species. Despite trappers being requested for information, at this time, we have no input from the trappers on the level of activity in the intersected traplines or their opinions regarding potential impact from this route segment or road development in general.</li> <li>See Trapping indicator under Land and Resource Use for ranking of routes in regard to trapline area covered and furbearer habitat impacted.</li> <li>It is also possible that some fishing occurs in local rivers for commercial purposes, but we have no specific information to support this.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road has the potential to result in net effects to traditional economies such as trapping.</li> <li>Trapping is the only identified traditional economic activity that may be occurring in the study area. Trapping activity has declined significantly throughout Canada due to low fur prices. Anecdotal input suggests that trapping activity in the LSA has also declined and is no longer an important economic activity.</li> <li>The development of the road may support trapping activity through providing better access to lands used for trapping or result in negative impacts by loss of habitat for targeted species. Despite trappers being requested for information, at this time, we have no input from the trappers on the level of activity in the intersected traplines or their opinions regarding potential impact from this route segment or road development in general.</li> <li>See Trapping indicator under Land and Resource Use for ranking of routes in regard to trapline area covered and furbearer habitat impacted.</li> <li>It is also possible that some fishing occurs in local rivers for commercial purposes, but we have no specific information to support this.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>

**Summary of Economic:**

Overall

- Both alternatives are equally preferred for Segment 2 – Albany from the perspective of the economic VC.
- There is a negligible difference between the two route alternatives.
- All route segments will provide connection to the Marten Falls community and provided the same expected economic benefit to the community including, for example, a decrease in the price of goods.
- Similarly, all route segments are expected to provide similar employment opportunities and would have similar impact on government expenditure and taxation.
- There are no specific economic features (e.g., businesses, resource extraction operations) identified in the PDA of the alternative route segments.
- The opportunities for economic development including resource extraction activities such as mining are also identified to be similar amongst the alternative routes (see Land and Resource Use).
- As no information from trappers is available regarding the level of trapping activity along the route segments, the routes are identified to be similar with respect to impact on traditional economies.

Net Effects

- The predicted net effects from both alternatives are equivalent due to their similar predicted decrease in price of goods, employment opportunities, government expenditures, and opportunities for economic development.

Factor	Indicator	Measures	Alternative 1	Alternative 4
<b>Technical, Engineering and Costs</b>				
Design	Roadway alignment length.	Kilometres	27.48	23.23
	Number of water crossings.	Number	4	3
	Length of water crossings.	Metres	412	214
Construction Complexity	Access to roadway material.	Description	Most Preferred due to close proximity to aggregates within the right-of-way along the segment.	Least Preferred due to higher haul costs to obtain aggregates for road construction.
	Constructability of roadway.	High to Low	High - Most Preferred due to substrates consisting of glaciolacustrine deposits such as clays, stratified sands and gravel.	Low - Least Preferred due to substrates consisting of soft organic deposits such as peat, fen, and bogs.
	Constructability of water crossing.	High to Low	Low - Least Preferred due to longer crossing and multiple spans required.	High - Most Preferred due to shorter crossing and span lengths.
Miscellaneous	Schedule implications.	Description	Medium impact due to slightly longer road length to construct.	Lower impact due to shorter road length to construct.
Operations	Long-term maintenance.	Description	Most Preferred due to greater access to aggregates and shorter haul lengths.	Least Preferred due to blasting, hauling and crushing operations required.
Cost	Value of construction.	\$ CAD	<ul style="list-style-type: none"> <li>Bridges: \$ [REDACTED]</li> <li>Roads: \$ [REDACTED]</li> <li>Total: \$ [REDACTED]</li> </ul>	<ul style="list-style-type: none"> <li>Bridges: \$ [REDACTED]</li> <li>Roads: \$ [REDACTED]</li> <li>Total: \$ [REDACTED]</li> </ul>

**Summary of Technical, Engineering, and Cost:**

- Overall
- Alternative 4 is the most preferred route alternative for Segment 2 – Albany Crossing from the perspective of Technical, Engineering, and Cost.
  - Cost estimates are based on 2023 unit prices developed through discussions with northern Contractors and best practices.
  - Value of Construction includes a 20% contingency factor and climate change impacts that are assumed to be 35% to 40% of the structures' base prices.

## Acronyms

Acronym	Definition
ATV	All-Terrain Vehicle
CEMP	Construction Environmental Management Plan
DFO	Fisheries and Oceans Canada
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
FMP	Forest Management Plan
GHD	General Habitat Description
GHG	Greenhouse Gas
KDE	Kernel Density Estimation
LSA	Local Study Area
MFFN	Marten Falls First Nation
MNR	Ministry of Natural Resources
NHIC	Natural Heritage Information Centre
PDA	Project Development Area
POR	Points of reception
RSA	Regional Study Area
SAR	Species at Risk
SARA	Species at Risk Act
SCC	Species of Conservation Concern
VC	Valued Component

## References

- Environment and Climate Change Canada. 2019. Woodland Caribou, Boreal population (*Rangifer tarandus caribou*): amended recovery strategy [proposed].  
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- Fisheries and Oceans Canada (DFO). 2023. Measures to Protect Fish and Fish Habitat. July 2023. Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>
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<https://www.ontario.ca/page/general-habitat-description-forest-dwelling-woodland-caribou>
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- Wright D.G. and G.E. Hopky. 1998. Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. Canadian Technical Report of Fisheries and Aquatic Sciences 2107. Winnipeg, Manitoba. Available at: <https://publications.gc.ca/collections/Collection/Fs97-6-2107E.pdf>

## Segment 3 – North of Albany Crossing

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
Indigenous Current Use of Lands and Resources for Traditional Purposes	<ul style="list-style-type: none"> <li>Loss of or change to sites and areas used for traditional activities (hunting, trapping, fishing, berry picking, plant harvesting).</li> </ul>	<ul style="list-style-type: none"> <li>Overlap / intersection of Project footprint with harvesting sites and areas reported by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Continue to engage with Indigenous communities to identify harvesting sites and areas.</li> <li>Avoid, where possible, harvesting sites and areas identified by communities.</li> <li>Utilize signage (Indigenous and English language) during construction to identify harvesting sites and areas in the vicinity of the Project that must be avoided.</li> <li>Where avoidance is not possible, engage with potentially affected communities to discuss appropriate mitigation related to sites and areas used for harvesting.</li> <li>Inform Indigenous communities and trappers who may be trapping in the area of this segment of Project construction activities, schedules, and locations.</li> </ul>	<ul style="list-style-type: none"> <li>10 Marten Falls First Nation (MFFN) hunting and / or trapping locations intersected by the current alignment and associated aggregate areas.</li> <li>25 MFFN harvesting locations reported within the Study Area (2.5 km): <ul style="list-style-type: none"> <li>22 hunting and / or trapping locations; and</li> <li>3 fishing locations.</li> </ul> </li> <li>41 MFFN harvesting locations reported within the Local Study Area (LSA) (5 km): <ul style="list-style-type: none"> <li>36 hunting and / or trapping locations; and</li> <li>5 fishing locations.</li> </ul> </li> <li>From the perspective of interactions with reported MFFN harvesting sites and areas, Alternative 1 would appear to be the preferred route. However, Alternative 1 is identified as the least preferred route from the perspective of animal harvesting in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project. It is important to note that the 2023 Study only looked at new harvesting data collected, which was limited in the area of Segment 3 (three reported locations); the Study did not include any information on preferences based on all MFFN harvesting data available, including previously collected data through the community-based land use planning process that was shared with the Project Consultant Team. Moreover, the preference in the 2023 Study is based on concerns related to the potential for pollution from the road and associated impacts on resources used for harvesting, rather than concerns related to direct impacts to harvesting sites.</li> <li>The alternative is located in an area that may be used by Aroland First Nation for traditional purposes, including animal, fish, and plant harvesting.</li> <li>Lowest net effects anticipated given the lower number of interactions with MFFN harvest locations.</li> </ul>	<ul style="list-style-type: none"> <li>14 MFFN harvesting locations intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>13 hunting and / or trapping locations; and</li> <li>1 fishing location.</li> </ul> </li> <li>23 MFFN harvesting locations reported within the Study Area (2.5 km): <ul style="list-style-type: none"> <li>20 hunting and / or trapping locations; and</li> <li>3 fishing locations.</li> </ul> </li> <li>33 MFFN harvesting locations reported within the LSA (5 km): <ul style="list-style-type: none"> <li>28 hunting and / or trapping locations; and</li> <li>5 fishing locations.</li> </ul> </li> <li>From the perspective of interactions with reported MFFN harvesting sites and areas, Alternative 4 would not appear to be the preferred route. However, Alternative 4 is identified as the most preferred route from the perspective of animal harvesting in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project. It is important to note that the 2023 Study only looked at new harvesting data collected, which was limited in the area of Segment 3 (three reported locations); the Study did not include any information on preferences based on all MFFN harvesting data available, including previously collected data through the community-based land use planning process that was shared with the Project Consultant Team. Moreover, the preference in the 2023 Study is based on concerns related to the potential for pollution from the road and associated impacts on resources used for harvesting, rather than concerns related to direct impacts to harvesting sites.</li> <li>The alternative is located in an area that may be used by Aroland First Nation for traditional purposes, including animal, fish, and plant harvesting.</li> <li>Highest net effects anticipated given the greatest number of interactions with MFFN harvest locations.</li> </ul>
				<b>Indicator Summary</b>	<b>Most Preferred</b>
				Alternative 1 is the most preferred route because it has the fewest intersections with reported MFFN harvesting sites, and as a result is anticipated to have lower net effect on sites and areas used for traditional activities.	Alternative 4 is the least preferred route because it has the least intersections with reported MFFN harvesting sites, and as a result is anticipated to have higher net effect on sites and areas used for traditional activities.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
	<ul style="list-style-type: none"> <li>Changes in the availability of lands and resources (e.g., wildlife, fish, vegetation) for traditional harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in land availability resulting from overall road / clearing area of each route assessment.</li> <li>Changes to ungulate habitat availability and distribution.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Implement appropriate mitigation measures for wildlife, fish, and vegetation resources that are used for traditional purposes – refer to respective Valued Components (VCs) for mitigation measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>Develop an Environmental Protection Plan with potentially affected Indigenous communities that include best management practices for wildlife, fish, and vegetation protection and mitigation based on Indigenous Knowledge.</li> <li>Develop and implement an Indigenous-led environmental monitoring program that utilizes Indigenous Knowledge to continue to assess changes in availability or quantity of resources so that mitigation measure can be employed more effectively and in “real time” during the construction and operation of the road.</li> <li>Involve local Indigenous communities in the development of access management measures or plans, including the development of policies for non-Indigenous Project personnel while on shift or at temporary construction camps with respect to any harvesting activities.</li> <li>Work with other governing bodies to develop regulations that minimize non-local access to and harvesting pressure on local wildlife, fish, and vegetation.</li> <li>Use Indigenous land users (e.g., hunters and trappers) to monitor the Project area to support the enforcement of access management measures.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is the least preferred as it results in the greatest amount of land clearing (2,426.60 ha).</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 85 ha of high suitability moose habitat within the Project Development Area (PDA), and 911 ha of highly suitable moose habitat is located within 500 m of the current alignment and may be indirectly disturbed by noise and dust.</li> <li>This alternative is anticipated to disturb known and potential Category 1 General Caribou Habitat, including 820 ha of winter use areas and 95 ha of travel corridors in the PDA, and may indirectly disturb 5,315 ha of known and potential winter use area habitat, 6 ha of known and potential nursery area habitat, and 1,203 ha of known and potential travel corridor habitat within 500 m of the current alignment from noise and dust.</li> <li>Highest net effects anticipated given the greatest amount of known and potential moose and caribou habitat that could be directly and indirectly affected when compared to Alternative 4.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>Alternative 1 is the least preferred, as it is anticipated to result in the greatest direct loss of moderate / high-quality American marten habitat (1,926.47 ha), and it has the highest wolverine relative abundance (1.33) and the largest number of observations of female wolverine and wolverines of unknown sex.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb confirmed or suitable waterfowl habitat features.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>This alternative has the greatest number of waterbody crossing locations (3) where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is the most preferred as it results in the least amount of land clearing (824.99 ha).</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 5 ha of high suitability moose habitat within the PDA, and 45 ha of highly suitable moose habitat is located within 500 m of the current alignment and may be indirectly disturbed by noise and dust.</li> <li>This alternative is anticipated to disturb known and potential Category 1 General Caribou Habitat, including 228 ha of winter use areas, and may indirectly disturb 1,932 ha of known and potential winter use area habitat within 500 m of the current alignment from noise and dust.</li> <li>Lowest net effects anticipated given the lower amount of known and potential moose and caribou habitat that could be directly and indirectly affected when compared to Alternative 1.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>Alternative 4 is the most preferred, as it is anticipated to result in the least direct loss of moderate / high-quality American marten habitat (620.80 ha), and it has the lowest wolverine relative abundance (0.83) and the fewest number of observations of female wolverine and wolverines of unknown sex.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb confirmed or suitable waterfowl habitat features.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>This alternative has the least number of waterbody crossing locations (2) where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>The net effect for each of the alternatives were predicted to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<ul style="list-style-type: none"> <li>Changes to the presence and accessibility to Traditional Use Plants.</li> <li>Change to access to land utilized for recreation and / or tourism (increased access and pressure on resources).</li> <li>Indigenous Knowledge on important habitat for fish and wildlife that may need to be avoided.</li> </ul>		<p>without loss of function or individuals are predicted.</p> <p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>This alternative is the least preferred as it results in the greatest direct loss of highly suitable and highly accessible habitats for Traditional Use Plants (735.81 ha).</li> </ul> <p><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>While both alternatives provide greater access to lands that are currently inaccessible by road and could be used for recreation purposes, from MFFN's perspective the lands and watercourses in the area of Alternative 1 provide good habitat, and MFFN harvesting opportunities, for moose.</li> <li>As indicated in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, MFFN community members have expressed concerns about the increased access that this alternative would provide to non-Indigenous and non-local people, resulting in increased pressure on moose in the area.</li> </ul> <p><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>This alternative is the least preferred by MFFN as it is located in an area that is known to be used by caribou for breeding and is therefore sensitive during the spring and summer months, and it intersects with a caribou migration route, with potential for impacts on the caribou population, as noted in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project.</li> </ul> <p><b>Least Preferred</b></p>	<p>without loss of function or individuals are predicted.</p> <p><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>This alternative is most preferred as it results in the least direct loss of highly suitable and highly accessible habitats for Traditional Use Plants (269.91 ha).</li> </ul> <p><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>While both alternatives provide greater access to lands that are currently inaccessible by road and could be used for recreation purposes, Alternative 4 is the most preferred route as it is the furthest away from lands and waters used by moose, which are harvested by MFFN for traditional purposes, compared to Alternative 1, as indicated in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project. Therefore, Alternative 4 is anticipated to have the lowest net effects on the availability of moose harvested for traditional purposes in these areas.</li> </ul> <p><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>This alternative is the most preferred by MFFN as it avoids known sensitive caribou habitat when compared to Alternative 1, as noted in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project.</li> </ul> <p><b>Most Preferred</b></p>
		<b>Indicator Summary</b>		Alternative 1 is the least preferred route because it would result in the greatest amount of land clearing and it is anticipated to have the greatest net effects on the resources used for traditional purposes. As a result, this alternative is anticipated to have the highest net effect on the availability of lands and resources for traditional harvesting.	Alternative 4 is the most preferred route because it would result in the least amount of land clearing and it is anticipated to have the lowest net effects on the resources used for traditional purposes. As a result, this alternative is anticipated to have the lowest net effect on the availability of lands and resources for traditional harvesting.
	<ul style="list-style-type: none"> <li>Changes in quality of resources for traditional purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for changes in the quality of country food.</li> <li>Potential for changes in the perception of quality of country foods.</li> </ul>	<ul style="list-style-type: none"> <li>Community input into alignment routing, component siting and road design avoid important areas of botanical and wildlife resources that serve as country foods, to the extent feasible.</li> <li>Mitigation measures during construction to prevent spills and malfunctions, and to reduce any impacts associated with these should they happen.</li> <li>Develop a response plan in case of spills or other environmental emergencies along the road.</li> </ul>	<ul style="list-style-type: none"> <li>Information on how the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul> <p><b>No discernible difference</b></p> <ul style="list-style-type: none"> <li>Information on how the perception of the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul> <p><b>No discernible difference</b></p>	<ul style="list-style-type: none"> <li>Information on how the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul> <p><b>No discernible difference</b></p> <ul style="list-style-type: none"> <li>Information on how the perception of the quality of harvested species could be affected by the road is not available at this time and will be assessed as part of the project impact assessment.</li> </ul> <p><b>No discernible difference</b></p>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
			<ul style="list-style-type: none"> <li>Develop and implement an Indigenous-led environmental monitoring program that utilizes Indigenous Knowledge to continue to assess potential changes in the quality of resources.</li> </ul>		
		<b>Indicator Summary</b>		There is no preference between the alternatives as there is currently no information available for this indicator. This will be assessed as part of the overall Project impact assessment, and will be informed by inputs from Indigenous communities, where provided.	
	<ul style="list-style-type: none"> <li>Changes in access to sites and areas used for traditional activities.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for any temporary or permanent Project components to impede access to sites and areas used for harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> <li>Involve local Indigenous communities in the development of access management measures or plans.</li> <li>Create temporary detours for snowmobiles and ATVs during construction. Use signage in English and Indigenous languages for any temporary detour routes.</li> <li>Provide community updates regarding location and timing of construction activities.</li> <li>Provide access ramps to traditional travel routes bisected by the road, where required.</li> <li>Continued engagement with Indigenous communities to identify any access concerns during construction and operation.</li> </ul>	<ul style="list-style-type: none"> <li>Current alignment intersects with 4 reported MFFN travel routes and areas (including winter travel routes, a trail, and an area reported to contain canoe routes) and 2 historical trails reported by Neskantaga First Nation (documented in geological survey reports from 1886 and 1904).</li> <li>7 Indigenous travel routes reported within the Study Area (2.5 km).</li> <li>12 Indigenous travel routes reported within the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>Current alignment intersects with 2 reported MFFN travel routes and 2 historical trails reported by Neskantaga First Nation (documented in geological survey reports from 1886 and 1904).</li> <li>6 Indigenous travel routes reported within the Study Area (2.5 km).</li> <li>9 Indigenous travel routes reported within the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>
		<ul style="list-style-type: none"> <li>Changes in waterway navigability.</li> </ul>		<p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Route alternative to cross 18 waterbodies.</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> <li>This alternative is least preferred given it will cross twice as many waterbodies compared to Alternative 4, with greater potential for net effects anticipated as a result.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p>	<p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Route alternative to cross 9 waterbodies.</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> <li>This alternative is most preferred given it will cross half the number of waterbodies compared to Alternative 1, with lower potential for net effects anticipated as a result.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p>
		<b>Indicator Summary</b>		Alternative 1 is the least preferred route because it crosses twice as many waterbodies compared to Alternative 4. As a result, this alternative is anticipated to have greater potential for net effects on waterway navigability. There are no discernable differences with respect to the potential to impede access to sites and areas used for harvesting.	Alternative 4 is the most preferred route because it crosses half the number of waterbodies compared to Alternative 1. As a result, this alternative is anticipated to have lower potential net effects on waterway navigability. There are no discernable differences with respect to the potential to impede access to sites and areas used for harvesting.
Cultural Continuity and Well-being (ability to practice and transmit cultural traditions)	<ul style="list-style-type: none"> <li>Loss of or change to culturally important sites and areas and their access.</li> </ul>	<ul style="list-style-type: none"> <li>Comparison / intersection of Project footprint with cultural, spiritual, and / or historical sites and areas reported by Indigenous communities (habitation,</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Continue to engage with Indigenous communities to identify culturally important sites and areas and associated access.</li> <li>Complete any necessary or appropriate archaeological and cultural heritage assessments.</li> </ul>	<ul style="list-style-type: none"> <li>5 reported MFFN cultural, spiritual, and / or historical sites or areas are intersected by the current alignment and associated aggregate areas: <ul style="list-style-type: none"> <li>2 traditional gathering areas; and</li> <li>3 place name features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>3 reported MFFN place name features are intersected by the current alignment and associated aggregate areas.</li> <li>7 MFFN cultural, spiritual, and / or historical locations reported within the Study Area (2.5 km).</li> <li>24 MFFN cultural, spiritual, and / or historical locations reported within the LSA (5 km).</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<ul style="list-style-type: none"> <li>burial, ceremonial, sacred, meeting, teaching).</li> </ul>	<ul style="list-style-type: none"> <li>Avoid, where possible, culturally important sites and areas identified by communities.</li> <li>Utilize signage (Indigenous and English language) during construction to identify sites and areas in the vicinity of the Project that must be avoided.</li> <li>Where avoidance is not possible, engage with potentially affected communities to discuss appropriate mitigation related to culturally important sites and areas (e.g., Cultural Heritage Impact Assessment, community-specific chance finds protocols, etc.).</li> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> <li>Involve local Indigenous communities in the development of access management measures or plans.</li> </ul>	<ul style="list-style-type: none"> <li>15 MFFN cultural, spiritual, and / or historical locations reported within the Study Area (2.5 km), including a burial site reported within 300 m of the current alignment and associated aggregate areas.</li> <li>18 MFFN cultural, spiritual, and / or historical locations reported within the LSA (5 km).</li> <li>Greater net effects (and potential net effects) anticipated given the higher number of intersections with reported MFFN cultural, spiritual, and / or historical sites or areas, specifically with two traditional gathering areas, and the presence of a reported MFFN burial site within 300 m of the current alignment and associated aggregate areas.</li> </ul>	<ul style="list-style-type: none"> <li>Lower net effects (and potential net effects) anticipated given the lower number of intersections with reported MFFN cultural, spiritual, and / or historical sites or areas, and the nature of these features (i.e., place name features only, no traditional gathering areas). In addition, the closest reported burial site is more than 500 m away from the current alignment and associated aggregate areas.</li> </ul>
		<ul style="list-style-type: none"> <li>Changes in previously identified archaeological sites.</li> </ul>	<ul style="list-style-type: none"> <li>Create temporary detours for snowmobiles and ATVs during construction. Use signage in English and Indigenous languages for any temporary detour routes.</li> </ul>	<p style="text-align: center;"><b>Least Preferred</b></p> <ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>	<p style="text-align: center;"><b>Most Preferred</b></p> <ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>
		<ul style="list-style-type: none"> <li>Potential for any temporary or permanent Project components to impede access to culturally important sites and areas.</li> </ul>	<ul style="list-style-type: none"> <li>Provide community updates regarding location and timing of construction activities.</li> <li>Provide access ramps to travel routes bisected by the road, where required.</li> <li>Continued engagement with Indigenous communities to identify any access concerns during construction and operation.</li> </ul>	<p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Current alignment intersects with 4 reported MFFN travel routes and areas (including winter travel routes, a trail, and an area reported to contain canoe routes) and 2 historical trails reported by Neskantaga First Nation (documented in geological survey reports from 1886 and 1904).</li> <li>7 Indigenous travel routes reported within the Study Area (2.5 km).</li> <li>12 Indigenous travel routes reported within the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>	<p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Current alignment intersects with 2 reported MFFN travel routes and 2 historical trails reported by Neskantaga First Nation (documented in geological survey reports from 1886 and 1904).</li> <li>6 Indigenous travel routes reported within the Study Area (2.5 km).</li> <li>9 Indigenous travel routes reported within the LSA (5 km).</li> <li>Access along travel routes will be allowed / maintained during construction and should there be any temporary periods of time that access across the construction area will not be permitted for safety reasons, the users / communities will be advised of this in advance.</li> <li>Minimal net effects anticipated with the application of mitigation measures.</li> </ul>
		<ul style="list-style-type: none"> <li>Change in waterway navigability.</li> </ul>		<p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Route alternative to cross 18 waterbodies.</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> <li>This alternative is least preferred given it will cross twice as many waterbodies compared to Alternative 4, with greater net effects anticipated as a result.</li> </ul>	<p style="text-align: center;"><b>No discernable difference</b></p> <ul style="list-style-type: none"> <li>Route alternative to cross 9 waterbodies.</li> <li>The development of bridges over watercourses could negatively affect navigation during construction. All structures over navigable waters will maintain navigation so no permanent effects anticipated.</li> <li>This alternative is most preferred given it will cross half the number of waterbodies compared to Alternative 1, with lower net effects anticipated as a result.</li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<b>Indicator Summary</b>		Alternative 1 is the least preferred route because it has the most intersections with reported MFFN cultural, spiritual, and / or historical sites or areas (which include traditional gathering areas) and given the presence of a reported MFFN burial site within 300 m of the current alignment and associated aggregate areas. Therefore, it is anticipated to result in greater net effects on culturally important sites and areas.	Alternative 4 is the most preferred route because it has the fewest intersections with reported MFFN cultural, spiritual, and / or historical sites or areas, and given the nature of the features intersected (i.e., place name features only). Therefore, it is anticipated to result in lower net effects on culturally important sites and areas.
	<ul style="list-style-type: none"> <li>Changes in the sufficiency of lands and resources for cultural practices.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for exceedances in any thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures identified to avoid or minimize changes in quantity and quality of lands and resources for traditional purposes will also serve as mitigation measures for this indicator.</li> <li>Where thresholds are identified, engage with Indigenous communities to discuss appropriate mitigation measures to be included in the Environmental Protection Plan.</li> </ul>	<ul style="list-style-type: none"> <li>There is currently no information on thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> <li>This will be assessed as part of the overall Project impact assessment, where information is provided by Indigenous communities.</li> </ul>	<ul style="list-style-type: none"> <li>There is currently no information on thresholds identified by Indigenous communities that would impair the ability of community members to exercise their harvesting rights.</li> <li>This will be assessed as part of the overall Project impact assessment, where information is provided by Indigenous communities.</li> </ul>
		<b>Indicator Summary</b>		<b>No discernable difference</b>	<b>No discernable difference</b>
		<b>Indicator Summary</b>		There is no preference between the alternatives as there is currently no information available for this indicator. This will be assessed as part of the overall Project impact assessment, should this information be provided by Indigenous communities.	
	<ul style="list-style-type: none"> <li>Changes in the experience of being on the land.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in noise.</li> </ul>	<ul style="list-style-type: none"> <li>Work with Indigenous communities to identify appropriate buffers for harvesting and cultural use sites and areas during alignment routing, component siting, and road design.</li> <li>Implement appropriate mitigation measures for noise, visual, and air quality – refer to respective VCs for mitigation measures.</li> <li>Engage with Indigenous communities on construction schedule to identify key harvesting and cultural use times and sites and areas that should be avoided.</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the tranquility that is experienced when out on the land is important for maintaining connections to the land.</li> <li>10 reported MFFN harvesting areas and 5 reported MFFN cultural, spiritual, and / or historical sites are intersected by the current alignment and associated aggregate areas.</li> <li>4 reported MFFN travel routes and areas and 2 historical trails reported by Neskantaga First Nation are intersected by the current alignment.</li> <li>There are 3 MFFN land use locations that have been reported within 500 m of the current alignment, including: <ul style="list-style-type: none"> <li>2 harvesting sites; and</li> <li>1 burial site.</li> </ul> </li> <li>The alternative is located in an area that may be used by Aroland First Nation for traditional purposes, including animal, fish, and plant harvesting.</li> <li>Not enough information is currently available to understand the potential net effects on the experience of being on the land from a noise perspective for this route alternative, and to compare the potential net effects between the two alternatives. No discernable difference between the route alternatives identified.</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the tranquility that is experienced when out on the land is important for maintaining connections to the land.</li> <li>14 reported MFFN harvesting areas and 3 reported MFFN cultural, spiritual, and / or historical sites are intersected by the current alignment and associated aggregate areas.</li> <li>2 reported MFFN travel routes and areas and 2 historical trails reported by Neskantaga First Nation are intersected by the current alignment.</li> <li>There are 6 MFFN land use locations that have been reported within 500 m of the current alignment, including: <ul style="list-style-type: none"> <li>5 harvesting sites; and</li> <li>1 winter trail.</li> </ul> </li> <li>The alternative is located in an area that may be used by Aroland First Nation for traditional purposes, including animal, fish, and plant harvesting.</li> <li>Not enough information is currently available to understand the potential net effects on the experience of being on the land from a noise perspective for this route alternative, and to compare the potential net effects between the two alternatives. No discernable difference between the route alternatives identified.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<ul style="list-style-type: none"> <li>Changes in the visual environment.</li> </ul>		<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the natural landscape is important for maintaining connections to the land.</li> <li>The development of watercourse crossings (bridges) can impact the natural landscape (visual environment), and therefore the experience of being on the land.</li> <li>Changes to vegetation and ecosystems can change the landscape character, and therefore the experience of being on the land.</li> <li>This alternative has a greater number of water crossings (18) and will result in greater disturbance to wetland and riparian ecosystems (1,178.96 ha) and peatland (1,046 ha) compared to Alternative 4, and therefore is anticipated to have greater visual impact. Both alternatives intersect with a similar number of total reported MFFN traditional land use features.</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, maintaining the natural landscape is important for maintaining connections to the land.</li> <li>The development of watercourse crossings (bridges) can impact the natural landscape (visual environment), and therefore the experience of being on the land.</li> <li>Changes to vegetation and ecosystems can change the landscape character, and therefore the experience of being on the land.</li> <li>This alternative has fewer number of water crossings (9) and will result in less disturbance to wetland and riparian ecosystems (430.45 ha) and peatland (433.27 ha) compared to Alternative 1, and therefore is anticipated to have lower visual impact. Both alternatives intersect with a similar number of total reported MFFN traditional land use features.</li> </ul>
		<b>Indicator Summary</b>		<b>Least Preferred</b>	<b>Most Preferred</b>
				Alternative 1 is the least preferred route because it is anticipated to have the potential for greater net effects from a visual perspective given the number of water crossings required and the changes to landscape character. As a result, this alternative is anticipated to have the greatest potential for net effect on the experience of being on the land.	Alternative 4 is the most preferred route because it is anticipated to have the potential for lower net effects from a visual perspective given the requirement for fewer water crossings and the expected changes to landscape character compared to Alternative 1. As a result, this alternative is anticipated to have a lower potential for net effect on the experience of being on the land.
	<ul style="list-style-type: none"> <li>Changes to ability to practice and transmit cultural traditions.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for changes in the ability to use preferred harvesting areas, camps, cabins, and ancestral locations (historical family or village sites, and traditional gathering areas and meeting places).</li> </ul>	<ul style="list-style-type: none"> <li>Avoid, where possible, preferred harvesting and cultural use sites and areas identified by communities.</li> <li>Work with Indigenous communities to identify mitigation measures for potential impacts on the ability to practice and transmit cultural traditions (e.g., schedule construction with consideration for preferred harvesting times where possible, support with developing on the land programming for members, including youth).</li> <li>Develop all temporary and permanent road signs to include local Indigenous language(s) on them.</li> <li>Work with local Indigenous communities to develop interpretative signage along the route. This could include information about the local Indigenous communities and their histories in the region and on the land, their culture, and / or the cultural landscape.</li> </ul>	<ul style="list-style-type: none"> <li>There is no information available on preferred MFFN harvesting areas in the area of this segment.</li> <li>The alternative does not intersect with any reported MFFN camps, seasonal campgrounds, cabins, or historical family or village sites; however, it does intersect with 2 reported MFFN traditional gathering areas.</li> <li>There are 2 reported MFFN habitation sites within the Study Area (2.5 km).</li> <li>The alternative is anticipated to have greater net effects given the intersections with reported MFFN traditional gathering areas.</li> </ul>	<ul style="list-style-type: none"> <li>There is no information available on preferred MFFN harvesting areas in the area of this segment.</li> <li>The alternative does not intersect with any reported MFFN camps, seasonal campgrounds, cabins, historical family or village sites, or traditional gathering areas and meeting places.</li> <li>There are 2 reported MFFN habitation sites within the Study Area (2.5 km).</li> <li>The alternative is anticipated to have lower net effects given that there are no intersections with any reported MFFN habitation sites and ancestral locations.</li> </ul>
		<ul style="list-style-type: none"> <li>Potential for changes in ability to practice cultural traditions in the preferred way (preferred methods in the preferred time of year).</li> </ul>		<b>Least Preferred</b>	<b>Most Preferred</b>
				Information on how the ability to practice cultural traditions in the preferred way could be affected by the road and associated alternatives is not available at this time and will be assessed as part of the overall Project impact assessment.	Information on how the ability to practice cultural traditions in the preferred way could be affected by the road and associated alternatives is not available at this time and will be assessed as part of the overall Project impact assessment.
				<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
		<ul style="list-style-type: none"> <li>Potential for changes in ability to access and use important teaching sites and areas, including place names and sites and areas of importance based on oral history / stories / legends.</li> </ul>		<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, place name sites contribute to the strengthening of the Ojibwe language and represent the passing down of knowledge, connection to the land, culture, and history.</li> <li>Similarly, teaching, legend, and / or storied sites support the passing of knowledge, connection to the land, culture, and history.</li> <li>This alternative intersects with 3 reported MFFN place name features – Nihgiko Ziibih, Wabihzii Wih Ziibih, and Onagwabiikan'iih Ziibih.</li> <li>8 MFFN place name sites are reported within the Study Area (within 2.5 km) and LSA (within 5 km).</li> <li>No discernable differences identified in terms of potential net effects.</li> </ul>	<ul style="list-style-type: none"> <li>Based on information provided in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project, place name sites contribute to the strengthening of the Ojibwe language and represent the passing down of knowledge, connection to the land, culture, and history.</li> <li>Similarly, teaching, legend, and / or storied sites support the passing of knowledge, connection to the land, culture, and history.</li> <li>This alternative intersects with 3 reported MFFN place name features – Kicti Otakih, Wabihzii Wih Ziibih, and Onagwabiikan'iih Ziibih.</li> <li>4 MFFN place name sites are reported within the Study Area (within 2.5 km) and 7 MFFN place name sites are reported in the LSA (within 5 km).</li> <li>No discernable differences identified in terms of potential net effects.</li> </ul>
			<b>Indicator Summary</b>	<b>No discernable difference</b>	<b>No discernable difference</b>
				Alternative 1 is the least preferred route because of its intersections with reported MFFN traditional gathering areas. Therefore it is anticipated to have the greatest net effect on the ability to practice and transmit cultural traditions. There are no discernable differences between the alternatives in terms of the potential for changes in ability to use habitation, ancestral, and / or preferred harvesting sites, and in ability to practice cultural traditions in the preferred way.	Alternative 4 is the most preferred route because there are no intersections with any reported MFFN habitation sites and ancestral locations. Therefore it is anticipated to have the lowest net effect on the ability to practice and transmit cultural traditions. There are no discernable differences between the alternatives in terms of the potential for changes in ability to use habitation, ancestral, and / or preferred harvesting sites, and in ability to practice cultural traditions in the preferred way.

**Summary of Aboriginal and Treaty Rights and Interests:**

Overall

- Alternative 4 is the most preferred route alternative for Segment 3 – North of Albany from the perspective of Aboriginal and Treaty Rights and Interests, as it has the lowest potential for impacts on the availability of lands and resources for traditional harvesting, culturally important sites and areas, experiences of being on the land, and the ability to practice and transmit cultural traditions.
- Alternatives 1 is the least preferred routes for Segment 3 – North of Albany from the perspective of Aboriginal and Treaty Rights and Interests.

Impacts / Net Effects

- Anticipated and potential impacts / net effects were considered higher for Alternative 1 and lower for Alternative 4.
- Alternative 1 has the fewest intersections with reported MFFN harvesting sites, and as a result is anticipated to have lower net effect on sites and areas used for traditional activities compared to Alternative 4.
- Alternative 4 will require the least amount of land clearing and is anticipated to have the lowest net effects on the resources used for traditional purposes, and therefore is anticipated to have the lowest net effect on the availability of lands and resources for traditional harvesting. Indirect effects of increased access to non-Indigenous land users and harvesters may not be fully mitigated, regardless of the alternative selected.
- There is no information currently available to determine the net effects of the alternatives on the quality, or perceived quality, of resources used for traditional purposes – this will be assessed in the future as part of the project impact assessment.
- Alternative 4 crosses half the number of waterbodies compared to Alternative 1, therefore it is anticipated to have lower net effects on waterway navigability. There are no discernable differences with respect to the potential to impede access to sites and areas used for harvesting.
- Alternative 4 fewest intersections with reported MFFN cultural, spiritual, and / or historical sites or areas and is anticipated to result in lower net effects on culturally important sites and areas as a result.
- There is no information currently available to determine the potential impact on the sufficiency of lands and resources for cultural practices – this will be assessed in the future as part of the project impact assessment, should this information be provided by Indigenous communities.
- Alternative 4 is anticipated to have a lower potential for net effects from a visual perspective given the requirement for fewer water crossings and the expected changes to landscape character compared to Alternative 1, therefore it is anticipated to have a lower potential for net effect on the experience of being on the land. There is no discernable difference between the alternatives from the perspective of changes in the noise environment.
- Alternative 4 is anticipated to have the lowest net effect on the ability to practice and transmit cultural traditions as there are no intersections with any reported MFFN habitation sites and ancestral locations. There are no discernable differences between the alternatives in terms of the potential for changes in ability to use habitation, ancestral, and / or preferred harvesting sites, and in ability to practice cultural traditions in the preferred way.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Aboriginal and Treaty Rights and Interests</b>					
<ul style="list-style-type: none"> <li>The comprehensive assessment of net effects to Aboriginal and Treaty Rights and Interests will be completed on the preferred route selected and may result in a different determination of predicted net effects to the VC, depending on additional information provided by Indigenous communities in terms of land and resource use for traditional purposes and cultural traditions.</li> </ul>					
<u>Limitations</u>					
<ul style="list-style-type: none"> <li>Information on Indigenous land and resource use for traditional purposes in the area of Segment 3 – North of Albany is largely limited to the MFFN community. There is currently very limited available information on land and resource use for traditional purposes by other Indigenous communities, including Aroland First Nation and Neskantaga First Nation, in the area of Segment 3.</li> <li>The route preferences indicated in the 2023 MFFN Indigenous Knowledge, Land Use and Occupancy Study completed for the Project are based on new information collected as part of the study only; the stated preferences did not factor in MFFN Indigenous Knowledge, land use and occupancy information previously collected as part of the community-based land use planning process and shared with the Project Consultant Team in 2019.</li> <li>Information on whether locations and areas are presently used by MFFN for traditional purposes (or were only used in the past) is not available for most of the data provided by MFFN.</li> <li>It is unknown if, but unlikely that, all traditional land and resource use sites and areas reported have been ground-truthed to confirm location accuracy.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Water</b>					
<b>Fish, Fish Habitat</b>					
Fish and Fish Habitat VC: <ul style="list-style-type: none"> <li>• Lake Sturgeon</li> <li>• Walleye</li> <li>• Brook Trout</li> <li>• Northern Pike</li> <li>• Lake Whitefish</li> <li>• Burbot</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat Quantity and Quality.</li> <li>• Distribution and connectivity to habitat and migration.</li> <li>• Survival and reproduction.</li> </ul>	<ul style="list-style-type: none"> <li>• Total number of waterbody crossings.</li> <li>• Number of crossings requiring in-water work (e.g., culverts, bridge piers or abutments below the high-water mark).</li> <li>• Number of crossings requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul>	<ul style="list-style-type: none"> <li>• Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include:               <ul style="list-style-type: none"> <li>○ Development and implementation of a Construction Environmental Management Plan (CEMP) by the Contractor.</li> <li>○ Adherence to in-water work timing windows.</li> <li>○ Adherence to blasting measures in accordance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998).</li> <li>○ Adherence to Fisheries and Oceans Canada's (DFO) <i>Measures to Protect Fish and Fish Habitat</i> (DFO, 2023).</li> <li>○ Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>○ Measures to avoid unnecessary idling to minimize emissions and greenhouse gases (GHGs).</li> <li>○ Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>○ Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> </ul> </li> <li>• Measures to limit the spread and / or introduction of invasive species.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is anticipated to:               <ul style="list-style-type: none"> <li>○ cross 18 waterbodies;</li> <li>○ cross 14 waterbodies requiring in-water work; and</li> <li>○ cross 3 waterbodies requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is anticipated to:               <ul style="list-style-type: none"> <li>○ cross 9 waterbodies;</li> <li>○ cross 5 waterbodies requiring in-water work; and</li> <li>○ cross 2 waterbodies requiring in-water work below the high-water mark with potential for sensitive fish communities (i.e., coldwater species or Lake Sturgeon).</li> </ul> </li> </ul>
<b>Summary of Fish, Fish Habitat:</b>					
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li>• <b>Alternative 4 is the most preferred route alternative for Segment 3 – North of Albany from the perspective of Fish and Fish Habitat.</b></li> <li>• The route has the least number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>• Alternative 1 is the least preferred (moderately) alternative of Segment 3 – North of Albany from the perspective of fish and fish habitat, because it has the greatest number of waterbody crossing locations where instream work would be required in areas with potential habitat for sensitive fish communities / coldwater VC fish species (Brook Trout, Lake Whitefish, Burbot) or Lake Sturgeon.</li> <li>• There is a negligible difference between the alternatives.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>• The predicted net effect for each of the alternatives were evaluated to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures, minor change to baseline habitat and conditions, without loss of function or individuals are predicted. The comprehensive review of fish and fish habitat and assessment of net effects will be completed on the preferred route selected and may result in different determination of predicted net effects.</li> </ul> <p><b>Notes:</b></p> <p>The requirement for in-water works were determined as follows:</p> <ul style="list-style-type: none"> <li>• For waterbody crossings with bankfull widths less than 5 m, it is assumed that culverts would be used (requiring in-water work).</li> <li>• For waterbody crossings with bankfull widths greater than or equal to 5 m and less than 25 m, it is assumed that clear span bridges would be used (no in-water work).</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Water</b>					
<ul style="list-style-type: none"> <li>For waterbody crossings greater than or equal to 25 m, it is assumed that bridges with piers and abutments would be used (requiring in-water work).</li> <li>For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it is assumed that in-water work would be required.</li> </ul>					
<b>Groundwater and Geochemistry</b>					
Groundwater	<ul style="list-style-type: none"> <li>Groundwater Quality: Degradation of physical and chemical characteristics of groundwater.</li> <li>Groundwater Quantity: Change in groundwater levels.</li> </ul>	<ul style="list-style-type: none"> <li>Areas of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination (hectares).</li> </ul>	<ul style="list-style-type: none"> <li>Design stormwater management features to contain runoff and allow it to infiltrate locally.</li> <li>Restore land cover on unused parts of road construction footprint (construction camps, aggregate pits).</li> <li>Implement spill prevention, monitoring, control and response programs for road construction and operation.</li> <li>Minimize or avoid using salt solutions for dust / ice control.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative will intersect 1,888 ha of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative will intersect 485 ha of coarse-grained surficial deposits and bedrock that are potentially important for groundwater recharge and have elevated vulnerability to groundwater contamination.</li> </ul>
<b>Summary of Groundwater and Geochemistry:</b>					
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 4 is the preferred route for Segment 3– North of the Albany from the perspective of Groundwater and Geochemistry</b> in terms of reducing potential for impacting areas likely to have higher rates of groundwater recharge (infiltration) and highest vulnerability to contamination.</li> <li>Alternative 4 crosses over the least amount of area of coarse-grained and bedrock surficial materials.</li> <li>Alternative 1 crosses over the greatest amount of area of coarse-grained and bedrock surficial materials.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>Alternative 1 results in higher net effect than Alternative 4 due to its intersection with a higher area of coarse-grained and bedrock surficial materials. This comparative analysis evaluated two route alternatives based on the interaction of their PDAs and the representative indicator measures and did not consider the effects to groundwater and geochemistry at the local or regional scale (i.e., LSA or Regional Study Area; RSA). The comprehensive assessment of net effects to groundwater will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul>					
<b>Peatlands</b>					
Peatland Ecosystems	<ul style="list-style-type: none"> <li>Availability (decrease / increase of overall amount of peatland area).</li> <li>Distribution (changes to the arrangement and connectivity of Peatlands).</li> <li>Function and Composition (change in plant species composition or ecological function).</li> </ul>	<ul style="list-style-type: none"> <li>Peatland area (hectares) disturbed per alternative.</li> <li>Number of peatlands type fragmented.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Avoid using peatlands for staging, where possible.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for peatlands protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,046.00 ha of peatland and 17 peatland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 433.27 ha of peatland and 10 peatland ecosite types.</li> </ul>
<b>Summary of Peatlands:</b>					
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany Crossing from the perspective of Peatlands</b> as it results in smaller direct loss of peatland area and disturbance to a fewer number of peatland types.</li> </ul> <p><u>Peatland Area</u></p> <ul style="list-style-type: none"> <li>Alternative 4 is the most preferred as it results in the least direct loss of peatland area.</li> <li>Alternative 1 is the least preferred as it results in the greatest loss of peatland area.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Water</b>					
<p><u>Number of Peatland Types Fragmented</u></p> <ul style="list-style-type: none"> <li>Alternative 4 is the most preferred as it impacts the fewest number of peatland types.</li> <li>Alternative 1 is the least preferred as it impacts the greatest number of peatland types.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>Alternative 1 results in higher net effects than Alternative 4. This comparative analysis evaluated the three route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to peatland VCs at the local or regional scale (i.e., LSA or RSA). The predicted net effects have not considered all potential mitigation or design elements to maintain peatland function (e.g., hydrology) that may be applied at a later stage of project design. The comprehensive assessment of net effects to the peatland VCs will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>Note that for the purposes of the alternatives assessment, only the availability (area) of peatlands disturbed and the number of peatland types fragmented were used because these measures can be quantified and are unbiased. Loss of peatlands also reduces their overall function and ability to store carbon, so those indicators are indirectly being assessed by determining the area of peatlands lost and fragmented.</li> <li>This analysis is based on mapping that doesn't incorporate data collected during the 2023 field programs. This 2023 field information may refine the peatlands mapping that will be included in final reporting.</li> </ul>					
<b>Surface Water</b>					
Surface Water	<ul style="list-style-type: none"> <li>Surface Water Quantity.</li> <li>Surface Water Quality.</li> </ul>	<ul style="list-style-type: none"> <li>Total number of waterbody crossings.</li> <li>Flow regime (permanent vs. intermittent or ephemeral).</li> <li>Channel length and / or width or wetted area within the proposed corridor (to be tallied as a total for all of the crossing locations within a given segment).</li> <li>Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to flow conveyance and erosion and sedimentation processes.</li> <li>Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features (e.g., sensitive fish communities, areas of known channel instability).</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to blasting measures in accordance with the Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (Wright and Hopky, 1998).</li> <li>Measures to avoid unnecessary vehicle and machine idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas a minimum of 30 m from waterbodies.</li> </ul> </li> <li>Wash water from vehicles and equipment will not be allowed to enter a waterbody and will be conveyed to areas for infiltration, treated prior to discharge to the receiving environment, or hauled offsite.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>cross 18 waterbodies, all of which are inferred as permanent;</li> <li>intersect 22,804 m<sup>2</sup> of wetted area within the proposed corridor;</li> <li>cross 12 waterbodies (10,634 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>cross 3 waterbodies (9,191 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>cross 9 waterbodies, all of which are inferred as permanent;</li> <li>intersect 12,185 m<sup>2</sup> of wetted area within the proposed corridor;</li> <li>cross 5 waterbodies (8,502 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>cross 3 waterbodies (8,302 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>
<b>Summary of Surface Water:</b>					
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 3 – North of Albany Crossing for Surface Water</b>, given that Alternative 4 includes nine less crossings than Alternative 1 and includes seven less crossings targeted for crossing structure installation / maintenance and associated in-water work.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Water</b>					
<u>Net Effects</u>					
<ul style="list-style-type: none"> <li>The predicted net effect for each of the alternatives were evaluated to be equivalent, based on the understanding that, with the implementation of the recommended avoidance, mitigation, compensation, and enhancement measures (including properly sized and designed water crossing structures, installation and maintenance of appropriate erosion and sediment controls, and implementation of construction best management practices), the potential effects on surface water receivers are expected to be limited. As such, there is a negligible difference between the alternatives from the perspective of surface water.</li> </ul>					
<b>Notes:</b>					
The requirement for in-water determined as follows:					
<ul style="list-style-type: none"> <li>For waterbody crossings with bankfull widths less than 5 m, it is assumed that culverts would be used (requiring in-water work).</li> <li>For waterbody crossings with bankfull widths greater than or equal to 5 m and less than 25 m, it is assumed that clear span bridges would be used (no in-water work).</li> <li>For waterbody crossings greater than or equal to 25 m, it is assumed that bridges with piers and abutments would be used (requiring in-water work).</li> <li>For waterbody crossings in flooded / impounded wetlands where wetted widths were greater than bankfull width at the time of the assessment, it is assumed that in-water work would be required.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<b>Physiography, Terrain and Soils</b>					
Physiography, Terrain and Soils	Quantity and distribution of terrain units.	<ul style="list-style-type: none"> <li>Area of surficial materials disturbed per alternative.</li> <li>Area of potential land with permafrost processes.</li> <li>Area of class IV and V terrain stability per alternative.</li> <li>Number of significant landforms disturbed per alternative.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize areas of vegetation clearing and soil disturbance.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 2,427 ha of surficial materials;</li> <li>intersect 0 ha of potential land with permafrost;</li> <li>intersect 23 ha of Class IV (1% of alternative footprint) and 18 ha (1% of alternative footprint) of Class V terrain; and</li> <li>disturb 9 significant landforms.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 825 ha of surficial materials;</li> <li>intersect 0 ha of potential land with permafrost;</li> <li>intersect 16 ha of Class IV (2% of alternative footprint) and 18 ha (2% of alternative footprint) of Class V terrain; and</li> <li>disturb 2 significant landforms.</li> </ul> </li> </ul>
	Quantity and distribution of soil map units.	Area of soil disturbed (excludes non-soils such as bedrock and water) per alternative.	<ul style="list-style-type: none"> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, temporary construction camps, laydown areas).</li> <li>Minimize areas of vegetation clearing and soil disturbance.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for soil erosion, salvage and handling.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 2,330 ha of soil (96% of the alternative footprint).</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 823 ha of soil (100% of the alternative footprint).</li> </ul>
	Soil Quality / Productivity.	<ul style="list-style-type: none"> <li>Area of high-water erosion risk disturbed per alternative.</li> <li>Area of high wind erosion risk disturbed per alternative.</li> <li>Amount of soil that is considered suitable for reclamation.<sup>2</sup></li> <li>Area of high compaction risk disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>Use clearing equipment that minimizes surface disturbance, soil compaction and topsoil loss (e.g., equipment with low ground pressure tracks or tires, blade shoes, and brushes), where feasible.</li> <li>Where soils are prone to wind erosion, tackify, cover, seed, and / or apply water during periods of high erosion potential (e.g., summer and fall).</li> <li>Minimize soil disturbance by building on bedrock, where feasible.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for soil erosion, salvage and handling.</li> <li>Construct in winter to avoid compaction, where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 0 ha of area with high-water erosion risk;</li> <li>disturb 355 ha (15% of alternative footprint) of area with high wind erosion risk;</li> <li>disturb 917 ha (38% of alternative footprint) of soil that is considered suitable for reclamation; and</li> <li>intersect 161 ha (7% of alternative footprint) of area with high compaction risk.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to: <ul style="list-style-type: none"> <li>disturb 0 ha of area with high-water erosion risk;</li> <li>disturb 270 ha (34% of alternative footprint) of area with high wind erosion risk;</li> <li>disturb 124 ha (15% of alternative footprint) of soil that is considered suitable for reclamation; and</li> <li>intersect 34 ha (4% of alternative footprint) of area with high compaction risk.</li> </ul> </li> </ul>

**Summary of Physiography, Terrain and Soils:**

- Overall
- Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany Crossing from the perspective of Physiography, terrain and soils, as this alternative will have lower net effects as it is anticipated to disturb fewer significant landforms and a smaller area of surficial materials, soil, areas of wind erosion risk, soil suitable for reclamation and soil with high risk of compaction than Alternative 1.
  - Alternative 1 would remove the largest area of surficial materials.
  - Although Alternative 4 would affect a larger percentage (4%) of potentially unstable ground (35 ha total), Alternative 1 is significantly larger in area and would affect a larger area of potentially unstable ground with 42 ha (2%).
  - No permafrost processes were identified in either of the two alternatives.
  - Alternative 4 would affect seven fewer significant landforms than Alternative 1.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<ul style="list-style-type: none"> <li>Alternative 1 would affect a lower percentage of soil (96%); however, Alternative 1 is significantly larger in area and would disturb more soil.</li> <li>Neither alternative has areas identified as being at a potentially high risk for water erosion.</li> <li>Although a higher percentage of Alternative 4 intersects areas of high wind erosion risk (34%. 270 ha), Alternative 1 would affect a larger area (15%, 355 ha).</li> <li>Alternative 1 would affect a higher percentage of soils rated as being suitable for reclamation, and a larger area than Alternative 4.</li> <li>Alternative 1 would affect a higher percentage of soils rated as having a high risk for compaction, and a larger area than Alternative 4.</li> </ul>					
<b>Net Effects</b>					
<ul style="list-style-type: none"> <li>Alternative 1 results in higher net effects than those of Alternative 4 due to higher disturbance of soil and terrain and effects on soil quality. This comparative analysis evaluated three route alternatives based on the interaction of their PDAs and the representative indicator measures, and did not consider the effects to physiography, terrain and soil VC at the local or regional scale (i.e., LSA or RSA). Therefore, as the PDA for each alternative is anticipated to permanently remove or disturb measures of the proposed indicators, net effects may be high for both alternatives. The comprehensive assessment of net effects to the physiography, terrain and soils VC, will be completed on the preferred route selected, and may result in a different determination of predicted net effects.</li> </ul>					
<b>Notes:</b>					
<ol style="list-style-type: none"> <li>The number of significant landforms noted is subjective and may be a conservative value. This measure will be re-evaluated with Indigenous Knowledge input, and information from the wildlife and vegetation disciplines. As a result, the data presented here may differ from the final effects analysis.</li> <li>Soil with a rating of Good, Fair or Poor were considered suitable for reclamation.</li> </ol> <ul style="list-style-type: none"> <li>Some numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.</li> </ul>					
<b>Ungulates</b>					
Moose	<ul style="list-style-type: none"> <li>Habitat availability.</li> <li>Habitat distribution.</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of confirmed and suitable habitat features disturbed per segment alternative (e.g., area of high suitability habitat, number of suitable moose aquatic feedings areas, known mineral licks).</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> <li>Alternative 4 minimizes the amount of high suitability that will be removed.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 85 ha of high suitability habitat within the PDA, 911 ha of high suitability habitat within the PDA including a 500-m buffer and is not anticipated to disturb any suitable habitat features.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 5 ha of high suitability habitat within the PDA, 45 ha of high suitability habitat within the PDA including a 500-m buffer and is not anticipated to disturb any suitable habitat features.<sup>1</sup></li> </ul>
Caribou	<ul style="list-style-type: none"> <li>Habitat availability.</li> <li>Habitat distribution – includes spatial extent and distribution of General Habitat Description (GHD) Category 1, 2, and 3 habitats (MNR 2013) and availability and distribution of habitat which contain biophysical attributes necessary for caribou seasonal and life stage activities (ECCC, 2019).</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of known and potential Category 1 GHD WINTER USE AREAS that would be impacted per segment alternative.</li> <li>Area (hectares) of known and potential Category 1 GHD NURSERY AREAS that would be impacted per segment alternative.</li> <li>Area (hectares) of known and potential Category 1 GHD TRAVEL CORRIDOR AREAS that would be impacted per segment alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Avoid sensory disturbances within 10 km of known high-use areas during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> <li>Alternative 4 minimizes the amount of winter use habitat that will be removed.</li> <li>Alternative 4 avoids the core areas (50% Kernel Density Estimation; KDE) of known or potential nursery areas.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the following known and potential Category 1 GHD winter use areas, nursery areas and travel corridors: <ul style="list-style-type: none"> <li><b>Winter Use Areas:</b> 820 ha within the PDA, 5,315 ha within the PDA including a 500-m buffer;<sup>1</sup></li> <li><b>Nursery Areas:</b> 0 ha within the PDA, 6 ha within the PDA including a 500-m buffer;<sup>1</sup></li> <li><b>Travel Corridors:</b> 95 ha within the PDA, 1,203 ha within the PDA including a 500-m buffer.<sup>1</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>This alternative is not anticipated to disturb any known and potential Category 1 General Habitat nursery areas or travel corridors; however, it is anticipated to disturb the following known and potential Category 1 GHD winter use areas: <ul style="list-style-type: none"> <li><b>Winter Use Areas:</b> 228 ha within the PDA, 1,932 ha within the PDA including a 500-m buffer.<sup>1</sup></li> </ul> </li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<b>Summary of Ungulates:</b>					
<i>Overall</i>					
<ul style="list-style-type: none"> <li>• <b>Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany Crossing from the perspective of Ungulates</b>, as it is predicted to have higher net effects through the anticipated removal of a larger area of high suitability moose and caribou habitat compared to Alternative 1.</li> <li>• Both alternatives have the potential to affect ungulate habitat, including removal of sensitive areas and reducing connectivity.</li> <li>• Alternative 1 will directly remove more moose high suitability habitat than Alternative 4 (85 ha compared to 5 ha).</li> <li>• Alternative 1 will remove more caribou winter use areas than Alternative 4 (820 ha compared to 228 ha direct habitat loss).</li> <li>• Alternative 1 will remove more travel corridors than Alternative 4 (95 ha direct habitat loss compared to zero).</li> <li>• When the 95% KDE polygons are evaluated, Alternative 1 removes substantially more Category 1 areas than Alternative 4), which are areas within the range which have lowest tolerance to alteration before their function in supporting caribou is compromised (MNR 2013).</li> </ul>					
<i>Net Effects</i>					
<ul style="list-style-type: none"> <li>• Alternative 1 results in higher net effects for ungulates, both moose and caribou. It is important to note that both alternative segments will remove caribou habitat, which may be depended on directly or indirectly for life processes, even if it is not considered Category 1. Indirect effects of habitat removal, including sensory disturbance, increased mobility for predators and hunters, and increased vehicle traffic, cannot be fully mitigated regardless of the Alternative segment. As a result, both alternative routes for the North of Albany Crossing may potentially have high net effects for caribou. This comparative analysis evaluated the two route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to moose or caribou at the local or regional scale (i.e., LSA or RSA). The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the ungulates will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul>					
<b>Notes:</b>					
<ol style="list-style-type: none"> <li>1. A 500 m buffer is used to capture indirect disturbances to habitat features such as noise and dust.</li> </ol> <ul style="list-style-type: none"> <li>• Known Category 1 areas are derived from Ontario Government Caribou GHD for Forest-dwelling caribou (MNR 2013). The identification of "potential new" Category 1 winter use areas and nursery areas is based on 50% KDE polygons derived from MFFN and Ministry of Natural Resources (MNR) collar data between 2020 to 2023. The 50% KDE represents the core area used during the date periods identified by Ontario for the current GHD Category 1 areas. "Potential new" travel corridors are derived from 95% KDE derived from MFFN and MNR collar data between 2020 and 2023. The 95% KDE was used for the travel corridors because travel corridors are more linear in extent and do not have core areas relative to winter use and nursery areas. In areas where travel corridors overlap winter use or nursery areas, they are not double counted in the calculation of habitat removed.</li> <li>• This information may be re-evaluated with Indigenous Knowledge input and / or additional collar data, when available. As a result, the data presented here may differ from the final effects analysis.</li> </ul>					
<b>Wildlife</b>					
Bats (including SAR – Little Brown Myotis, Northern Myotis, Tri-coloured Bat)	<ul style="list-style-type: none"> <li>• Species presence.</li> <li>• Relative abundance (spatially and temporally).</li> <li>• Habitat availability and distribution (spatially and temporally) including critical habitat for SAR.</li> </ul>	<ul style="list-style-type: none"> <li>• Area (hectares) of moderate to high suitability bat maternity roost habitat disturbed per alternative.</li> <li>• Area (hectares) of foraging habitat (open wetlands and waterbodies adjacent to roosting habitat).</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid clearing of suitable maternity roost habitat during the bat active season.</li> <li>• Limit the Project footprint to the extent feasible.</li> <li>• Minimize disturbances during sensitive periods.</li> <li>• Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is anticipated to disturb: <ul style="list-style-type: none"> <li>○ 146.06 ha of moderate to high suitability bat maternity roost habitat; and</li> <li>○ 259.32 ha of foraging habitat.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• This alternative is anticipated to disturb: <ul style="list-style-type: none"> <li>○ 230.42 ha of moderate to high suitability bat maternity roost habitat; and</li> <li>○ 110 ha of foraging habitat.</li> </ul> </li> </ul>
Fur Bearers (American Marten)	<ul style="list-style-type: none"> <li>• Species presence.</li> <li>• Relative abundance (spatially and temporally).</li> <li>• Habitat availability and distribution (spatially and temporally) including critical habitat for SAR.</li> </ul>	<ul style="list-style-type: none"> <li>• Relative abundance of furbearers (American Marten).<sup>1</sup></li> <li>• Area (hectares) of moderate / high-quality American Marten habitat disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>• Limit the Project footprint to the extent feasible.</li> <li>• Minimize disturbances during sensitive periods.</li> <li>• Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative has a relative abundance of 0.74 American Marten and is anticipated to disturb 1,926.47 ha of moderate / high-quality American Marten habitat.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative has a relative abundance of 1.49 American Marten and is anticipated to disturb 620.8 ha of moderate / high-quality American Marten habitat.</li> </ul>
Fur Bearers (SAR Wolverine)		<ul style="list-style-type: none"> <li>• Presence / relative abundance of wolverine females and individuals of unknown sex per alternative. Presence of observed denning areas (from field observations).<sup>2</sup></li> <li>• Relative abundance of wolverine.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• If a denning area is identified, avoid construction activities within 4 km during the wolverine denning season.</li> <li>• Limit the Project footprint to the extent feasible.</li> <li>• Minimize disturbances during sensitive periods.</li> <li>• Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative has a relative abundance of 1.33 wolverine, the presence or abundance of 1 female wolverine and 10 wolverine individuals of unknown sex.</li> </ul>	<ul style="list-style-type: none"> <li>• This alternative has a relative abundance of 0.83 wolverine, the presence or abundance of 1 female wolverine and 5 wolverine individuals of unknown sex.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
Amphibians and Reptiles	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (if possible both spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally).</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of high suitability breeding ecosites per alternatives (amphibians).</li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during sensitive periods.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,158.83 ha of high suitability breeding ecosites.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 423.19 ha of high suitability breeding ecosites.</li> </ul>
<b>Summary of Wildlife:</b>					
<u>Overall</u>					
<ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany from the perspective of Wildlife</b>, as it is anticipated that it would result in lower effects on American marten, wolverine, and amphibians.</li> <li>Alternative 1 is the least preferred for alternative of Segment 3 – North of Albany, as it is anticipated that it would result in higher net effects on American marten, wolverine, and amphibians.</li> </ul>					
<u>Bats</u>					
<ul style="list-style-type: none"> <li>It is anticipated that Alternative 1 and Alternative 4 would have similar net effects on Bats. Alternative 1 would result in a lower direct loss of bat maternity roost habitat, and Alternative 4 would result in a lower direct loss of bat foraging habitat.</li> </ul>					
<u>Furbearers (American Marten)</u>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred for American Marten, as it results in the least direct loss of moderate / high-quality American marten habitat.</li> <li>Alternative 1 West is the least preferred for American Marten, as it results in the greatest direct loss of moderate / high-quality American marten habitat.</li> </ul>					
<u>Furbearers (Wolverine)</u>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred for Wolverine, as it has the lowest wolverine relative abundance and has the fewest number of observations of female wolverine and wolverines of unknown sex.</li> <li>Alternative 1 West is the least preferred for Wolverine, as it the highest wolverine relative abundance and has the largest number of observations of female wolverine and wolverines of unknown sex.</li> </ul>					
<u>Amphibians and Reptiles</u>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred for Amphibians and Reptiles, as it results in the least direct loss of suitable amphibian breeding habitat.</li> <li>Alternative 1 West is the least preferred for Amphibians and Reptiles, as it results in the greatest direct loss of suitable amphibian breeding habitat.</li> </ul>					
<u>Net Effects</u>					
<ul style="list-style-type: none"> <li>Alternative 1 is predicted to result in higher net effects than Alternative 4 due to its effects on American marten, wolverine, and amphibians / reptiles. The predicted net effects have not considered all potential mitigation that may be applied. It is important to note that all route segments that bisect wolverine habitat have a direct effect as this species utilizes large home ranges and they rely on intact areas of wilderness directly or indirectly for life processes. Indirect effects of habitat removal for this species at risk (SAR), including sensory disturbance and increased vehicle traffic, cannot be fully mitigated regardless of the Alternative segment. Until the mitigation measures are confirmed, and the design of the project is further determined, all alternative routes are assessed as having potentially high net effects for wildlife. Net effect assessment is subject to change based on the implementation of additional mitigation. The comprehensive review of net effects for wildlife and wildlife habitat will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul>					
<b>Notes:</b>					
<ol style="list-style-type: none"> <li>Relative abundance metrics are calculated as the average number of sightings (wolverine) or tracks (American marten) per station for stations that overlap route alternatives.</li> <li>Female observations are split into the total number of known female animals observed per route segment. Wolverines of unknown sex are the sum of the total known animals with unknown sex and unidentifiable individuals. Unidentifiable individuals are assumed to be unique individuals.</li> </ol>					
<b>Vegetation</b>					
Wetland and Riparian Ecosystems	<ul style="list-style-type: none"> <li>Availability (abundance spatially and temporally).</li> <li>Distribution.</li> <li>Function and Composition.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of wetland and riparian ecosystems disturbed per alternative.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Avoid using wetland and riparian areas for staging, where possible.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 1,178.96 ha of wetland and riparian ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 430.45 ha of wetland and riparian ecosystems.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
			<ul style="list-style-type: none"> <li>following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation and wetland protection and mitigation.</li> </ul>		
Upland Ecosystems	<ul style="list-style-type: none"> <li>Availability (abundance spatially and temporally).</li> <li>Distribution.</li> <li>Function and Composition.</li> </ul>	<ul style="list-style-type: none"> <li>Number of upland ecosite types disturbed per alternative.<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 16 upland ecosite types.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 12 upland ecosite types.</li> </ul>
Traditional Use Plants and SAR Plant Populations (Including species with special conservation status or rarity in the province)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Accessibility to traditional use of plants.</li> <li>Accessibility to traditional use of plants.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of highly suitable and highly accessible (High = score of 1.5 – 2.0) habitat for Traditional Use Plants disturbed per alternative.</li> <li>Area (hectares) of suitable habitat for SAR / SCC Plants (Black Ash, Northern Marsh Violet) disturbed per alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 735.81 ha of highly suitable and highly accessible habitats for Traditional Use Plants and 2,431.46 ha of suitable SAR / SCC habitat.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb 269.91 ha of highly suitable and highly accessible habitats for Traditional Use Plants and 828.26 ha of suitable SAR / SCC habitat.</li> </ul>

**Summary of Vegetation:**

Overall

- Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany Crossing from the perspective of Vegetation as it has lower net effects through a smaller direct loss of wetland and riparian ecosystems, disturbance of fewer upland ecosite types, smaller direct loss of highly suitable and highly accessible habitats for Traditional Use Plants, and it has the least impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).

Wetlands and Riparian Ecosystems

- Alternative 4 is the most preferred as it results in the least direct loss of wetland and riparian ecosystems.
- Alternative 1 is the least preferred as it results in the greatest direct loss of wetland and riparian ecosystems.

Upland Ecosystems

- Alternative 4 is the most preferred as it disturbs the fewest upland ecosite types.
- Alternative 1 is the least preferred as it disturbs the greatest number of ecosite types.

Traditional Use Plants and SAR / SCC Plant Populations

- Alternative 4 is the most preferred as it results in the least direct loss of highly suitable and highly accessible habitats for Traditional Use Plants.
- Alternative 1 is the least preferred as it results in the greatest direct loss of highly suitable and highly accessible habitats for Traditional Use Plants.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
<ul style="list-style-type: none"> <li>Alternative 4 is the most preferred for SAR / SCC Plant Populations as it has the least impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).</li> <li>Alternative 1 is the least preferred SAR / SCC Plant Populations as it has the greatest impact on areas of suitable habitat for these species (i.e., Black Ash and Northern Marsh Violet).</li> </ul> <p><b>Net Effects</b></p> <ul style="list-style-type: none"> <li>Alternative 1 results in higher net effects than Alternative 4. This comparative analysis evaluated the two route alternatives based on the interaction of their PDAs and the representative indicator measures and did not consider the effects to vegetation VCs at the local or regional scale (i.e., LSA or RSA). Therefore, as the PDA for each alternative is anticipated to permanently remove or disturb wetland, riparian and upland ecosystems, as well as highly suitable and highly accessible habitats for Traditional Use Plants and suitable habitat for SAR / SCC, net effects of both alternatives may be high. The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the vegetation VCs will be completed on the preferred route selected and may result in a different determination of predicted net effects to these individual VCs.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>Note that for the purposes of the alternatives assessment, only the availability of wetland and riparian ecosystems indicator was included. Area of loss as a metric was used because the area of direct impact would be the most important on the ecosystem. The more area that is removed, the less likely the ecosystem would be able to maintain its functions. The Distribution, Function and Composition Indicators will be addressed for the preferred alternative in the EA / IS Document.</li> <li>Number of ecosite types as a metric is proposed because this provides a measure of impact on forest biodiversity rather than just area which could be attributed to the overall length of the route alternative rather than where the alternative is specifically located.</li> </ol> <ul style="list-style-type: none"> <li>The Project has taken a preliminary conservative approach to classifying SAR and SCC habitats and the mapping is based on a limited amount of field information. The mapping that informed this evaluation is expected to be refined for final reporting.</li> <li>This analysis is based on mapping that doesn't incorporate data collected during the 2023 field programs. This 2023 field information may refine the vegetation mapping that will be included in final reporting.</li> </ul>					
<b>Birds</b>					
Species at Risk Forest and Wetland Birds  (e.g., Canada warbler, chimney swift, eastern whip-poor-will, eastern wood-pewee, evening grosbeak, olive-sided flycatcher, bank swallow, barn swallow, black tern, rusty blackbird, yellow rail)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally) of SAR.</li> <li>Habitat availability and distribution (spatially and temporally) including critical habitat (where known), were defined for SAR.</li> </ul>	<ul style="list-style-type: none"> <li>Area (hectares) of moderate to high suitability bird SAR habitat disturbed in the PDA.</li> <li>Area of provincial Endangered Species Act (ESA) regulated habitat or federal <i>Species at Risk Act</i> (SARA) critical habitat for SAR birds.</li> </ul>	<ul style="list-style-type: none"> <li>Avoid clearing of suitable bird nesting habitat during the breeding bird period.</li> <li>Limit the Project footprint to the extent feasible.</li> <li>Minimize disturbances during the breeding bird period.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the moderate to high suitability habitat of the following bird SAR: <ul style="list-style-type: none"> <li>Canada warbler: 1,296.8 ha;</li> <li>Chimney swift: 0.0 ha;</li> <li>Common nighthawk: 866.4 ha;</li> <li>Eastern whip-poor-will: 12.1 ha;</li> <li>Eastern wood-pewee: 138.7 ha;</li> <li>Evening grosbeak: 1,265.5 ha;</li> <li>Lesser yellowlegs: 1,567.4 ha;</li> <li>Olive-sided flycatcher: 1,531.3 ha;</li> <li>Bald eagle: 474.8 ha;</li> <li>Peregrine falcon: 0.0 ha;</li> <li>Short-eared owl: 13.6 ha;</li> <li>Bank swallow: 0.0 ha;</li> <li>Barn swallow: 0.0 ha;</li> <li>Black tern: 3.5 ha;</li> <li>Rusty blackbird: 1,213.5 ha; and</li> <li>Yellow rail: 13.6 ha.</li> </ul> </li> <li>This alternative is not anticipated to disturb any known provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>This alternative is anticipated to disturb the moderate to high suitability habitat of the following bird SAR: <ul style="list-style-type: none"> <li>Canada warbler: 655.1 ha;</li> <li>Chimney swift: 0.0 ha;</li> <li>Common nighthawk: 267.3 ha;</li> <li>Eastern whip-poor-will: 11.2 ha;</li> <li>Eastern wood-pewee: 231.8 ha;</li> <li>Evening grosbeak: 399.7 ha;</li> <li>Lesser yellowlegs: 449.6 ha;</li> <li>Olive-sided flycatcher: 263.1 ha;</li> <li>Bald eagle: 251.8 ha;</li> <li>Peregrine falcon: 0.0 ha;</li> <li>Short-eared owl: 5.5 ha;</li> <li>Bank swallow: 0.0 ha;</li> <li>Barn swallow: 0.0 ha;</li> <li>Black tern: 1.5 ha;</li> <li>Rusty blackbird: 433.9 ha; and</li> <li>Yellow rail: 2.3 ha.</li> </ul> </li> <li>This alternative is not anticipated to disturb any known provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.<sup>1</sup></li> </ul>
Raptors (e.g., bald eagle)	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally).</li> </ul>	<ul style="list-style-type: none"> <li>Number of habitat features and area (hectares) disturbed: <ul style="list-style-type: none"> <li>raptor nest locations; and</li> <li>stopover sites (if present).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Limit the Project footprint to the extent feasible.</li> <li>Avoid sensory disturbances within 800 m of known bald eagle nests.</li> <li>Minimize risk of mortality during construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb any stopover sites, but is anticipated to disturb 1 bald eagle nests (10.6 ha).</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb known raptor nests or stopover sites.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Land</b>					
Shorebirds	<ul style="list-style-type: none"> <li>Species presence.</li> <li>Relative abundance (spatially and temporally).</li> <li>Habitat availability and distribution (spatially and temporally).</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of confirmed and suitable habitat features disturbed (e.g., stopover sites).<sup>2,3,4</sup></li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb confirmed or suitable shorebird habitat features.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb confirmed or suitable shorebird habitat features.</li> </ul>
Waterfowl	<ul style="list-style-type: none"> <li>Species presence</li> <li>Relative abundance (spatially and temporally)</li> <li>Habitat availability and distribution (spatially and temporally)</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of confirmed and suitable habitat features disturbed (e.g., stopover sites).<sup>2,3,4</sup></li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb confirmed or suitable waterfowl habitat features.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative is not anticipated to disturb confirmed or suitable waterfowl habitat features.</li> </ul>

**Summary of Birds:**

*Overall*

- Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany from the perspective of Birds**, as it is anticipated that it would result in the lowest net effect on bird SAR and raptors. No difference in potential effects to shorebirds or waterfowl based on alternatives was found with the selected measures.

*Species at Risk*

- Alternative 4 is the most preferred for SAR, as it results in the least direct loss of moderate to high suitability habitat for bird SAR.
- Alternative 1 is the least preferred for SAR, as it results in the greatest direct loss of moderate to high suitability habitat for bird SAR.
- Alternative 1 and Alternative 4 both avoid the direct loss of any provincial ESA regulated habitat or federal SARA critical habitat for SAR birds.
- Alternative 4 minimizes the amount of moderate to high suitability bird SAR habitat that will be removed (avoidance measure).

*Raptors*

- Alternative 4 is the most preferred for Raptors, as it results in no direct loss of habitat features for raptors (i.e., raptor nest locations and their associated buffers, stopover sites).
- Alternative 1 is the least preferred for Raptors, as it results in the greatest direct loss of habitat features for raptors.
- Alternative 4 avoids the removal of known raptor nests.
- Alternative 1 and Alternative 4 avoid the removal of potential stopover sites.<sup>1</sup>

*Shorebirds*

- Both Alternative 1 and Alternative 4 avoid removing suitable habitat features for Shorebirds (e.g., stopover sites).<sup>2,3,4</sup>

*Waterfowl*

- Both Alternative 1 and Alternative 4 avoid removing suitable habitat features for Waterfowl (e.g., stopover sites).<sup>2,3,4</sup>

*Net Effects*

- Alternative 1 results in higher net effects than Alternative 4 due to its effects on bird SAR and raptors. This comparative analysis evaluated the two route alternatives based on the direct interaction of their PDAs and the representative indicator measures and did not consider the effects to bird VCs at the local or regional scale (i.e., LSA or RSA). The predicted net effects have not considered all potential mitigation that may be applied. The comprehensive assessment of net effects to the bird VCs will be completed on the preferred route.

**Notes:**

- Stopover sites for raptors were defined as waterbodies and watercourses surveyed during baseline field surveys with greater than two observations of raptors.
- The Natural Heritage Information Centre was searched for known provincial waterfowl and shorebird staging areas. No data were found for these measures.
- Suitable habitat features for shorebirds and waterfowl were defined as waterbodies and watercourses surveyed during baseline field surveys.
- Confirmed habitat features for shorebirds and waterfowl were defined as waterbodies and watercourses surveyed during baseline field surveys plus a 100 m buffer where shorebirds or waterfowl were observed during baseline field surveys.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Acoustic and Vibration Environment</b>					
Acoustic and Vibration Environment	<ul style="list-style-type: none"> <li>Change to noise and vibration.</li> </ul>	<ul style="list-style-type: none"> <li>PDA footprint area.</li> <li>Total road length.</li> <li>Number of sensitive points of reception (PORs) within 500 m of the roadway.</li> </ul>	<ul style="list-style-type: none"> <li>Comply with local municipal noise by-laws and the Ministry of the Environment, Conservation and Parks <i>Model Municipal Noise Control Bylaw</i> (i.e., NPC-115).</li> <li>Generally, limit construction activities to the daytime period (i.e., 07:00 to 19:00) where possible. If nighttime construction activities are required, a review of whether additional mitigation measures are needed should be carried out.</li> <li>Maintain equipment and machinery used on site in good working conditions through regular maintenance and inspection.</li> <li>Design access roads to minimize reversing, which is expected to minimize use of backup beepers, where possible.</li> <li>Locate and operate construction equipment as far as possible from PORs.</li> <li>Notify Indigenous communities, landowners, and relevant stakeholders of the planned construction schedule before the start of construction and prior to specific activities that may be noisy or generate vibration.</li> <li>Investigate noise or vibration concerns as they arise through a complaint resolution mechanism whereby persons can contact the proponent if there are perceived noise or vibration issues.</li> <li>Operate vehicles and equipment such that impulsive noise is minimized, where possible.</li> <li>Develop a construction vibration work plan prior to the start of construction describing the construction schedule, list of construction equipment, list of POR locations, applicable guidance documents including criteria and municipal by-laws (i.e., residential, heritage structures and utilities) and control measures.</li> <li>Avoid operating equipment expected to be a significant source of vibration simultaneously. Vibration levels could be less when operating separately.</li> <li>Construction blasting will be carried out in compliance with OPSS 120 and NPC-119. All blasts which might impact local structures or disrupt humans should be monitored for ground and air vibrations.</li> <li>Aggregate pit blasting will be carried out to comply with the conditions provided in the license or aggregate permit.</li> <li>Blasting delays and blast mats will be used, as appropriate, to control vibration and fly rock as required.</li> </ul>	<ul style="list-style-type: none"> <li>The PDA for this alternative is 2,427 ha, with a total road length of 67.5 km. There are 77 potential PORs within 500 m of the roadway that could be impacted by noise and vibration.</li> </ul>	<ul style="list-style-type: none"> <li>The PDA for this alternative is 825 ha, with a total road length of 34 km. There are 57 potential PORs within 500 m of the roadway that could be impacted by noise and vibration.</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Summary of Acoustic and Vibration Environment:</b>					
<p><u>Overall</u></p> <ul style="list-style-type: none"> <li>Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany from the perspective of the Acoustic and Vibration Environment as it has the smallest PDA footprint, shortest road length and smallest number of potential PORs within 500 m of the roadway.</li> <li>Alternative 1 is the least preferred route alternative for Segment 3 – North of the Albany from the perspective of acoustic and vibration environment as it has the largest PDA footprint, longest road length, and largest number of potential PORs within 500 m of the roadway.</li> <li>In general, the larger the PDA footprint, the higher the likelihood of a larger number of potential PORs located in the acoustic environment study areas.</li> <li>In general, the longer the road, the higher the likelihood of a larger number of potential PORs exposed to noise from Project operations (i.e., a longer-term effect).</li> <li>In general, the more potential PORs within 500 m of the roadway, the higher the likelihood of a larger number of potential PORs exposed to noise from the Project. Note that the POR counts above are based on a preliminary review and the specific land uses have not been confirmed to be noise or vibration sensitive.</li> </ul> <p><u>Net Effects</u></p> <ul style="list-style-type: none"> <li>It is expected that each of the route alternatives can be designed such that the outcome of the acoustic and vibration environment assessment of net effects would be equal. As such, net effects from each alternative to the noise and vibration environment are predicted to be equivalent. This comparative analysis evaluated the route alternatives based on the PDAs, road length, and a preliminary analysis of the number of potential PORs within 500 m of the roadway and did not consider the expected Project noise and vibration levels in the LSA or the proximity of potential PORs to the Project. The comprehensive review of potential PORs and assessment of net effects for the acoustic and vibration environment will be completed on the preferred route selected and may result in a different determination of predicted net effects.</li> </ul>					
<b>Atmospheric and GHG</b>					
Air Quality and GHG	<ul style="list-style-type: none"> <li>Number of sensitive receptors within 500 m of the roadway.</li> <li>Land use type which is disturbed based on route selection (i.e., wetland, forest type, peatlands).</li> <li>Operating equipment needed for each route selection (if one route selection requires increased construction efforts).</li> <li>Overall road / clearing area of each route selection.</li> </ul>	<ul style="list-style-type: none"> <li>Number</li> <li>Bedrock (ha)</li> <li>Treed (ha)</li> <li>Water (ha)</li> <li>Wetland (ha)</li> <li>Length of Road (km)</li> <li>Area (ha)</li> </ul>	<ul style="list-style-type: none"> <li>Air Quality Mitigation Options: <ul style="list-style-type: none"> <li>maintain and keep equipment in proper working order;</li> <li>use fuel efficient equipment where possible;</li> <li>avoid idling where possible and develop an anti-idling policy;</li> <li>optimize material selection, procurement and shipping;</li> <li>implement fugitive dust controls such as scheduled road watering, stockpile watering or covering erodible surfaces where appropriate;</li> <li>implement proper storage and handling procedures of fuel;</li> <li>optimize blasting and land clearing activities to reduce overall fuel and explosive usage; and</li> <li>where possible reuse or salvage wood materials to prevent burning activities for disposal.</li> </ul> </li> <li>GHG Mitigation Options: <ul style="list-style-type: none"> <li>maintain and keep equipment in proper working order;</li> <li>use fuel efficient equipment where possible;</li> <li>avoid idling where possible and develop an anti-idling policy;</li> <li>optimize material selection, procurement and shipping;</li> <li>consider carbon offsets through reforestation;</li> <li>where possible reduce the amount of land clearing or disturbance activities; and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>77</li> <li>-</li> <li>1,547</li> <li>38</li> <li>842</li> <li>67.69</li> <li>2,426.60</li> </ul>	<ul style="list-style-type: none"> <li>57</li> <li>-</li> <li>405</li> <li>7</li> <li>414</li> <li>34.17</li> <li>824.99</li> </ul>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
			<ul style="list-style-type: none"> <li>strategically develop construction and equipment usage schedules to reduce overall fuel consumption.</li> </ul>		
<b>Summary of Atmospheric and GHG:</b>					
<i>Overall</i>					
<ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany from the perspective of Atmospheric and GHG</b> – this is based on Alternative 4 having the least number of sensitive receptors and least amount of project area disturbed.</li> <li>The total number of receptors which may be impacted by air quality emissions from the project is lowest for Alternative 4. It should be noted that receptor location may influence the magnitude of effects experienced at each receptor.</li> <li>At this time, it is unknown based on land classification changes the potential impacts that carbon sinks and sequestrations will have on overall GHG emissions. Based on data available at this time, Alternative 4 has the least disturbed area of carbon sinks. The magnitude of loss of carbon sinks will vary based on the specifics of each land use characteristics.</li> <li>The length of road segment is lower for Alternative 4, this may result in a decrease in air quality and GHG emissions during construction phases. Total road length may or may not influence operating equipment duration based on route specific construction requirements.</li> <li>Total area required to be cleared is lowest for Alternative 4, and this may result in a decrease in air quality and GHG emissions during the construction phase.</li> </ul>					
<i>Net Effects</i>					
<ul style="list-style-type: none"> <li>The net effects on the atmospheric and GHG VC were predicted to be equivalent for both alternatives. Detailed modelling is required to determine potential net effects. At this time, emission rates for both air quality pollutants and GHGs are not estimated due to uncertainty in equipment usage and land cover changes. It should be noted that sensitive receptor location and meteorological data inputs may influence the severity of net effects. The net effect rating is subject to change pending on detailed modelling / calculations as well as implementation of additional mitigation.</li> </ul>					
<b>Cultural Heritage</b>					
Archaeological Sites and Resources	<ul style="list-style-type: none"> <li>Previously identified archaeological sites.</li> </ul>	<ul style="list-style-type: none"> <li>The net effects to archaeological resources will be evaluated.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Number of previously identified archaeological sites.</li> <li>Areas of cultural significance raised by local Indigenous Nations.</li> <li>Number of resources identified.</li> </ul>	<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>No registered archaeological sites; however, archaeological potential is present within much of the alternative.</li> </ul>
	<ul style="list-style-type: none"> <li>Areas of cultural significance raised by local Indigenous Nations.</li> </ul>		<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> <li>Incorporate information received by Indigenous Nations in reporting.</li> <li>Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services. In addition, consultation with relevant Indigenous communities will be initiated in the event that archaeological resources or human remains are discovered.</li> </ul>	<ul style="list-style-type: none"> <li>Area has raised cultural significance by local Indigenous Nations.</li> </ul>	<ul style="list-style-type: none"> <li>Area has raised cultural significance by local Indigenous Nations.</li> </ul>
	<ul style="list-style-type: none"> <li>Proximity to water.</li> </ul>		<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>
	<ul style="list-style-type: none"> <li>Soil texture and drainage.</li> </ul>		<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>
	<ul style="list-style-type: none"> <li>Glacial geomorphology, elevated topography.</li> </ul>		<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological potential is present within much of the alternative.</li> </ul>
	<ul style="list-style-type: none"> <li>Resource areas including food or medicinal plants, scarce raw materials.</li> </ul>		<ul style="list-style-type: none"> <li>Complete all outstanding archaeological assessments.</li> </ul>	<ul style="list-style-type: none"> <li>Area has food or medicinal plant resources.</li> </ul>	<ul style="list-style-type: none"> <li>Area has food or medicinal plant resources.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
				<b>No discernable difference</b>	<b>No discernable difference</b>
				<b>No discernable difference</b>	<b>No discernable difference</b>
				<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
	• Areas of early 19th century settlement and transportation routes.		• Complete all outstanding archaeological assessments.	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source. <b>No discernable difference</b>	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source. <b>No discernable differences</b>
	• Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants.		• Complete all outstanding archaeological assessments.	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source. <b>No discernable difference</b>	• Archaeological potential is present within much of the alternative, Albany River is a significant potable water source. <b>No discernable difference</b>
Built Heritage Resources / Cultural Heritage Landscapes	• Animal, Fish, and Plant Harvest Areas (MFFN).	<ul style="list-style-type: none"> <li>The net effects to build heritage resources and cultural heritage resources will be evaluated in the Cultural Heritage Report.</li> <li>Number of resources identified.</li> </ul>	<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Animal, Fish and Plant Harvest Areas.</li> <li>If direct adverse impacts are anticipated to an Animal, Fish, and Plant Harvest Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	• Residual effects for this alternative include the potential impact of up to 70 identified Animal, Fish, and Plant Harvest Areas. <b>HIGH RESIDUAL EFFECT Least Preferred</b>	• Residual effects for this alternative include the potential impact of up to 40 identified Animal, Fish, and Plant Harvest Areas. <b>HIGH RESIDUAL EFFECT Most Preferred</b>
	• Cultural, Spiritual, and Sacred Areas (MFFN).		<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Cultural, Spiritual, and Sacred Areas.</li> <li>If direct adverse impacts are anticipated to a Cultural, Spiritual, and Sacred Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	• Residual effects for this alternative include the potential impact of up to 15 identified Cultural, Spiritual, and Sacred Areas. <b>MODERATE RESIDUAL EFFECT No discernable difference</b>	• Residual effects for this alternative include the potential impact of up to 15 identified Cultural, Spiritual, and Sacred Areas. <b>MODERATE RESIDUAL EFFECT No discernable difference</b>
	• Habitation Areas (MFFN).		<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Habitation Areas.</li> <li>If direct adverse impacts are anticipated to a Habitation Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	• Residual effects for this alternative include the potential impact of up to 10 Habitation Areas. <b>MODERATE RESIDUAL EFFECT Most Preferred</b>	• Residual effects for this alternative include the potential impact of up to 15 Habitation Areas. <b>LOW RESIDUAL EFFECT Least Preferred</b>
	• Travel (MFFN and Historical Maps)		<ul style="list-style-type: none"> <li>Where possible, avoid direct adverse impacts to Travel Areas.</li> <li>If direct adverse impacts are anticipated to a Travel Area, then complete further mitigation (i.e., Cultural Heritage Evaluation Report or Heritage Impact Assessment).</li> </ul>	• Residual effects for this alternative include the potential impact of two Historical Indigenous Trails. <b>MODERATE RESIDUAL EFFECT No discernable difference</b>	• Residual effects for this alternative include the potential impact of two Historical Indigenous Trails. <b>MODERATE RESIDUAL EFFECT No discernable difference</b>

**Summary of Cultural Heritage:**

- Overall
- **Alternative 4 is the most preferred route alternative for Segment 3 – North of the Albany from the perspective of Cultural Heritage** due to its overall lower Net Effects to cultural heritage resources.
  - There is a negligible difference between the alternatives.

- Archaeological Sites and Resources
- No discernible difference between the alternatives is present, as the alternatives retain much archaeological potential that must be mitigated prior to ground disturbance.

- Built Heritage Resources / Cultural Heritage Resources
- Based on the potential to impact identified cultural heritage resources, there is no overall preference between alternatives.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Net Effects</b>					
<ul style="list-style-type: none"> <li>The predicted net effects are evaluated as equivalent for both alternatives due to their effects on areas of raised cultural significance by local Indigenous nations, archaeological potential present, food / medicinal plant resources, Albany River as a potable water source, and disturbance of Harvest Areas. The predicted net effects have not considered all potential mitigation that may be applied. Net effect assessment is subject to change based on the implementation of additional mitigation. There is a negligible difference between the alternatives in terms of the cultural heritage VC because archaeological potential is present within much of the alternatives.</li> <li>The net effects assessment for Cultural Heritage employs its own, discipline-relevant methodology which only uses data relevant for cultural heritage purposes, and not the full data set used in this table. Any apparent discrepancies in the data are therefore methodological in origin and are confined to the cultural heritage report (a more detailed explanation is in the draft Cultural Heritage Report: Existing Conditions &amp; Preliminary Impact Assessment). To illustrate cultural heritage themes, a series of heat maps were created using the Indigenous Knowledge categories obtained from MFFN, in addition to potential Cultural Heritage Resources identified during the cultural heritage field review and a historic mapping review. The cultural heritage data set therefore differs in some areas from the data set from originally collected by Dillon. To generate the heat maps, a 5 km square grid was applied across the LSA, and colour coded to illustrate data point concentrations and areas of interest in proximity to the route alternatives for the Project. Data points were included according to the 5 km grid, not just the LSA. The heat maps depict Indigenous Knowledge data point frequency in numerical ranges of 5 (e.g., 0-5, 6-10, 11-15), with each range represented in a different colour. The cultural heritage assessment of potential impacts for each alternative was based on the maximum potential impacts as depicted on the heat maps rather than a precise account of individual data points. Neither did the cultural heritage assessment differentiate between direct or indirect impacts, but broadly screened for any potential impacts along the route alternatives. The cultural heritage impact assessment for the preferred route includes a more precise treatment of the relevant data, excluding data points outside the LSA and assessing direct versus indirect impacts within the LSA.</li> </ul>					
<b>Notes:</b>					
<ul style="list-style-type: none"> <li>For consistency, Cultural Heritage indicators have been revised from those presented in the Study Plan to be consistent with the Indigenous Knowledge data points used to develop the cultural heritage themes for the Cultural Heritage Report.</li> </ul>					
<b>Visual</b>					
Visual	Change in landscape character.	<ul style="list-style-type: none"> <li>Visibility of project from identified valued / sensitive receptor locations.</li> <li>Change in landscape character will result in the change / impact to the existing visual environment.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize disturbance to the surrounding landscape including Peatland. Vegetation. Terrain and Surface Water.</li> <li>Minimize the creation on open vistas to reduce visibility of proposed community access road.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction.</li> </ul>	<ul style="list-style-type: none"> <li>Greater number of River crossings has potential for greater visual impact.</li> </ul>	<ul style="list-style-type: none"> <li>Fewer number of River crossings has potential for less visual impact.</li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>
				<ul style="list-style-type: none"> <li>See below anticipated impacts to changes in landscape character.</li> </ul>	<ul style="list-style-type: none"> <li>See below anticipated impacts to changes in landscape character.</li> </ul>
	Proximity to and number of sensitive receptors.	<ul style="list-style-type: none"> <li>Alteration / change in or loss of culturally important sites and areas (e.g., ceremonial sites, place names, teaching sites, archaeological sites).</li> <li>Visibility of Cultural, Spiritual, and Sacred Areas (MFFN).</li> </ul>	<ul style="list-style-type: none"> <li>Avoid and / or screen sensitive sites and features.</li> <li>Minimize disturbance and proximity of road to sensitive receptors including known cultural and spiritual significant places.</li> </ul>	<ul style="list-style-type: none"> <li>Requires Indigenous Knowledge Team Input and Cultural Heritage Team Input.</li> </ul>	<ul style="list-style-type: none"> <li>Requires Indigenous Knowledge Team Input and Cultural Heritage Team Input.</li> </ul>
Degree of Visual Contrast.	Amount of visual disturbance.	Minimize disturbance and extent of infrastructure.	Requires visibility mapping / modelling.	Requires visibility mapping / modelling.	
Change in Landscape Character: Surface Water Features.	<ul style="list-style-type: none"> <li>Significant bridge crossings that will need to be installed over water crossing and alter landscape as well as visual environment.</li> <li>Number of waterbodies targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features (e.g., traditional land uses).</li> </ul>	<ul style="list-style-type: none"> <li>Minimize bridge crossings that will span greater distances as it will have the greatest amount of visual impact.</li> <li>Minimize the amount of bridge crossings needed that will be seen from potential sensitive receptors.</li> <li>Strategically locate bridge crossings within forested areas or visually screen with forest canopy.</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>cross 18 waterbodies, all of which are inferred as permanent;</li> <li>cross 12 waterbodies (10,634 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>cross 3 waterbodies (9,191 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>cross 9 waterbodies, all of which are inferred as permanent;</li> <li>intersect 12,185 m<sup>2</sup> of wetted area within the proposed corridor;</li> <li>cross 5 waterbodies (8,502 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work; and</li> <li>cross 3 waterbodies (8,302 m<sup>2</sup> of wetted area) that are targeted for crossing structure installation / maintenance and associated in-water work with potential effects to sensitive receptors or features.</li> </ul> </li> </ul>	

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
	<ul style="list-style-type: none"> <li>Change in Landscape Character: Vegetation and Ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>Area of wetland, riparian and upland ecosystems disturbed, altering the visual environment.</li> <li>Area of wetland, riparian and upland ecosystems disturbed, affecting traditional land uses.</li> <li>Visual alternation of cultural and spiritual significant places.</li> </ul>	<ul style="list-style-type: none"> <li>Minimize disturbance of existing vegetation and various ecosystems which will alter the visual environment.</li> <li>Consult with Indigenous communities of any disturbed sites and land uses that may be visually impacted by the community access road.</li> <li>Implement reclamation, revegetation and compensation practices of disturbed areas after the construction of the community access road.</li> <li>Strategically locate road within forested areas to visually mitigate views of the community access road and minimize open areas and upland areas that have greater visual impact.</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>this alternative is anticipated to disturb 1,178.96 ha of wetland and riparian ecosystems;</li> <li>this alternative is anticipated to disturb 16 upland ecosite types; and</li> <li>this alternative is anticipated to disturb 1,046.00 ha of peatland and 17 peatland ecosite types.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Anticipated net impacts to landscape character: <ul style="list-style-type: none"> <li>this alternative is anticipated to disturb 430.45 ha of wetland and riparian ecosystems;</li> <li>this alternative is anticipated to disturb 12 upland ecosite types; and</li> <li>this alternative is anticipated to disturb 433.27 ha of peatland and 10 peatland ecosite types.</li> </ul> </li> </ul>
<p><b>Summary of Visual:</b></p> <p><i>Overall</i></p> <ul style="list-style-type: none"> <li><b>Alternative 4 is the most preferred route alternative for Segment 3 – North of Albany Crossing from the perspective of Visual</b> as it is a shorter route with lower impact to surrounding sensitive receptors.</li> <li>Alternative 4 has a lower number of significant water crossing reducing visual impact.</li> <li>The landscape terrain for both Alternative 1 and 4 is similar, characterized by fen and marsh conditions. However, Alternative 1 exhibits a geological composition with a higher proportion of sand and gravel, thereby reducing the construction impact compared to wetlands and consequently resulting in a more moderately reduced visual impact.</li> <li>Alternative 1 is depicted as being in closer proximity to and intersecting with a greater number of traditional Indigenous pathways, which would have a more significant and higher impact on traditional land uses.</li> </ul> <p><i>Net Effects</i></p> <ul style="list-style-type: none"> <li>Implementation of the community access road will alter the existing landscape character, and as a result alter the visual environment. Degree of visual contrast and affected sensitive receptors will be determined with visibility mapping / modelling. Based on anticipated change in landscape character of surface water features, Alternative 1 results in the highest net effects while Alternative 4 results in the lowest net effects. Based on anticipated changes in landscape character of vegetation and ecosystems, Alternative 1 results in the highest net effects while Alternative 4 results in the lowest net effects, given the data available to date.</li> </ul>					
<b>Human Health and Community Safety</b>					
Public Safety	<ul style="list-style-type: none"> <li>Road Use Accident.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for roadway related accidents as a result of the road project including vehicles and pedestrians.</li> </ul>	<ul style="list-style-type: none"> <li>Post “no entry”, warning signs and barricades (e.g., gates, fences), where necessary, around active construction sites; warning signs and reduced speed limits to be established at known wildlife crossing locations; warning signs and lights to be displayed for road maintenance equipment and trail crossings.</li> <li>Provide for safe access for trappers and other traditional users.</li> </ul>	<ul style="list-style-type: none"> <li>The development and use of the road has the potential to result in net effects to public safety including road related accidents. All route segments are considered to have relatively equal potential for accidents.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p>	<ul style="list-style-type: none"> <li>The development and use of the road has the potential to result in net effects to public safety including road related accidents. All route segments are considered to have relatively equal potential for accidents.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
Environmental Factors Influencing Human Health and Community Safety	<ul style="list-style-type: none"> <li>Country Foods.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for change in the quality and quantity (abundance) of country foods.</li> </ul>	<ul style="list-style-type: none"> <li>Reclaim and rehabilitate areas disturbed by construction to encourage natural regeneration / regrowth of vegetation and habitat restoration.</li> <li>Community input into alignment routing, component siting and road design avoid important areas of botanical and wildlife resources that serve as country foods to the extent feasible.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road has the potential to result in net effects to the abundance of harvested species which could impact country food consumption by Indigenous communities.</li> <li>Moose is understood to be an important species that is harvested by First Nations. The PDA for this segment contains no area of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>It is unknown if Caribou is currently harvested in the LSA and therefore is not considered in this evaluation in regard to country foods.</li> <li>This alternative would result in the crossing of a greater number of watercourses requiring in-water works (16) and therefore has a greater potential for impact to fish species that may be harvested for country foods. No Indigenous Knowledge information has been provided regarding the actual uses of these watercourses for fish harvesting.</li> <li>Information on how the quality of harvested species could be affected by the road is not known at this time and will be assessed as part of the project impact assessment.</li> <li>Higher potential for net effects (due to fish habitat effects).</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road has the potential to result in net effects to the abundance of harvested species which could impact country food consumption by Indigenous communities.</li> <li>Moose is understood to be an important species that is harvested by First Nations. The PDA for this segment contains no area of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>It is unknown if Caribou is currently harvested in the LSA and therefore is not considered in this evaluation in regard to country foods.</li> <li>This alternative would result in the crossing of a lower number of watercourses requiring in-water works (7) and therefore has a lower potential for impact to fish species that may be harvested for country foods. No Indigenous Knowledge information has been provided regarding the actual uses of these watercourses for fish harvesting.</li> <li>Information on how the quality of harvested species could be affected by the road is not known at this time and will be assessed as part of the project impact assessment.</li> <li>Lower potential for net effects (due to fish habitat effects).</li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>

**Summary of Human Health and Community Safety:**

- Overall
- Alternative 4 is the most preferred route alternative for Segment 3- North of Albany from the perspective of Human Health and Community Safety.**
  - Alternative 4 results in less impact to fish habitat, and fish is an important country food source for local Indigenous communities.
  - All route segments will provide connection to the Marten Falls community and result in the same health impacts to the community including for example access to health services, changed to social and economic structures, mental well-being, etc.
  - Generally, potential effects to the human health and community safety at the local or regional scale is considered similar for all the alternative routes.
  - Only two human health and community safety indicators were considered to have relevance considering the character of the study area and data availability: road use accidents and availability of country foods.
  - All route segments are considered equal with respect to impacts on Indigenous women including human trafficking.
  - Further, there are no permanent places of residences in proximity to the route segments that could be impacted in noise and air quality changes that might result in health impacts.

- Net Effects
- Alternative 4 results in lower net effects than Alternative 1 due to impacts on fish and fish habitat. Although, to date, no Indigenous Knowledge information has been provided regarding the actual uses of these watercourses for fish harvesting. A comprehensive assessment of net effects to human health and community safety will be completed on the preferred route and may result in a different determination of predicted net effects to the VC.

**Social**

**Summary of Social:**

- Overall
- All route segments will provide connection to the Marten Falls community and provide the same expected net social impact to the community.
  - Social-community impacts from the Community Access Road are anticipated to be focused on the communities located with the LSA including MFFN, Aroland First Nation, and Greenstone.
  - The potential for social impacts (e.g., change in housing demand / supply, community well-being, etc.) is expected to be the same in all the LSA communities for all route alternatives.
  - No specific social-community features were identified in proximity to the alternative route segments that could be impacted.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<ul style="list-style-type: none"> <li>As such, both alternatives are equally preferred from a social-community perspective.</li> </ul>					
<b>Land and Resource Uses</b>					
Land Use Compatibility	<ul style="list-style-type: none"> <li>Binary alignment with established planning policy requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Description.</li> </ul>	<ul style="list-style-type: none"> <li>No applicable measures due to absence of land use designations.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative route segments do not pass through any lands with land use designations. All route segments are on crown owned lands and are subject to the same provincial policies.</li> </ul>	<ul style="list-style-type: none"> <li>The alternative route segments do not pass through any lands with land use designations. All route segments are on crown owned lands and are subject to the same provincial policies.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
Parks and Protected Areas	<ul style="list-style-type: none"> <li>Number and area of parks and protected areas impacted.</li> </ul>	<ul style="list-style-type: none"> <li>Number and area of Park and Protected area with natural, cultural or recreation values impacted</li> </ul>	<ul style="list-style-type: none"> <li>Limit clearing and use of land within parks and protected lands as much as possible. Temporary work areas such as staging areas should be located outside of parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could result in net effects including the loss of designated parkland area and disturb use of adjacent parkland.</li> <li>The alternative route segments do not pass through parks or protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could result in net effects including the loss of designated parkland area and disturb use of adjacent parkland.</li> <li>The alternative route segments do not pass through parks or protected areas.</li> </ul>
					<b>No discernable difference</b>
Parks and Protected Areas	<ul style="list-style-type: none"> <li>Accessibility to parks and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>Extent to which access to parks and protected areas is increased.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor and limit the development of any side trails / roads that might extend into parks and protected areas.</li> <li>Work with Ontario Parks regarding any measures to control access into parks and protected areas as applicable.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could have net effects that change access levels to existing parks. The net effects of this are dependent on the proximity of the road to the park and nature of the park.</li> <li>The alternative route segments do not pass through parks or protected areas. Accessibility to parks and protected areas is not affected.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could have net effects that change access levels to existing parks. The net effects of this are dependent on the proximity of the road to the park and nature of the park.</li> <li>The alternative route segments do not pass through parks or protected areas. Accessibility to parks and protected areas is not affected.</li> </ul>
					<b>No discernable difference</b>
Recreation and Tourism	<ul style="list-style-type: none"> <li>Accessibility to lands and waterways used for recreation and tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Change to access to land utilized for recreation and / or tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a land / waterbody access plan to determine need for any access restrictions and / or access enhancements to promote recreation and tourism in the area.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access levels to current remote lands and water resources that could provide new recreation and tourism opportunities.</li> <li>All segments provide greater access to lands that are currently inaccessible.</li> <li>All segments provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route segment are not considered to have more recreation value than other route segments. No information has been shared by stakeholders to suggest otherwise.</li> <li>Recreational users (e.g., snowmobilers, hikers, canoe / kayak users, etc.) would benefit from greater access to previously inaccessible lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access levels to current remote lands and water resources that could provide new recreation and tourism opportunities.</li> <li>All segments provide greater access to lands that are currently inaccessible.</li> <li>All segments provide greater access to lands that are currently inaccessible and which could be used for recreation purposes. Lands associated with this route segment are not considered to have more recreation value than other route segments. No information has been shared by stakeholders to suggest otherwise.</li> <li>Recreational users (e.g., snowmobilers, hikers, canoe / kayak users, etc.) would benefit from greater access to previously inaccessible lands.</li> </ul>
Recreation and Tourism			<ul style="list-style-type: none"> <li>Change in waterway navigability including for recreation and tourism.</li> </ul>	<ul style="list-style-type: none"> <li>Navigable waterway crossings will be designed to not inhibit navigation.</li> <li>Navigation to be maintained during construction.</li> </ul>	<ul style="list-style-type: none"> <li>The development of bridges over watercourses could negatively affect navigation.</li> <li>Route alternative to cross 18 waterbodies. Net effects to navigation are expected to be minimal.</li> </ul>
					<b>Least Preferred</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
	<ul style="list-style-type: none"> <li>Environmental Conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Change in environmental conditions that could change attractiveness of the area for tourism and recreation.</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to blasting measures in accordance with the Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (Wright and Hopky, 1998).</li> <li>Measures to avoid unnecessary vehicle and machine idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Refuelling, service, and maintenance of vehicles and equipment will generally be carried out in designated areas at temporary construction camps and temporary laydown areas a minimum of 30 m from waterbodies.</li> <li>Wash water from vehicles and equipment will not be allowed to enter a waterbody and will be conveyed to areas for infiltration, treated prior to discharge to the receiving environment, or hauled offsite.</li> <li>Minimize vegetation clearing to only what is required for construction and staging.</li> <li>Incorporate standard tree protection and ESC measures.</li> <li>Implement progressive reclamation and revegetation of disturbed areas no longer required following construction (e.g., temporary access roads, construction camps, and laydown areas).</li> <li>MFFN will develop and implement an Environmental Protection Plan, which will include best management practices for vegetation protection and mitigation.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The road development and its operation could result in disturbance net effects such as runoff that could negatively affect the quality of the adjacent environment and affect its attractiveness for recreation.</li> <li>All segments are expected to result in similar change to environmental conditions that could result in effects to lands used for recreation.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p>	<ul style="list-style-type: none"> <li>The road development and its operation could result in disturbance net effects such as runoff that could negatively affect the quality of the adjacent environment and affect its attractiveness for recreation.</li> <li>All segments are expected to result in similar change to environmental conditions that could result in effects to lands used for recreation.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
	<ul style="list-style-type: none"> <li>Availability of species harvested for recreation purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Change to target species populations harvested for recreation purposes.</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to in-water work timing windows.</li> <li>Adherence to blasting measures in accordance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998).</li> <li>Adherence to DFO's Measures to Protect Fish and Fish Habitat (DFO 2023).</li> <li>Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>Measures to avoid unnecessary idling to minimize emissions and GHGs.</li> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Measures to limit the spread and / or introduction of invasive species.</li> <li>Develop a land / waterbody access plan to determine need for any access restrictions.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could have net effects that change the abundance of species that are harvested for recreation.</li> <li>The natural science team is not able to provide an estimation regarding the extent to which the populations of species harvested might change. Change to their habitat is used as a surrogate measurement – see indicator below.</li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could have net effects that change the abundance of species that are harvested for recreation.</li> <li>The natural science team is not able to provide an estimation regarding the extent to which the populations of species harvested might change. Change to their habitat is used as a surrogate measurement – see indicator below.</li> </ul>
		<ul style="list-style-type: none"> <li>Change to the habitat for these target species.</li> </ul>	<ul style="list-style-type: none"> <li>Typical mitigation and avoidance measures such as standard practices for construction, road, and water crossing construction and maintenance will be applied to both construction and operation phases of the Project. Such measures include: <ul style="list-style-type: none"> <li>Development and implementation of a CEMP by the Contractor.</li> <li>Adherence to in-water work timing windows.</li> <li>Adherence to blasting measures in accordance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998).</li> <li>Adherence to DFO's Measures to Protect Fish and Fish Habitat (DFO 2023).</li> <li>Adherence to DFO's Interim Codes of Practice (temporary cofferdams, stream crossings, fish screens, culvert maintenance [for operations]).</li> <li>Measures to avoid unnecessary idling to minimize emissions and GHGs.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The development and operation of the road could remove habitat of key valued species and could reduce the abundance of these species for recreation harvesting.</li> <li>Moose is a key wildlife species that is recreationally hunted. The PDA for this segment contains no area of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>This route segment to cross a higher number of watercourses involving in-water works (16) and has greater potential for impact to fish habitat.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p>	<ul style="list-style-type: none"> <li>The development and operation of the road could remove habitat of key valued species and could reduce the abundance of these species for recreation harvesting.</li> <li>Moose is a key wildlife species that is recreationally hunted. The PDA for this segment contains no area of high suitability moose habitat. Impacts to this habitat could impact area moose populations.</li> <li>This route segment to cross a lower number of water crossings involving in-water works (7) and has lower potential for impact of fish habitat.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
			<ul style="list-style-type: none"> <li>Development and implementation of a Spill Management Plan and Sediment and Erosion Control Plan.</li> <li>Proper water crossing structure design and installation to accommodate flow and drainage as well as fish passage in fish habitat, where appropriate.</li> <li>Measures to limit the spread and / or introduction of invasive species.</li> <li>Develop a land / waterbody access plan to determine need for any access restrictions.</li> </ul>		
Extractive Industry	<ul style="list-style-type: none"> <li>Removal of lands with potential for mineral extraction.</li> </ul>	<ul style="list-style-type: none"> <li>Area of land under mineral claim that the road segments pass through.</li> </ul>	<ul style="list-style-type: none"> <li>Engage with land claim holders in the road design stage to determine how impacts to mineral deposits can be minimized and / or access to mineral areas enhanced.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could remove mineral resource areas from being extracted in the future.</li> <li>This segment: <ul style="list-style-type: none"> <li>has 2,154.36 ha of operational claims within the PDA; and</li> <li>has 907.05 ha of aggregate sites within the PDA.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could remove mineral resource areas from being extracted in the future.</li> <li>This segment: <ul style="list-style-type: none"> <li>has 779.48 ha of operational claims within the PDA; and</li> <li>has 366.08 ha of aggregate sites within the PDA.</li> </ul> </li> </ul>
				<b>Least Preferred</b>	<b>Most Preferred</b>
	<ul style="list-style-type: none"> <li>Proximity to and access to lands with future potential for mining development.</li> </ul>	<ul style="list-style-type: none"> <li>Change to access to lands with future potential for mineral extraction.</li> </ul>	<ul style="list-style-type: none"> <li>Engage with land claim holders in the road design stage to determine how impacts to mineral deposits can be minimized and / or access to mineral areas enhanced.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access to mineral resource areas and therefore potentially resulting in their development for economic benefit to the region and local communities.</li> <li>This route segment's alignment provides 5.22 km of access into potential future aggregate sites. Greatest change in access to lands with future potential for mineral extraction.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could improve access to mineral resource areas and therefore potentially resulting in their development for economic benefit to the region and local communities.</li> <li>This segment provides no additional access to potential future aggregate sites. Lowest change in access to lands with future potential for mineral extraction.</li> </ul>
				<b>Most Preferred</b>	<b>Least Preferred</b>
Forestry Industry	<ul style="list-style-type: none"> <li>Removal of commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>Area of commercial forestry land that the road segments pass through.</li> </ul>	<ul style="list-style-type: none"> <li>No measures because there are no impacts to commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the removal of forested lands that are commercially harvested.</li> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on removal of commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the removal of forested lands that are commercially harvested.</li> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on removal of commercial forestry lands.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
	<ul style="list-style-type: none"> <li>Proximity to and access to lands with potential for forest harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>Change to access to forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>Engage with forestry companies during road design stage regarding access to potential new forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could provide access to lands with timber that could be harvested for economic benefit to the region and local communities.</li> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on access to commercial forestry lands.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could provide access to lands with timber that could be harvested for economic benefit to the region and local communities.</li> <li>This segment impacts no area of commercial forestry land. Both route segments have no impact on access to commercial forestry lands.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
Remote Outfitters	<ul style="list-style-type: none"> <li>Change to operations of remote outfitters in vicinity of road routes.</li> </ul>	<ul style="list-style-type: none"> <li>Number and proximity of remote outfitters to the alternatives.</li> <li>Potential for impact to the outfitters from the alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>During final road alignment selection and road design phase consider proximity of remote tourism outfitters to maximize separation distance.</li> <li>Engage with tourism outfitters during road design phase.</li> <li>If applicable, provide compensation to any outfitters displaced or who can no longer operate because of the road.</li> <li>Develop a land / waterbody access plan to determine need for any access restrictions and / or access enhancements to protect remote tourism operations.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could mean that lands and waterbodies are more accessible to the public and decrease the attractiveness of the area for remote tourism operations.</li> <li>This segment provides increased access to zero remote tourism camp outfitter locations. There is no potential for impact to outfitters from this route alternative.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p>	<ul style="list-style-type: none"> <li>The development of the road could mean that lands and waterbodies are more accessible to the public and decrease the attractiveness of the area for remote tourism operations.</li> <li>This segment provides increased access to zero remote tourism camp outfitter locations. There is no potential for impact to outfitters from this route alternative.</li> </ul> <p style="text-align: center;"><b>No discernable difference</b></p>
Trapping	<ul style="list-style-type: none"> <li>Change to trapping activity in vicinity of alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>Length of route passing through trap lines / number of trap lines affected.</li> <li>Potential for change in populations of harvested furbearing species.</li> <li>Change in access to lands for trapping.</li> </ul>	<ul style="list-style-type: none"> <li>Provide community updates regarding the location and timing of Construction noise activities.</li> <li>In selection of final road alignment and road design development, where possible, avoid high-quality furbearing species habitat.</li> <li>Engage with trappers regarding need for access related mitigation and or enhancements to improve access for trappers.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road could result in the loss of furbearer habitat therefore decreasing the populations of these species for harvesting. Alternatively the road could improve access to lands that trappers could take advantage of.</li> <li>This segment: <ul style="list-style-type: none"> <li>has a length of 67.69 km passing through trapline areas;</li> <li>intersects 5 traplines; and</li> <li>has a total of 2,426.60 ha of trapline area land within the PDA.</li> </ul> </li> <li>Would result in the greatest impact on American marten and wolverine habitat.</li> <li>All route segments provide increased access to trapline areas.</li> <li>Route passes through the greatest amount of trap line area and passes through the highest amount of important furbearer habitat and is therefore ranked least preferred.</li> </ul> <p style="text-align: center;"><b>Least Preferred</b></p>	<ul style="list-style-type: none"> <li>The development of the road could result in the loss of furbearer habitat therefore decreasing the populations of these species for harvesting. Alternatively the road could improve access to lands that trappers could take advantage of.</li> <li>This segment: <ul style="list-style-type: none"> <li>has a length of 34.0 km passing through trapline areas;</li> <li>intersects 4 traplines; and</li> <li>has a total of 824.99 ha of trapline area land within the PDA.</li> </ul> </li> <li>Would result in the lowest impact on American marten and wolverine habitat.</li> <li>All route segments provide increased access to trapline areas.</li> <li>Route passes through the lowest amount of trap line area and passes through the least amount of important furbearer habitat and is therefore ranked preferred.</li> </ul> <p style="text-align: center;"><b>Most Preferred</b></p>

**Summary of Land and Resource Use:**

Overall

- Alternative 4 is the slightly preferred route alternative for Segment 3 – North of Albany Crossing from the perspective of Land and Resource Use** due to less potential impact on fishing (from fewer water crossings and fish habitat impacts), less potential for impact on navigation, less potential for direct effects on mineral / aggregate resources, and less potential for impact to trapping activity.

Net Effects

- The predicted net effects from both alternatives are equivalent with regard to land use compatibility.
- Neither alternative intersects with any parks nor protected areas.
- Both alternatives would have similar impact with regard to recreation and tourism as both route alternatives would provide increased access to areas that are inaccessible and remote.
- Alternative 1 slightly preferred with regard to extractive industries as it would provide greater access to lands with potential for future mineral extraction activities.
- There is no intersect of either alternative with forestry activity.
- There are no remote tourism operators in the vicinity of either alternative.
- Trappers would be least affected by Alternative 4 as it and affects the lowest area of high value furbearer habitat.

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>People</b>					
<b>Climate Adaptation and Resiliency</b>					
<b>Summary of Climate Adaptation and Resiliency:</b>					
<u>Overall</u>					
<ul style="list-style-type: none"> <li>As outlined in the Climate Overview Report, there exists significant data gaps and uncertainty in the generation of climate projections that have the appropriate level of granularity to differentiate between alternative routes.</li> <li>As such, currently, there is no discernible difference for the alternatives from a Climate Adaptation and Resiliency perspective.</li> </ul>					
<b>Economic</b>					
Regional Economy	<ul style="list-style-type: none"> <li>Traditional Economies.</li> </ul>	<ul style="list-style-type: none"> <li>Change in Ability to Undertake Traditional Economic Activities.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate information on planned and active construction activities to facilitate local planning of traditional economies such as trapping.</li> <li>In selection of final road alignment as part of road design development, where possible, avoid high-quality furbearer habitat.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road has the potential to result in net effects to traditional economies such as trapping.</li> <li>Trapping is the only identified traditional economic activity that may be occurring in the study area. Trapping activity has declined significantly throughout Canada due to low fur prices. Anecdotal input suggests that trapping activity in the LSA has also declined and is no longer an important economic activity.</li> <li>The development of the road may support trapping activity through providing better access to lands used for trapping or result in negative impacts by loss of habitat for targeted species. Despite trappers being requested for information, at this time, we have no input from the trappers on the level of activity in the intersected traplines or their opinions regarding potential impact from this route segment or road development in general.</li> <li>See Trapping indicator under Land and Resource Use for ranking of routes in regard to trapline area covered and furbearer habitat impacted.</li> <li>It is also possible that some fishing occurs in local rivers for commercial purposes but we have no specific information to support this.</li> </ul>	<ul style="list-style-type: none"> <li>The development of the road has the potential to result in net effects to traditional economies such as trapping.</li> <li>Trapping is the only identified traditional economic activity that may be occurring in the study area. Trapping activity has declined significantly throughout Canada due to low fur prices. Anecdotal input suggests that trapping activity in the LSA has also declined and is no longer an important economic activity.</li> <li>The development of the road may support trapping activity through providing better access to lands used for trapping or result in negative impacts by loss of habitat for targeted species. Despite trappers being requested for information, at this time, we have no input from the trappers on the level of activity in the intersected traplines or their opinions regarding potential impact from this route segment or road development in general.</li> <li>See Trapping indicator under Land and Resource Use for ranking of routes in regard to trapline area covered and furbearer habitat impacted.</li> <li>It is also possible that some fishing occurs in local rivers for commercial purposes but we have no specific information to support this.</li> </ul>
				<b>No discernable difference</b>	<b>No discernable difference</b>
<b>Summary of Economic:</b>					
<u>Overall</u>					
<ul style="list-style-type: none"> <li><b>There is no preferred alternative for Segment 3 – North of Albany Crossing from the perspective of Economic.</b></li> <li>There is a negligible difference between the two route alternatives.</li> <li>All route segments will provide connection to the Marten Falls community and provide the same expected economic benefit to the community including, for example, a decrease in the price of goods.</li> <li>Similarly, all route segments are expected to provide similar employment opportunities and would have similar impact on government expenditure and taxation.</li> <li>There are no specific economic features (e.g., businesses) identified in the PDA of the alternative route segments.</li> <li>The opportunities for economic development including resource extraction activities such as mining are also identified to be similar amongst the alternative routes (see Land and Resource Use) and mineral claim holders indicated that all route options provide them greater access to their site of future potential for extraction and that all routes would benefit their economic potential.</li> <li>As no information from trappers is available regarding the level of trapping activity along the route segments, the routes are identified to be similar with respect to impact on traditional economies.</li> </ul>					
<u>Net Effects</u>					
<ul style="list-style-type: none"> <li>The predicted net effects from both alternatives are equivalent due to their similar predicted decrease in price of goods, employment opportunities, government expenditures, and opportunities for economic development.</li> </ul>					

Factor	Indicator	Measures	Avoidance / Mitigation / Compensation / Enhance Measures	Alternative 1	Alternative 4
<b>Technical, Engineering, and Costs</b>					
Design	Roadway Alignment Length	• km		• 67.69	• 34.17
	Number of Water Crossings	• Number		• 8	• 5
	Length of Water Crossings	• m		• 425 m (total)	• 467 m (total)
Construction Complexity	Access to Roadway Material	• Description		• Most preferred	• Least preferred
	Constructability of Roadway	• High to Low		• Most preferred	• Least preferred
	Constructability of Water Crossing	• High to Low		• Most preferred	• Least preferred
Miscellaneous	Schedule Implications	• Description		• Medium impact due to longer road to construct and more water crossings than Alternative 4 but with good access to aggregate sources.	• High impact due to longer road to construct and less water crossings than Alt 1 but less access to aggregate resources and longer haul distances.
Operations	Long Term Maintenance	• Description		• Most preferred due to access to aggregate and good substrate.	• Least preferred due to longer haul, less access to aggregate and poorer substrates.
Cost	Value of construction	• \$ CAD		• Bridges: \$ [REDACTED] • Roads: \$ [REDACTED] • Total: \$ [REDACTED]	• Bridges: \$ [REDACTED] • Roads: \$ [REDACTED] • Total: \$ [REDACTED]

**Summary of Technical, Engineering, and Cost:**

- Overall
- **Alternative 1 is the most preferred route alternative for Segment 3 – North of the Albany Crossing from the perspective of Technical, Engineering, and Cost.**
  - Alternative 4 is the least preferred.
  - Cost estimates are based on 2023 unit prices developed through discussions with northern Contractors and best practices.
  - Value of Construction includes a 20% contingency factor and climate change impacts that are assumed to be 35% to 40% of the structures' base prices.
  - Alternative 4 includes costs to construct the N/S west segment that is part of the NRL.

## Acronyms

Acronym	Definition
ATV	All-Terrain Vehicle
CEMP	Construction Environmental Management Plan
DFO	Fisheries and Oceans Canada
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
GHD	General Habitat Description
GHG	Greenhouse Gas
KDE	Kernel Density Estimation
LSA	Local Study Area
MFFN	Marten Falls First Nation
MNR	Ministry of Natural Resources
NHIC	Natural Heritage Information Centre
PDA	Project Development Area
POR	Points of reception
RSA	Regional Study Area
SAR	Species at Risk
SARA	Species at Risk Act
SCC	Species of Conservation Concern
VC	Valued Component

## References

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- Fisheries and Oceans Canada (DFO). 2023. Measures to Protect Fish and Fish Habitat. July 2023. Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>
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