



CANADA NICKEL
COMPANY



Stantec

Crawford Nickel Project Impact Statement

Chapter 24 Summary of Residual Effects



Prepared for:
Canada Nickel Company

November 22, 2024

Prepared by:
Stantec Consulting Ltd.

Table of Contents

24	Summary of Residual Effects	24.1
24.1	Summary of Changes to the Environment, Mitigation, and Residual Effects	24.1
24.2	Summary of Significance of Adverse Federal Effects.....	24.13

List of Tables

Table 24.1	Summary of Project Residual Effects	24.2
Table 24.2	Summary of Significance of Effects Within Federal Jurisdiction	24.14

Acronyms and Abbreviations

CWQG-FAL	Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Long Term
DFO	Department of Fisheries and Oceans
LSA	Local Study Area
MDMER	Metal and Diamond Mining Effluent Regulations
MECP	Ministry of the Environment, Conservation and Parks
PA	Project Area
RSA	Regional Study Area
SAR	Species at Risk
SARA	Species at Risk Act
SOCC	Species of Conservation Concern
TMF	Tailings Management Facility
VC	Valued Component

24 Summary of Residual Effects

This chapter provides a summary of the predicted residual effects of the Project and key mitigation measures proposed to avoid, reduce, restore, or compensate for predicted effects. The characterization of residual effects, as taken from Chapters 10 through 23, as well as a summary of the extent of significance for adverse federal effects are also provided.

24.1 Summary of Changes to the Environment, Mitigation, and Residual Effects

Chapters 10 through 23 provide an assessment of Project-related effects on Valued Components (VCs). In addition to the scope of the assessment and a description of summary of baseline conditions, the VC assessments include:

- a description of the interactions between each Project activity and the VC
- a description of pathways of effects, or potential effects of the Project, on each VC
- the identification of mitigation measures to be implemented to avoid, reduce, restore, or compensate for potential environmental effects
- a description and characterization of residual effects (i.e., effects remaining after mitigation)
- where appropriate, the extent of significance of any adverse federal effects (i.e., adverse effects within federal jurisdiction and any direct or incidental effects)

Table 24.1 presents a summary of the key mitigation measures and residual effects for each VC based on the results of Chapters 10 through 23. The table also summarizes the characterization of residual effects by identifying the direction, magnitude, geographic extent, timing, duration, frequency, and reversibility conclusions of each VC. A summary of residual effects for Chapters 25 through 28 can be found within each of those chapters.

Table 24.1 Summary of Project Residual Effects

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Geology and Geologic Hazards									
Change in terrain stability	C, O	A	L	PA	NS	ST	IR	R	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan Mitigate through design of the Open Pit, TMF, Impoundment Facility, stockpiles, including following applicable guidelines Conduct a slope stability assessment at closure to demonstrate the long-term physical stability of the Open Pit and the Impoundment Facility
	<ul style="list-style-type: none"> Changes in terrain are predominantly attributed to ground disturbance and the construction and operations of the Open Pit and Impoundment Facility There are no known geological hazards in the area and through proper design potential slope failure of Project components (e.g. Open Pit, stockpiles) can be mitigated 								
Soil									
Change in soil quality	C, O	A	L-M	PA	MS	MT	IR	R	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan, a Spill Prevention and Contingency Plan, and a Soils Management and Rehabilitation Plan Salvage soil for reuse during rehabilitation Limit Project footprint impacts Implement dust control
	D	A	L	PA	MS	MT	IR	R	
Change to soil quantity	C, O, D	A	M	PA	MS	MT	S	I	
	<ul style="list-style-type: none"> Soil erosion, compaction, admixing, and contamination are predicted to affect soil quality Soil quantity can be impacted by changes in soil depths, but by salvaging soil and managing it throughout the life of the Project, potential adverse effects on soil will be reduced and suitable reclamation soils can be sourced from the site 								
Atmospheric Environment									
Change to ambient air quality	O	A	H	LSA	NS	MT	IR	R	<ul style="list-style-type: none"> Develop and implement an Air Quality Management Plan Impose restrictions within the Modelled Mine Boundary around the Project Area and at receptors R01 and R05 (e.g., install signage and/or gates on trails to restrict access, agreements to prevent overnight stays, property acquisition, etc.) Implement design measures to reduce dust, including enclosure of and installing dust collectors on primary and secondary crushers, and installing a trolley-assist system on pit ramps to reduce diesel emissions Implement dust suppression on Project roads Implement measures to reduce vehicles emissions (idling policy, Tier 4 emissions standards, where feasible) and equipment emissions Design exterior lighting systems to limit light trespass and to avoid glare (i.e., lighting that targets specific areas, cut-off specifications)
Change to ambient lighting	O	A	L	LSA	NS	MT	C	R	
	<ul style="list-style-type: none"> Predicted 24-hour average ground level concentrations for Suspended Particulate Matter (SPM), particulate matter less than 10 microns (PM₁₀), aluminum and muscovite may be above their applicable thresholds (i.e., ambient air quality criteria or Ministry of the Environment, Conservation and Parks' screening levels) during Project construction and operations. However, predicted SPM and PM₁₀ exceedances will occur infrequently within the Local Study Area (LSA) and this effect would be reversible Dispersion modelling predicted that nitrogen dioxide (NO₂) may be above the Canadian Ambient Air Quality Standards It is noted that the application of additional mitigations during the detailed design and through the Provincial permitting process could further reduce emissions and that the assessment was undertaken using conservative assumptions Levels of light trespass and glare are not expected to exceed International Commission of Illumination guidelines at receptor locations 								

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Acoustic Environment									
Change in noise levels related to PA construction, operations, and decommissioning activity, including blasting	C, O, D	A	M	LSA	NS	ST, MT	R, C	R	<ul style="list-style-type: none"> Develop and implement a Noise and Vibration Management Plan that includes a complaint reporting protocol and a procedure for verifying and addressing complaints Impose restrictions within the Modelled Mine Boundary around the Project Area and at receptors R01 and R05 (e.g., install signage and/or gates on trails to restrict access, agreements to prevent overnight stays, property acquisition, etc.) Locating large stationary machinery (e.g., crushers) inside buildings and locating primary crushers below grade Implement measures to reduce vehicles and equipment emissions (idling policy)
Change in noise levels related to Highway 655 realignment construction	C	A	L, M	LSA	NS	MT	C	R	
Change in noise levels related to realigned Highway 655 traffic	O, D	A	L, M	LSA	NS	LT	C	I	
Change in noise levels related to rail spur line traffic away from the PA	C, O, D	A	M	LSA	NS	LT	C	R	
Change in ground vibration levels related to PA construction, operations, and decommissioning activity	C, O, D	A	L	LSA	NS	ST, MT	C	R	
Change in ground vibration levels related to blasting	C, O, D	A	M	LSA	NS	ST, MT	R	R	
	<ul style="list-style-type: none"> Project activities, including blasting, are predicted to increase noise levels but will be within federal and provincial criteria at receptors Construction and operations activities, including blasting, are predicted to increase vibrations levels but will be within applicable federal and provincial criteria at receptors 								
Groundwater									
Change in groundwater quantity related to construction	C	A	M	PA	NS	ST	IR	R	<ul style="list-style-type: none"> Limit Project footprint to reduce potential reductions in groundwater recharge and the number of subwatersheds overprinted by the Project Area (PA) Limit seepage and apply best management practices to reduce contact water infiltration If faults or fractures are encountered, implement adaptive management measures if there is an increased flow of groundwater into the Open Pit, if necessary Install contact water collection ditches around the Stockpiles, Impoundment Facility, and Tailings Management Facility to collect toe seepage and groundwater recharge from these Project components. Develop and implement Emergency Preparedness and Response Plan, Spill Prevention and Contingency Plan, and Metal Leaching and Acid Rock Drainage Plan Conduct progressive rehabilitation (placement of a vegetated soil cover) to reduce infiltration
Change in groundwater quantity related to Open Pit	C	A	H to L	LSA/RSA	NS	LT	C	I	
	O	A	H	LSA/RSA	NS	LT	C	I	
	D	P	H to L	LSA/RSA	NS	LT	C	I	
Change in groundwater quantity related to Tailings Management Facility	O	P	H	LSA/RSA	NS	MT	C	R	
Change in Groundwater quality	C	A	L	PA	NS	ST	IR	R	
	O	A	M to H	LSA/RSA	NS	LT	C	I	
	D	A	M to H	LSA/RSA	NS	LT	C	I	
	<ul style="list-style-type: none"> Project activities, specifically dewatering and the management of contact water, will result in measurable changes in groundwater levels Groundwater levels will gradually rise during passive closure as the Open Pit fills No groundwater users are known to exist within the areas affected by groundwater drawdown or mounding from the Project, so impacts on groundwater users are not anticipated 								

Residual Effect	Residual Effects Characterization								Key Mitigation Measures	
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility		
	<ul style="list-style-type: none"> Residual effects of the Project on groundwater quality may result in measurable changes in concentrations of parameters in groundwater and groundwater that discharges to surface water features Seepage from Project infrastructure that is not collected in perimeter ditches, and spills that may occur within the footprint of the mine, may also affect groundwater quality; however, these effects are anticipated to be limited given the travel time (approximately 275 years) for ground water to reach the nearest supply well 									
Surface Water										
Change in surface water quantity	C	A	M	LSA	NS	MT	IR	R	<ul style="list-style-type: none"> Limit Project footprint to the extent possible to limit the number of subwatersheds overprinted by the PA Develop and implement a Site-Wide Water Management Plan, including water management system designed to manage the 100-year return period, 24-hour duration storm event through the use of collection ditches, collection ponds and the Open Pit Water discharges to the North Driftwood River and West Buskegau River will be balanced to the extent feasible to maintain watercourse flows Develop a Metal Leaching and Acid Rock Drainage Plan to reduce and limit the known and potential risks of metal leaching and acid rock drainage associated with the Project, thereby reducing potential effects to water quality Develop an Erosion and Sediment Control Plan, including routine monitoring / inspection protocols, vegetation controls and/or stabilization measures to be employed in erosion-susceptible zones, such as in drainage ditching, pond inlets, outlets, and spillways Recycle contact water for use on-site (e.g., dust suppression, makeup water in the Process Plant), where practical Treat water prior to discharge, as required, to meet regulatory criteria, including an Environmental Compliance Approval issued by the Ministry of the Environment, Conservation and Parks, criteria developed through the receiving watercourse Assimilative Capacity Study (Appendix G of the Surface Water Resources Assessment [Appendix C.5 of the Impact Statement]), and the Metal and Diamond Mining Effluent Regulations (MDMER) Use proven treatment processes to meet regulatory effluent criteria prior to discharge to the environment 	
	O	A	M	LSA	NS	MT	IR	R		
	D	N	L	LSA	NS	LT	C	R		
Change in surface water quality	C	A	L	LSA	NS	MT	IR	R		
	O	A	M	LSA	NS	MT	IR	R		
	D	N	L	LSA	NS	LT	C	R		
	<ul style="list-style-type: none"> Project activities, predominantly as a result of water management and Open Pit dewatering, are predicted result in changes in flow. Changes in flow were assessed against a 10% change threshold at the downstream extent of the hydrologic model, as follows: <ul style="list-style-type: none"> no flow reductions or exceedances were predicted beyond the 10% threshold for the Jocko Creek or the West Buskegau watersheds no days with increases to flow in exceedance of 10% were predicted for the North Driftwood watershed there were 20 days during the operations phase with predicted flow reductions greater than the 10% in the North Driftwood watershed; however, further analysis concluded that the predicated flow changes would not affect ecosystem health Water levels within Mel Lake, Sutherland Lake, Jack Lake, Gerry Lake, and Martin Lake are predicted to remain within natural variability (e.g., 0.02 and 0.05 m) Project activities are predicted to result in measurable changes to surface water quality parameters; however, effluent will comply with regulatory requirement limits/guidelines at the final discharge points Local water quality immediately downstream of some final discharge points (within the mixing zones) will experience increases of parameters above baseline levels and the Provincial Water Quality Objectives and/or the Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life; however, these changes are expected to be contained within the boundaries of the Local Study Area and to be dissipated at the edge of the mixing zone 									

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Vegetation, Riparian, and Wetland Environments									
Changes in vegetation communities and species diversity	C, O, D	A	L	PA/LSA	NS	LT	IR	R	<ul style="list-style-type: none"> Limit Project footprint Limit vegetation clearing to the PA and mark clearing boundaries and limits of environmentally sensitive areas, where practical Prior to disturbance, provide Indigenous nations some time to harvest plant species of interest from within the PA, if requested Implement dust suppression measures to reduce the generation and deposition of dust on vegetation adjacent to Project activities Undertake invasive species management, including clean equipment protocol and vegetation control to eliminate the occurrence and prevent further spread Implement progressive rehabilitation using native species, plant species at risk (SAR) and species of conservation concern, and species of Indigenous importance, where practical Incorporate rare vegetation communities and wetlands into reclamation planning, where practical Incorporate revegetation strategies in the Mine Development Closure Plan, including vegetation test plot studies, revegetation and monitoring Maintain hydraulic conductivity when crossing watercourses or wetlands by using appropriately sized culverts/crossings to reduce impacts Develop and implement an Erosion and Sediment Control Plan to reduce site erosion and protect nearby riparian and wetland communities from sedimentation Develop and implement a Construction Environmental Protection Plan to reduce effects on vegetation
Changes in riparian form and function	C, O, D	A	L	PA/LSA	NS	ST/LT	S/C	R/I	
Changes in wetland form and function	C, O, D	A	M	PA/LSA	NS	ST/LT	S/C	R/I	
	<ul style="list-style-type: none"> The Project will result in direct loss of vegetation through the clearing of the PA, including approximately 11,504 hectares of natural vegetation No plant species at risk (SAR) or species of conservation concern (SOCC) are documented within the PA Approximately 3 ha of hardwood swamps (ecosite B133), that has the potential to support rare vegetation communities, will be removed from the PA While site preparation and clearing will result in the direct loss of plant species of importance to Indigenous nations, no change in plant species richness in the LSA is expected since these species are common and widely distributed in the Ecoregion Edge effects such as changes in wind, light, hydrology are also anticipated because of vegetation clearing. These effects will differ from species to species, (e.g. shade intolerant plants will increase in abundance while species requiring shade will decrease in abundance). Site preparation and clearing will result in a loss of approximately 178 ha or 32% of the naturally vegetated riparian habitat within the LSA and the loss of approximately 8,667 ha or 22% of wetland habitat within the LSA Dewatering activities are predicted to lower the water table outside the north and east side of the PA, potentially affecting wetlands and riparian habitat, creating relatively drier conditions that may impact species composition, diversity, and plant health Project activities, primarily associated with the mobilization of equipment to site, has the potential to introduce invasive species Progressive reclamation over the life of the Project and the rehabilitation of the site through closure planning will re-introduce vegetation to PA 								

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Fish and Fish Habitat									
Change in fish habitat	C, O, D	A	M	LSA	MS	LT	C	I	<ul style="list-style-type: none"> Obtain a <i>Fisheries Act</i> Authorization, including the development and implementation of fisheries offsetting plan to compensate for unavoidable loss of fish habitat (see Appendix M of the Impact Statement) Using natural channel design principles to design and construct the North Driftwood River Diversion Channel to divert flows in the North Driftwood River watershed around the PA and to reduce potential flow reductions in the North Driftwood River downstream of the PA Limit the Project footprint, including reducing Project footprint in the West Buskegau River and Jocko Creek watersheds, to the extent possible, and not locating infrastructure in the West Buskegau River mainstem to the east and the headwater lakes of the North Driftwood River watershed (i.e., Martin, Gerry, Jack, Mel, Sutherland, Davis lakes) to the west of the PA Constructing mine infrastructure in a progressive manner to delay alteration of fish habitat Conduct any in-water construction activities outside of the restricted activity periods Isolate work areas when conducting in-water activities, and conduct fish salvages by a qualified person prior to dewatering Progressively construct and reclaim mine infrastructure Design culverts to maintain fish passage and maintain fish habitat values (i.e., open bottom structures) Maintain downstream flows when conducting in-water works Fitting all intakes with screens that comply with the DFO's end-of-pipe fish screen requirements to prevent impingement or entrainment of fish Implementing a no-fishing policy in watercourses and waterbodies within or adjacent to the PA by all Project personnel while on-shift Develop and implement an Erosion and Sediment Control Plan, an Explosives Management Plan, an Invasive Species Management Plan, a Waste Management Plan, a Spill Prevention and Contingency Plan, Fish Salvage Plan, a Site-Wide Water Management Plan, and a Construction Environmental Protection Plan
Change in fish health, growth, or survival	C, O, D	A	M	LSA	MS	LT	C	R	
	<ul style="list-style-type: none"> The Project will result in the direct loss of fish habitat in the North Driftwood River, as well as tributaries of the North Driftwood River, West Buskegau River within the PA, totalling approximately 147.31 ha of mainstem, headwater ponds, and headwater tributaries of these watersheds No effects on lake sturgeon are predicted as a result of Project changes that avoid discharges to the Mattagami River, where this species is known to occur The Project is predicted to change flows, which has the potential to affect riffle habitat more so during low-flow periods and not during the spring freshet when most fish species in the North Driftwood River and West Buskegau River spawn Increases in total suspended solids (TSS) are anticipated due to sediment releases to waterbodies and watercourses from Project activities (i.e., water management infrastructure, water crossings, and site preparation (grading, clearing)). Once constructed, the water management system will allow for clean, non-contact water to be directed around the Project through diversion channels. Surface water runoff that comes into contact with disturbed areas will be managed/treated to meet applicable criteria prior to being released to the surrounding environment Effects on the health, growth, or survival of fish and other aquatic biota, such as plankton and benthic invertebrates and their contributions to primary and secondary productivity are not expected due to predicted changes in water quality during operations and closure and decommissioning phases <ul style="list-style-type: none"> Parameters of Potential Concern for water quality are predicted to be below the Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Long Term (CWQG-FAL) guideline during operations with the exception of nitrite, nitrate, and copper; however, these parameters will meet the CWQG-FAL downstream of the PA and within the LSA, and no exceedances are predicted during closure and decommissioning Water temperatures of the effluent are not expected to alter water temperatures in the receivers (i.e., North Driftwood River, West Buskegau River) Residual effects on the health, growth, or survival of white suckers and forage fish due to blasting in the Open Pit are not expected to occur during construction or operation phases of the Project based on the distances between the upper bench of the Open Pit to the West Buskegau River, Martin Lake, Gerry Lake, and the North Driftwood River Diversion Channel Predicted changes in flow and water quality are not expected to impact benthic invertebrates, however, loss of fish habitat in the headwaters of the North Driftwood River and West Buskegau River watersheds will reduce the total benthic invertebrate community biomass in these two watersheds, which over time will likely reduce the amount of benthic invertebrate drift available for fish downstream of the PA 								
Birds and Bird Habitat									
Change in bird habitat	C	A	L-M	LSA	NS/HS	ST/LT	C	R/I	<ul style="list-style-type: none"> Limit Project footprint Limit vegetation clearing to the PA and mark clearing boundaries and limits of environmentally sensitive areas, where practical Implement appropriate vegetation clearing techniques to reduce impacts on features to be retained Avoid vegetation clearing and site preparation activities during restricted activity periods (i.e., core breeding period for migratory birds); if small scale, localized vegetation clearing is required during the migratory bird breeding season and the area can be effectively searched for presence of nests, experienced biologist/scientist will survey for signs of nesting before vegetation removal. Complete pre-disturbance surveys to locate raptor nests and nests of species protected on Schedule 1 of the Migratory Bird Regulations (Pileated Woodpecker, Great Blue Heron), and implement appropriate setbacks and timing windows for active raptor nests, as required
	O	A	L	LSA	NS/HS	MT/LT	C	R	
	D	P	L	LSA	NS/HS	ST/LT	C	R	
Change in mortality risk	C, O	A	L	LSA	NS/HS	MT	IR	R	
	D	A	L	LSA	NS/HS	ST	IR	R	
	<ul style="list-style-type: none"> The Project will result in the direct loss of bird habitat through vegetation removal, grading, and dewatering activities resulting in the direct loss of 11,785 ha of bird habitat, a 22% decrease in habitat from existing conditions in the LSA. This includes the loss of upland (2,837 ha), wetland (8,667 ha), and aquatic bird habitats (26 ha) The direct loss of bird habitat will represent a 40% loss of candidate waterfowl nesting features, 20% loss of candidate woodland raptor nesting, 25% loss of Sharp-tailed Grouse lekking, 46% loss of shrub/early successional breeding bird habitat, and a 30% loss of candidate marsh breeding bird habitat in the LSA Project activities will cause sensory disturbance and effects resulting in an indirect effect to bird habitat during construction and operations 								

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
	<ul style="list-style-type: none"> Site preparation activities and increased bird human interactions (e.g., bird and vehicle strikes) are predicted to increase the risk of bird mortality. Edge effects are also anticipated due to the effects of vegetation clearing, which will differ from species to species (e.g., species that prefer edge habitat will increase in abundance while habitat interior specialists may decrease in abundance) Indirect changes in habitat are predicted to affect the diversity and abundance of the bird community; however, the amount of habitat remaining in the Regional Study Area (RSA) for various bird species range from 94 to 99% as anthropogenic disturbance is low within the RSA and large tracts of habitat will remain intact Progressive reclamation and closure rehabilitation will be initiated once practical. Habitat for species that use open, early successional habitats will re-establish relatively quickly whereas habitats such as mature forest will be slower to recover. Habitat for species that use aquatic habitats (e.g., waterfowl, waterbirds) will increase during decommissioning and closure relative to baseline conditions While there will be a direct loss of species at risk (SAR) and species of conservation concern (SOCC) habitat within the PA and indirect loss in the LSA, it is predicted that species distribution will shift to undisturbed areas of the LSA where suitable habitat is available, and diversity and abundance of SAR will remain stable. Specifically: <ul style="list-style-type: none"> Bank Swallow: no predicted changes to the abundance and density of populations within the LSA as no suitable habitat was confirmed within the PA, the species is tolerant of disturbance and often nest in human-made environments Barn Swallow: no direct loss of breeding habitat because no anthropogenic structures will be impacted by the Project and this species is often present in disturbed areas (e.g., adjacent to roads) Canada Warbler: direct loss of 10,085 ha of habitat that could support this species, including 2,251 ha of forested habitat, 420 ha of treed bog/fen, and 7,414 ha of swamp habitat. Changes in abundance and distribution of Canada Warblers in the LSA is not expected during construction because sufficient habitat is expected to be available in the RSA. An estimated 308,372 ha will be available (97% of habitat will remain within the RSA) to support the Canada Warbler population post-construction. Encouraging the restoration of a high shrub layer during closure will help create Canada Warbler habitat Eastern Whip-poor-will: species was not recorded during targeted field surveys but may be present in the LSA at low densities; no predicted changes to the abundance of the Eastern Whip-poor-will population within the LSA Lesser Yellowlegs: direct loss of 3,899 ha of potential habitat, specifically bogs, fens and marshes; present in small numbers within the LSA, with no concentrations of migrants observed; an estimated 43,686 ha will be available (96% of habitat will remain) to support the Lesser yellowlegs within the RSA; indirect loss of habitat due to sensory disturbance may be experienced by Lesser Yellowlegs in areas where breeding habitat is located close to the PA Short-eared Owl: direct loss of approximately 3,147 ha of bog and fen habitat and 752 ha of marsh habitat; an estimated 9,900 ha of Short-eared Owl habitat will be available within the LSA and 47,086 ha available within the RSA (97% of habitat will remain) to support Short-eared Owl; no predicted changes to the abundance of the Short-eared owl population within the LSA Landbird SOCC (Evening Grosbeak, Olive-sided Flycatcher and Rusty Blackbird): direct loss of 2,521 ha of potential Evening Grosbeak habitat, 8,070 ha of potential Olive-sided Flycatcher habitat and 8,070 ha of potential habitat for Rusty Blackbird is anticipated; abundance of these species in the LSA is expected to remain stable Common Nighthawk: direct loss of habitat from construction of the Project, including 2,837 ha of forested habitat, 3,147 ha of bog and fen, and 23 ha of bedrock; suitable habitat for Common Nighthawk is readily available outside of the PA within the LSA and RSA (Figure 18.4.9) and therefore, changes to abundance are not predicted Yellow Rail: present within the LSA, it is at very low densities (only one unconfirmed call during field surveys); core of this species' range in Ontario is in the Hudson's Bay lowlands; direct loss of 752 ha of marsh habitat, although this is conservative as not all marsh habitat is suitable as this species prefers marshes dominated by sedges, grasses, and rushes with little standing water The risk of mortality will be low for adult birds because they are able to move away from construction activities 								<ul style="list-style-type: none"> Do not disturb or remove nests of provincially protected species (e.g., Bald Eagle, Osprey) unless a permit has been issued through the Fish and Wildlife Conservation Act Avoid disturbance of active migratory bird nests Prohibit hunting and harvesting by Project personnel while performing work on the Project Provide environmental personnel responsible for site monitoring during construction with training to recognize SAR and SOCC that may be present in the PA Maintain hydraulic conductivity when crossing watercourses or wetlands by using appropriately sized culverts/ crossings to reduce impacts Implement design measures to discourage bank swallows from nesting in stockpiles (i.e., flatter slopes, knock down vertical face of stockpiles) Implement progressive rehabilitation and the Mine Development Closure Plan Deploy bird deterrents (e.g., noise makers, wire barricades) around key Project infrastructure (e.g., ponds, TMF) Maintain embankments of the TMF and Collection Ponds to be free of trees and shrubs to limit the attraction of waterfowl and/or wildlife to these ponds for foraging or breeding Implement road safety measures and track and report bird mortality, including bird-vehicle collisions or collisions with equipment or project infrastructure. Develop and implement an Erosion and Sediment Control Plan and a Construction Environmental Protection Plan
Wildlife and Wildlife Habitat									
Change in habitat	C	A	L/H	PA/LSA	HS	MT/LT	C	R	<ul style="list-style-type: none"> Limit the Project footprint Limit vegetation clearing to the PA and mark clearing boundaries and limits of environmentally sensitive areas, where practical Avoid vegetation clearing during restricted activity periods (i.e., sensitive time periods for turtle overwintering, bat roosting)
	O	A	L	PA/LSA	HS	MT/LT	IR/C	R	
	D	P	L	PA/LSA	HS	ST	C	R	
Change in movement	C	A	N/L/M	PA/LSA/RSA	HS	LT	C	R	

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
	O	A	N/L	PA/LSA/RSA	HS	LT	C	R	<ul style="list-style-type: none"> Progressive rehabilitation and implementation of the Mine Development Closure Plan Maintain vegetated buffers from sensitive features and retain natural vegetation, where possible Maintain hydraulic conductivity when crossing watercourses or wetlands by using appropriately sized culverts/ crossings to reduce impacts Maintain vegetation cover along the boundaries of high activity areas (e.g., access roads) to reduce sensory effects such as noise and visual disturbances, where practical Deploy wildlife deterrents and limit vegetation growth around key Project infrastructure, such as TMF and collection ponds, until reclamation activities are underway Implement road safety measures, including wildlife friendly design principles such as signage or speed limits Implement mitigation for lighting effects, including directing lights away from wildlife habitat areas Complete pre-disturbance surveys for targeted wildlife species and/or sensitive habitats, as required Record wildlife vehicle-collisions, near misses and observations Develop and implement training for personnel related to wildlife interactions, identification and operational procedures related to wildlife If wildlife are encountered, temporarily suspend activities until the species is out of harm's way, or conduct wildlife salvage and relocation by a qualified biologist or trained Project personnel to safely handle and transport the species Establish Boreal caribou observation and reporting protocol Follow regulatory guidance regarding removal or disturbance of occupied wildlife nests, dens, dams, lodges, and habitat, including obtaining any necessary permits and approvals under the Fish and Wildlife Conservation Act Develop and implement an Erosion and Sediment Control Plan, Wildlife Management Plan, Spill Prevention and Contingency Plan, Site-Wide Water Balance, Air Quality Management Plan, and a Construction Environmental Protection Plan Obtain an Overall Benefit Permit, if required through consultation with the Ministry of the Environment, Conservation and Parks, for impacts to Category 2 Blanding's turtle habitat, Category 3 caribou habitat, and bat roosting habitat within the PA. Consideration will be given to the creation of boreal caribou habitat onsite as part of the Mine Development Closure Plan, in conjunction with other priorities identified through engagement activities
	D	A/P	N/L	PA/LSA/RSA	HS	LT	C	R	
Change in mortality risk	C	A	N/L/M	PA/LSA	HS	LT	C	I/R	
	O, D	A	N/L/M	PA/LSA	HS	LT	IR	I/R	
Change in wildlife health	C, O	A	N	PA/LSA	NS/MS/HS	LT	C	R	
	D	A/P	N	PA/LSA	NS/MS/HS	LT	C	R	
	<ul style="list-style-type: none"> The Project will result in direct habitat loss for wildlife and habitat fragmentation, mainly during the construction phase due to land clearing and site preparation resulting in the direct loss of 11,785 hectares of wildlife habitat, a 22% decrease in habitat from existing conditions in the LSA. This includes the loss of upland forest (2,837 ha), wetland (8,667 ha), water habitat (26 ha), active mineral barrens (0.4 ha), and anthropogenic habitat (254 ha) The direct loss of habitat will represent a 21% loss of habitat for amphibians and reptiles, a 21% loss of habitat for moose, and 21% loss of habitat for furbearers (American black bear, red fox, coyote, Canada lynx, cougar, northern gray wolf and snowshoe hare) in the LSA. Losses are expected to affect local populations by reducing their access to essential habitats, potentially impacting their seasonal movement and feeding behaviors. As such, it is predicted that species distribution will shift to areas of the LSA where suitable habitat is available While there will be a direct loss of SAR and SOCC habitat within the PA and indirect loss in the LSA, it is predicted that species distribution will shift to areas of the LSA where suitable habitat is available. Specifically: <ul style="list-style-type: none"> Midland painted turtle and snapping turtle: direct loss of 21% of the suitable habitat within the LSA Monarch: direct loss of 44% of the suitable habitat within the LSA, although the majority of this habitat is considered marginal, primarily limited to road rights-of-way and transmission lines; similar suitable habitat will be created within the area of proposed transmission line realignment Yellow-banded bumble bee: direct loss of 21% loss of Yellow-banded bumble bee habitat Blanding's turtle: while not recently confirmed within the LSA, direct loss of 0.7% of category 2 habitat for Blanding's turtle (habitat within 2 km of known occurrence) Boreal caribou: no boreal caribou were observed in the southern portion of the Range; however, since the Project is within the Kesagami Range, the Project activities will result in the direct loss of 6,020 ha of Category 3 habitat (habitat outside of known nursery areas, wintering areas, or seasonal ranges) which has a high tolerance to alteration before function is compromised); Indirect effects within 500 m of the PA accounts for an additional 1,113 ha, for a total of 7,133 ha or 11 % of the LSA.; however, since caribou are not currently present (or expected) in this area, effects to the species are not predicted while habitat replacement through restoration at closure will target habitat suitable for caribou should they return Bats: predicted loss of 20% of the potential roosting habitat for bats, including eastern red bat, hoary bat, and silver-haired bat Displaced species will relocate and adapt to their new surroundings with predator-prey dynamics stabilizing. Habitat loss will be incremental, giving wildlife time to adapt to activities occurring within the PA and relocate to the LSA and RSA Habitat alteration, fragmentation, and edge effects are predicted through sensory disturbance (e.g., light, noise, vibrations, smell), which can affect the quality and availability of habitat and access to resources. While some species behaviour is to avoid edge habitat, other species (moose, black bear, coyotes, red foxes) preferentially choose edge habitats for foraging or travelling Impediments to movement associated with the relocated Highway 655 are similar to those that exist for the existing alignment Mortality risk is predicted to increase as a result of potential vehicle collisions and interactions with equipment, particularly for small mammals and amphibians In regard to wildlife health, exposure to potential contaminants was considered negligible to low for all species and unacceptable risks to wildlife are not anticipated Progressive reclamation will be initiated during operations to replace suitable habitats for various wildlife species, including amphibians, reptiles, moose, bats, and boreal caribou (the details of which will be confirmed through the Closure Plan). Following closure of the Project, the area will return to a more natural landscape. 								

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Climate Change									
Change in release of greenhouse gases	C, O, D	A	M	G	NS	LT	IR	I	<ul style="list-style-type: none"> Develop, implement and periodically update a Net-Zero Plan that considers the best available technologies (BAT), including consideration of: <ul style="list-style-type: none"> Biomass chipping and spreading Merchantable timber recovery Passive mineral carbonation In Process Tailings carbonation Site remediation and land reclamation Vehicle and equipment idling policy Vehicle and equipment optimal sizing Vehicle and equipment regular maintenance Traffic Management Plan Strategic site design to reduce haulage distances Use of trolley assist haulage Use of electric vehicles and equipment Use of autonomous vehicles Implement measures to reduce vehicles emissions (idling policy, Tier 4 emissions standards, where feasible) and equipment emissions Implement design measures to reduce emissions, including installing a trolley-assist system on pit ramps to reduce diesel emissions
Change in carbon sinks	C, O, D	P	H	G	NS	LT	IR	R	
	<ul style="list-style-type: none"> Over the life of the Project, this Project will sequester more Carbon dioxide equivalent (CO₂e) than will be emitted by Project activities It is predicted that the Project will release 11,135 kt CO₂e of greenhouse gases (GHG) emissions as a result of the operation of equipment and vehicles (i.e., emissions from the burning of fossil fuels) as well as periodic land clearing and blasting activities It is predicted that the Project will sequester 46,678 kt CO₂e during the Project's lifetime as a result of sequestering during active carbonation (in-process tailing Carbonation), passive carbonation (natural reactions between minerals and atmospheric CO₂ during mining and milling, and after discharge to the TMF and tailings storage in the Open Pit), and reclamation activities, and in consideration of the removal of carbon sinks as a result of site clearing activities 								

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Health									
Change to physical health	C/O/D	P/A/N	L/M	LSA/RSA	N/A	ST/MT	IR/R	R	<ul style="list-style-type: none"> Limit the construction footprint (i.e., PA) to the extent possible to reduce the potential for reductions in groundwater recharge and limit the number of watersheds and subwatersheds overprinted by the PA Install contact water collection ditches around the Stockpiles, Impoundment Facility, and TMF to collect toe seepage and groundwater recharge from these Project components Treat water effluents prior to discharge to the receiving environment, as required, to meet regulatory criteria including an Environmental Compliance Approval issued by the MECP as well as criteria developed through the receiving watercourse Assimilative Capacity Study (Appendix G of the Surface Water Resources Assessment [Appendix C.5 of the Impact Statement]), in addition to the Metal and Diamond Mining Effluent Regulations Impose restrictions within the Modelled Mine Boundary around the Project Area and at receptors R01 and R05 (e.g., install signage and/or gates on trails to restrict access, prevent overnight stays, property acquisition, etc.) Design exterior lighting systems to limit light trespass and to avoid glare (i.e., lighting that targets specific areas, cut-off specifications) Prohibit Project personnel from hunting, fishing, and bringing firearms and fishing gear to the site, while working to limit competition for wildlife and fish species Rehabilitation of the PA in consideration of desired end land uses that are achievable in the preparation of the Mine Development Closure Plan Engage with local municipalities to inform the housing strategy for the area that encourages and provides opportunities for workers to move permanently into the area Undertake a detailed Project accommodation study based on workforce requirements and develop an Accommodations Management Plan Engage in discussions with third parties, including Indigenous nations, to explore opportunities for the provision of accommodations in the region Commit to hiring from the local region and work with third-parties to deliver relevant training, education, and scholarship programs that improve employment opportunities and are targeted at diverse groups such as Indigenous nations, local youth, and various relevant subgroups Provide security at the site and implement several workplace policies which will limit adverse behaviours in the community to manage Project-related demands on police services and to enhance the safety of women in the community and at the site
Change to mental health and social wellbeing	C/O/D	P/A/N	L/M	LSA/RSA	N/A	ST/MT	IR/R	R	
Change in community safety	C/O/D	P/A/N	L/M	RSA	N/A	ST/MT	IR/R	R	
	<ul style="list-style-type: none"> While Project-related contaminants in the air are not likely to be greater than the applicable health-based exposure limits and toxicity reference values at locations where people are expected to be present for extended periods of time (including overnight stays or beyond), some identified contaminants are non-threshold contaminants, meaning any increase in exposure could result in increased risk of adverse health effects (e.g., PM_{2.5}) The presence of mercury in fish tissues and methyl mercury exposures due to consumption of fish is already a regional concern that is managed through MECP, which has issued fish consumption advisories. Changes associated with the North Driftwood Channel realignment are not expected to markedly increase potential exposures to methyl mercury through fish consumption. Project-related activities are not expected to result in increased concentrations of mercury in the environment Actual or perceived changes in food quality, land use, and aesthetics in the LSA/RSA, could lead to reductions in country food availability and accessibility that may affect physical health through diet, nutritional changes, and reduced recreational experiences Project-related population growth and employment of temporary workers (mainly from the construction phase) from outside of the region may increase competition for Indigenous food harvesting, increase infectious diseases, and increase the cost of living Increased housing rental markets could lead to the most vulnerable populations experiencing higher financial pressures and may have to make difficult decisions about the quality and quantity of food they can afford, which puts them at risk for food insecurity. It is expected that independent accommodation providers in the region will provide accommodations for temporary workers as they have for other large projects that will reduce such potential effects The Project is anticipated to result in positive effects on employment, business, and the economy; increased employment rates are linked to better states of health. Residents in the LSA and RSA successful in securing Project-related employment may have reduced financial-related pressures due to employment income, which may bring some families out of food insecurity Being part of a community provides several important benefits that contribute to positive mental health and social well-being which are directly related to community safety The presence of the Project workforce during construction and operations may result in positive effects on services and infrastructure because the workforce will contribute economically to the LSA/RSA (through property and income taxes) representing a potential expansion of municipal tax bases 								
Social Conditions									
Change in demand for services and infrastructure	C/O	A	L	LSA/RSA	NS	ST-MT	C	R	<ul style="list-style-type: none"> Canada Nickel is participating in the "Equal by 30" initiative aimed at increasing benefits to women and to accelerate gender equality and diversity to close the gender gap by 2030
Change in accommodation availability	C/O	A	M	LSA/RSA	NS	ST-MT	C	R	

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Change in demand for transportation infrastructure	C/O	A	L	LSA/RSA	NS	ST-MT	C	R	<ul style="list-style-type: none"> Contribute to social, economic, health, and other activities/programs in local communities through Canada Nickel's Community Contributions Program Commit to hiring from the local region and work with third-parties to deliver relevant training, education, and scholarship programs that improve employment opportunities and are targeted at diverse groups such as Indigenous nations, local youth, and various relevant subgroups Adapt work schedule and crew rotations to decrease the number of non-local workers to decrease the requirement for accommodations where possible Engage with local municipalities to inform the housing strategy for the area that encourages and provides opportunities for workers to move permanently into the area Undertake a detailed Project accommodation study based on workforce requirements and develop an Accommodations Management Plan Engage in discussions with third parties, including Indigenous nations, to explore opportunities for the provision of accommodations in the region Explore providing shuttle bus service for employees to travel to site Maintain access to Lower Sturgeon Dam Road and Camp 40 Road during all Project phases Implement traffic control measures that may include gating of Project access roads and/or gated fencing to restrict public access to the PA Install signage around PA warning land users of the presence of the mine and its facilities Engage with municipal authorities, provincial Crown land use permit holders, local recreational users, Ministry of Natural Resources (MNR) Regional Officials, and landowners about potential disturbances, access restrictions or other conflicts, as appropriate Prohibit Project personnel from hunting, fishing, and bringing firearms and fishing gear to the site, while working to limit competition for wildlife and fish species Rehabilitation of the PA in consideration of desired end land uses that are achievable in the preparation of the Mine Development Closure Plan In accessible areas, leave trees and other vegetation to buffer views Provide in-kind support to the snowmobile club and/or relocate the trail and warming hut or re-establish a snowmobile trail bypass around the PA. Maintain navigation within the North Driftwood River from a series of chain lakes west of the Tailings Management Facility to downstream of the PA Raise awareness and implement policies to support under-represented populations, such as implementation of a Code of Conduct and Ethics, and respectful workplace policies (i.e., Diversity and Inclusion) and cultural awareness training. Continue to engage local Indigenous nations and implement agreements to support present and future engagement and participation in the Project. Additional Indigenous nations will be included in negotiations for long-term agreements (e.g., Impact Benefit Agreement, Mutual Support Agreements as well as additional agreements, as appropriate).
Change in land use designations and private property	C/O/D	A	L	LSA	NS	ST-LT	IR/C	R/I	
Change in recreation	C/O/D	A	L-M	LSA	MS-HS	ST-LT	IR/C	R/I	
Change in resource use	C/O/D	A	L-M	LSA	NS	ST-LT	IR/C	R/I	
	<ul style="list-style-type: none"> Though Canada Nickel wishes to hire primarily from local and Indigenous nations, workers from outside of the region may be required to meet the workforce demand of the Project. This increase in workers coming to the area will place increased demand on local services and infrastructure. <ul style="list-style-type: none"> Demands on other local emergency services, including police and fire protection, will be managed through Project planning and management strategies Effects on local utilities, including water, wastewater, landfills, and transmission infrastructure, are expected to be low in magnitude given the limited demand from the Project and available capacity in these systems In the event that some families move to the area for this Project, the local school system has spare capacity to accommodate families of operations employees; however, childcare shortages (pre-school and daycare services) could present a barrier to residents with children, particularly women, seeking Project employment The presence of the Project may create positive effects such as an increase in permanent and temporary housing stock, contributions to the local economy, and the introduction or renewal of local services Limited impacts on transportation infrastructure, including limited traffic disruptions and additional travel time associated with the realignment highway 655, are predicted Canada Nickel aims to hire primarily from local communities and Indigenous nations, however workers from outside the region may be needed to meet workforce demands which may place an increased demand on accommodations as the number of available temporary accommodations spaces in the LSA/RSA will not likely be sufficient to accommodate the non-local workers <ul style="list-style-type: none"> An accommodations complex (or similar) is not proposed to be developed as part of the Project due to the close proximity of local communities. Canada Nickel is engaging with third parties, including Indigenous nations, which may result in an agreement for the provision of Project accommodations. Should these discussions lead to the development of workforce accommodations for the Project, effects on accommodation availability in the LSA/RSA are predicted to be moderate Despite mitigation and management measures, members of vulnerable groups may still experience differential effects on services and infrastructure and accommodations. Seniors, youth, women, members of Indigenous nations, and low-income families comprise sub-populations in the LSA/RSA who may experience disproportionate effects on infrastructure and services and accommodations. These groups are particularly challenged when it comes to access to childcare and appropriate housing. Canada Nickel is committed to reducing these differential effects to the extent possible The Project is proposed primarily on private lands, with some (450 ha) located on provincial Crown land (unpatented Crown land). Canada Nickel holds or is in the process of acquiring a 100% interest in the mining lands that comprise the Project Direct effects associated with recreation and resource use include restrictions in access to the PA, including a snowmobile trail and removal of navigable waters; however, mitigations are proposed to reduce these effects. Sensory effects (e.g., noise and light) will also affect land users around the PA 								

Residual Effect	Residual Effects Characterization								Key Mitigation Measures
	Project Phase	Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	
Economic Conditions									
Change in employment	C	P	H	LSA/RSA	NS	ST	C	R	<ul style="list-style-type: none"> Continue to engage local Indigenous nations and develop long-term agreements (e.g., Impact Benefit Agreement, Mutual Support Agreements), as appropriate Canada Nickel is participating in the "Equal by 30" initiative aimed at increasing benefits to women and to accelerate gender equality and diversity to close the gender gap by 2030 Commit to hire qualified applicants from the local communities and the region, and to work with third-parties to deliver relevant training, education, and scholarship programs that improve employment opportunities and are targeted at diverse groups such as Indigenous nations, local youth, and various relevant subgroups. Develop a Diversity and Inclusion Policy and promote equality in hiring, operations, and procurement. Encourage contracting and procurement opportunities for Indigenous businesses through enhancement of supplier network development initiatives, including keeping a repository of local and Indigenous suppliers with potential to bid on the Project, and directly contacting Indigenous suppliers regarding procurement opportunities. Raise awareness and implement policies to support under-represented populations, such as implementation of a Code of Conduct and Ethics, and respectful workplace policies (i.e., Diversity and Inclusion) and cultural awareness training.
	O	P	H	LSA/RSA	NS	MT	C	R	
	D	A	M	LSA/RSA	NS	ST	C	I	
Change in business	C	P/A	M	LSA/RSA	NS	ST	C	R	
	O	P/A	H	LSA/RSA	NS	MT	C	R	
	D	P/A	M	LSA/RSA	NS	ST	C	I	
Change in provincial economy	C	P	M	LSA/RSA	NS	ST	C	R	
	O	P	M	LSA/RSA	NS	MT	C	R	
	D	A	M	LSA/RSA	NS	ST	C	I	
<ul style="list-style-type: none"> It is estimated that the Project would create an average of 708 jobs over the life of the mine, with a forecasted maximum of 1,998 Full-Time Equivalent (FTE) positions during construction and up to 1,371 FTEs during operations Forecasted estimates indicate that there could be a shortfall in trained mining workers of 23% to 30% from the region and that mobile workers may be required. Canada Nickel continues to work with local schools and training centers to develop a regional workforce It is estimated that the Project will provide direct income in the range of \$1.2 billion, with an additional \$341 million in indirect labour income across Canada during the construction phase The Project is projected to contribute up to \$18.4 billion across Ontario and \$21.5 billion across Canada in Gross Domestic Profit It is acknowledged that the positive effects of the Project are expected to be unevenly distributed among the labour force, given that the current Indigenous population represents only 16% of the LSA total population and mining labour force in the area is comprised of a higher percentage of non-Indigenous men than other subpopulations. Canada Nickel is committed to reducing these differential effects to the extent possible 									
Project Phase C: Construction O: Operations D: Decommissioning and Closure Direction: P: Positive A: Adverse N: Neutral Magnitude: N: Negligible L: Low M: Moderate H: High			Geographic Extent: PA: Project Area LSA: Local Study Area RSA: Regional Study Area Timing NS: No sensitivity MS: Moderate sensitivity HS: High sensitivity Duration: N: Negligible ST: Short-term MT: Medium-term LT: Long-term			Frequency: S: Single event IR: Multiple Irregular event R: Multiple Regular event C: Continuous Reversibility: R: Reversible I: Irreversible N/A: Not applicable			

24.2 Summary of Significance of Adverse Federal Effects

Where appropriate, Chapters 10 through 23 provide determination of the extent to which adverse federal effects (i.e., adverse effects within federal jurisdiction and any direct or incidental effects) are significant. Direct or incidental effects¹ are defined as effects that are directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of a physical activity or designated project, or to a federal authority's provision of financial assistance to a person for the purpose of enabling that activity or project to be carried out, in whole or in part (*Impact Assessment Act*, 2019).

Table 24.2 provides a summary of the extent to which the adverse federal effects are significant based on the predicted effects from this Project, as determined in Chapter 10 through 23 for the following VCs:

- fish and fish, including any aquatic SAR (see Chapter 17)
- migratory birds, including any migratory bird species subject to SARA (see Chapter 18)
- health, as it pertains to the health of Indigenous People (see Chapter 21)
- wetlands, as they may be impacted through a *Fisheries Act Authorization* or Authorization under the *Metal and Diamond Mining Effluent Regulations* (see Chapter 16)
- navigable waters, as they may be impacted through approvals and/or exemptions under the *Canadian Navigable Waters Act* (see Chapter 22)

A summary of the extent of significance of adverse federal effects on Indigenous Interests, including the current use of lands and resources for traditional purposes, any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, physical and cultural heritage, or the social or economic conditions of Indigenous Peoples is provided in Chapters 25 to 28.

¹ "Directly linked" refers to any environmental effect that is the direct result of activities that are enabled by a federal decision. "Necessarily incidental" refers to an effect, beyond those effects directly linked, that would not have otherwise occurred if there was not a federal decision.

Table 24.2 Summary of Significance of Effects Within Federal Jurisdiction

Adverse Federal Effects	Extent of Significance	Rationale
Vegetation, Riparian, and Wetland Environments		
Change in direct fish habitat wetlands	Moderate	<ul style="list-style-type: none"> • The Project will result in a net loss of 115 ha of wetlands supporting fish habitat. • Given the abundance of fish-supporting wetlands in the LSA (30,920 ha) and RSA (413,785 has), the relatively small changes in wetlands area restricted to the PA are not predicted to threaten the long-term viability and quality of wetlands in the RSA • Reduction in fish-supporting wetland area in the LSA and RSA during construction and operation is not expected to result in a substantial reduction in wetland function, with remaining wetlands in the LSA likely adequate to provide continued such support • The majority of direct fish habitat wetland loss will occur during construction as a result of stripping, grading, and other construction activities and will continue through operations, however progressive restoration will reverse a portion of the habitat loss beginning in operations and habitat within the LSA that was lost due to disturbance is expected to return to baseline conditions following decommissioning and closure
Fish and Fish Habitat		
Change in fish habitat	Moderate	<ul style="list-style-type: none"> • The alteration or loss of fish habitat caused by construction and operation of the Project is expected to result in a moderate magnitude effect for the fish populations in the North Driftwood River watershed • Direct loss of all headwater streams, ponds, and mainstem channel within the PA will negatively affect the forage fish populations that rely on this habitat for all their life stages and will negatively affect the northern pike, white sucker, and walleye populations that reside in this habitat or rely on the contributions of flow, nutrients, organic debris, invertebrates, and sediment that these headwater areas provide in the North Driftwood River mainstem downstream of the PA • However, the offsetting measures that Canada Nickel will implement will counterbalance these unavoidable habitat effects, including offsets in the North Driftwood River Diversion Channel that will benefit fish populations in the North Driftwood River watershed, and none of the potentially affected habitat is used by lake sturgeon, the only aquatic species at risk near the Project • Canada Nickel will require a paragraph 35(2)(b) <i>Fisheries Act</i> authorization from DFO prior to construction of the Project, an authorization that will require Canada Nickel to design and implement habitat restoration, enhancement, or creation that counterbalance the harmful habitat impacts, including the time lags and uncertainties associated with the habitat offsets • The effects of changes in flow are expected to be more noticeable in the downstream riffle habitats, the amount of which is low owing to the low gradient of the stream and rivers affected by the Project. Effects would be limited to low-flow periods throughout all Project phases, and reversible, with flows returning close to baseline following the end of the Project

Adverse Federal Effects	Extent of Significance	Rationale
		<ul style="list-style-type: none"> Adverse effects to fish habitat are not anticipated to extend spatially beyond the LSA downstream of the Project
Change in fish health, growth, or survival	Moderate	<ul style="list-style-type: none"> Adverse effects to fish health, growth, and survival will result from changes in water quality and possible reduction in aquatic invertebrate abundance The effects will be of moderate magnitude, long-term and continuous, as there will be ongoing effluent discharge for the duration of the Project, and reversible, as effluent discharge will cease at the end of the Project and water quality would be expected to return to conditions close to baseline following decommissioning and closure
Birds and Bird Habitat		
Change in migratory bird habitat	Moderate	<ul style="list-style-type: none"> Land clearing and development within the PA will result in the direct loss of 11,785 ha of habitat that may be used by migratory birds, including 2,837 ha of upland forests, 8,667 ha of wetland, and 255 ha of anthropogenic and poorly vegetated habitats. There will be an anticipated loss of 7,605 ha (a 19% decrease from the LSA) of habitat for forest birds and raptors (forests and swamps), 752 ha (a 58% decrease) of marsh bird habitat, and 26 ha (a 9% decrease) of waterbird habitat. Direct habitat loss is restricted to the PA, whereas indirect habitat loss due to edge effects and sensory disturbance (i.e., noise) will extend to the LSA, which is conservatively estimated as 3,371 ha. However, progressive reclamation will reverse a portion of the habitat loss beginning in operations and habitat within the LSA that was lost due to disturbance is expected to return to baseline conditions following decommissioning and closure. Progressive reclamation will restore habitat for some groups of migratory birds, but some habitat types (e.g., mature forest, bogs/fens), will be slow to recover and loss was therefore considered irreversible. Following active closure, habitat for migratory birds that rely on aquatic habitats (e.g., waterbirds, waterfowl) is expected to increase due to the establishment of lakes and ponds in the PA. For all species guilds and species, the suitable habitat remaining within the RSA ranges from 94% to 99%.
Change in species at risk habitat	Canada Warbler – Moderate	<ul style="list-style-type: none"> There will be a direct loss of 10,085 ha (3%) of the available Canada Warbler habitat within the RSA, plus indirect loss due to sensory disturbance during construction, operations and commissioning. No Critical Habitat for Canada Warbler was defined in the Recovery Strategy due to a lack of understanding of habitat requirements. Changes in abundance and distribution of Canada Warblers in the LSA is not expected because sufficient habitat is expected to be available in the RSA.

Adverse Federal Effects	Extent of Significance	Rationale
	Bank Swallow – Negligible/low	<ul style="list-style-type: none"> • Barn Swallow have not been observed within the PA or LSA, and no suitable habitat was documented. • This species are tolerant of human disturbance and are known to nest in anthropogenic habitats (aggregate pits, stockpiles).
	Barn Swallow – Negligible/low	<ul style="list-style-type: none"> • Bank Swallow have not been observed within the PA or LSA, and no suitable habitat was documented. • This species are tolerant of human disturbance and are known to nest in anthropogenic habitats (bridges/culverts).
	Eastern Whip-poor-will – Negligible/low	<ul style="list-style-type: none"> • Eastern Whip-poor-will was not documented in the PA or LSA during targeted surveys, so if present would likely only occur at a low density • Suitable habitat may be present in the LSA but will also be readily available in the RSA .
Change in mortality	Negligible/low	<ul style="list-style-type: none"> • The potential for an increase in mortality of migratory birds is most likely associated with impacts to bird nests and flightless birds. • Through the implementation of mitigation including avoidance of vegetation clearing during the breeding bird season, the likelihood of increased bird mortality is reduced, and it is expected that birds will avoid the PA and associated construction activity due to the high levels of disturbance (i.e., noise, human presence) and due to the loss of suitable habitat. • Increased mortality risk associated with the operation of the relocated highway and transmission lines is expected to be negligible given that these relocated facilities already exist and no substantive increase in traffic is anticipated.
Navigable Waters		
Changes to navigation	Moderate	<ul style="list-style-type: none"> • Residual effects on navigable waters include the direct loss or alteration of navigable waters within the PA, including approximately 15 km of watercourse where navigation is likely (i.e., North Driftwood River) and approximately 25 km of watercourse where navigation was characterized as 'uncertain' (i.e., downstream reaches of tributaries to the North Driftwood and West Buskegau Rivers). Additional field validation and discussion with Transport Canada is required to confirm these watercourses where navigation is uncertain. • There are no scheduled waterways affected by the Project. • Navigation along the North Driftwood River will be maintained throughout the Project, and the revised channel alignment will be designed so that the North Driftwood River remains navigable around the Project and to maintain navigation between the lakes outside the PA and the North Driftwood River during operations. • As other navigable watercourses are available in the LSA/RSA, it is predicted that this recreational activity will be able to continue at or near current levels.

Adverse Federal Effects	Extent of Significance	Rationale
Health		
Changes to Indigenous health	Low / moderate	<ul style="list-style-type: none"> • While Project-related contaminants in the air are not likely to be greater than the applicable health-based exposure limits and toxicity reference values at locations where people are expected to be present for extended periods of time (including overnight stays or beyond), some identified contaminants are non-threshold contaminants, meaning any increase in exposure could result in increased risk of adverse health effects (e.g., PM_{2.5}). • Project-related activities are not expected to result in increased concentrations of mercury in the environment or risks associated with methyl mercury exposures due to the consumption of fish. • Actual and perceived changes in food quality, land use and aesthetics could lead to reductions in country food availability and accessibility. • Indigenous peoples may experience higher financial pressures and increased risk of food insecurity as a result of increased demand on housing and financial pressures, which could affect the mental health and social wellbeing of Indigenous peoples, although effects will be reduced through increased housing supply by independent accommodation providers in the region. • Project-related population growth and employment of temporary workers (mainly from the construction phase) from outside of the region is not anticipated to affect community safety of Indigenous peoples. • Overall for the effects pathways evaluated changes may be largely unchanged from baseline conditions or reduced but not eliminated compared to baseline conditions.