

Appendix F

Conceptual Closure Plan

Crawford Nickel Project: Conceptual Closure Plan

September 30, 2024

Prepared for:

Canada Nickel Company



Prepared by:

Stantec Consulting Ltd.



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Acronyms and Abbreviations

K	thousand
m ³	cubic metre
Mm ³	million cubic metres
µg/L	micrograms per litre
amsl	above mean sea level
ARD	acid rock drainage
CDA	Canadian Dam Association
CO ₃ -NP	neutralization potential measured from carbonate content
CWQG-FAL	Canadian Water Quality Guidelines for the protection of Freshwater Aquatic Life
DEF	Diesel Exhaust Fluid
DO	dissolved oxygen
ECA	Environmental Compliance Approval
EZ	East Zone
H:V	horizontal:vertical slope
HCT	humidity cell test
HDPE	high density polyethylene
ITRB	Independent Tailings Review Board
kt/d	kilotonnes per day

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kV	kilovolt
kW	kilowatt
LOM	life of mine
M	million
MDMER	Metal and Diamond Mining Effluent Regulations under the <i>Fisheries Act</i>
MECP	Ministry of the Environment, Conservation and Parks
MINES	Ministry of Mines
ML	metal leaching
MNRF	Ministry of Natural Resources and Forestry
MNR	Ministry of Natural Resources (Formerly Ministry of Natural Resources and Forestry [MNRF])
Mt	million tonnes
MTO	Ministry of Transportation
MVA	mega volt amp
MZ	Main Zone
NP	neutralization potential
NPAG	not potentially acid generating
O. Reg.	Ontario Regulation
OGS	Ontario Geological Survey
OMS	Operations, Maintenance and Surveillance

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ONR	Ontario Northland Railway
PA	Project Area
PAG	potentially acid generating
PoPC	parameters of potential concern
PTTW	Permit To Take Water
PWQO	Provincial Water Quality Objectives
ROM	Run of Mine
SAG	semi-autogenous
TMF	tailings management facility
tpd	tonnes per day

1 Introduction

Canada Nickel Company (Canada Nickel) proposes to develop, construct, operate, and progressively reclaim a new open pit nickel mine and processing facility, collectively known as the Crawford Nickel Project ('the Project'), approximately 42 kilometres (km) north of Timmins, Ontario. The Project includes the development of an Open Pit, Stockpiles, Tailings Management Facility (TMF), Impoundment Facility, two ore Processing Plants, and other mine-related infrastructure, as well as a new rail spur line and the relocation of Highway 655 and existing 500 kilovolt (kV) transmission line (Figure A.1 and Figure A.2, Appendix A). Ore will be extracted from a single Open Pit that will be divided into an East Zone (EZ) and Main Zone (MZ). The size of the Project Area (PA) is 11,785 hectares (ha) (118 square kilometres [km²]) which has a mineral reserve estimate of 1,715 million tonnes (Mt), with an expected Project life of 41 years.

Based on the current Project design, the maximum rate of ore extraction will be up to 240,000 tonnes per day (tpd) and an estimated average rate of 160,000 tpd over the life of mine (LOM) (i.e., yearly average expressed daily based on a total of 1,715 Mt of ore extracted over 30 years). The two ore processing plants and associated service facilities will process run of mine (ROM) ore, as well as ore stockpiles in the final years of the mine, to produce nickel concentrate, magnetite concentrate, and tailings at a rate of approximately 60,000 tpd at the start of mine life, ramping up to a maximum of 120,000 tpd. In addition to nickel and iron, other metals such as cobalt, chromium, palladium, and platinum are expected to be recovered in concentrate streams.

The current life of the proposed Project is expected to be approximately 41 years. Mining would be completed at a faster pace than milling; thus, mining of ore would occur for about 30 years, then milling alone for the last 11 years using existing stockpiles.

In preparing this Conceptual Closure Plan, Stantec Consulting Ltd. (Stantec) personnel relied on supporting documentation listed in Section 10, with text taken directly from some sources.

1.1 Legislative Requirements

The requirements of a closure plan and of closing out a mining project are set out in the Ontario *Mining Act*, R.S.O. 1990, c. M.14 and the Mine Rehabilitation Code of Ontario, as set out in Ontario Regulation (O. Reg.) 35/24. As a requirement of O. Reg. 35/24, the Mine Development Closure Plan will discuss rehabilitation activities that are to be implemented during a temporary suspension of mining, during a state of inactivity, and to achieve final close out. This Conceptual Closure Plan has been prepared to support the Impact Statement and provides preliminary details on the progressive rehabilitation and closure plans for the Project to demonstrate Canada Nickel's commitment to responsible development and planning the Project with closure in mind in Phase 3 of the Impact Assessment process.

This Conceptual Closure Plan is not intended to meet all of the requirements for a Closure Plan as required under O. Reg. 35/24 but is provided to:

- support the Impact Statement by providing the rehabilitation measures to be implemented during closure clearly for the purposes of fully evaluating the potential effects and necessary mitigation and monitoring measures for the Project
- support consultation activities during the development of the Mine Development Closure Plan
- provide the basis for future planning and design updates that will be completed to support the filing of a Mine Development Closure Plan with the Ministry of Mines (MINES) during the permitting period of the Project

The Conceptual Closure Plan provides the overall closure objectives for the Project and preliminary details on the proposed progressive rehabilitation and final closure activities after mining operation.

The Project will be 'closed out' once the following requirements are met and a corresponding Notice of Project Status has been submitted to, and accepted by, MINES:

- the closure objectives are met, as defined through ongoing discussions with key stakeholders, including end land use and function (Section 8)
- applicable regulatory requirements are met, including O. Reg. 35/24 as set out in the *Mining Act*

An outline of anticipated monitoring is provided and will form the basis for determining when final close out of the Project is achieved. This monitoring will be further informed through the operations phase of the Project as model predictions are verified with monitoring and specific testing programs to be implemented to verify closure designs.

1.2 Closure Objectives

At the end of Project operations, the main features requiring closure will include the Open Pit, Impoundment Facility (split into three areas for rock, clay, sand and till), East and West Stockpiles, light vehicle and haul roads (including culvert removals), TMF, buildings and associated infrastructure, and water management facilities for contact water including ditches and ponds. The primary objectives of rehabilitation and closure activities are to establish a PA that has:

- been stabilized physically, chemically, and biologically, for both the terrestrial and aquatic landscape
- re-established surface drainage
- discharge water that meets effluent surface water and groundwater quality criteria
- rehabilitated areas of ground disturbance, where practical
- self-sustaining vegetative cover, where practical, on reclaimed areas

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These objectives are intended to support and promote the following possible end land use for areas in the PA disturbed by mine infrastructure:

- vegetation communities that support habitat for local species diversity with considerations given to species at risk
- establishment of self-sustaining water management systems that support aquatic life and native vegetation that reflect pre-mining conditions

End land use goals will be further defined through ongoing engagement throughout the Project as closure and rehabilitation activities are refined and informed by as-built conditions and operational data.

After closure activities have been completed, a post-closure monitoring program, detailed in Section 7, will be carried out to verify that the closure objectives and criteria have been met and confirm that the Project can proceed to final close-out status.

2 Project Information

2.1 Proponent Information

The Proponent of the Project is the Canada Nickel Company. Contact information is as follows:

Name of Proponent:	Canada Nickel Company
Mailing Address of Proponent:	130 King St. West Suite 1900 Toronto, Ontario M5H 2V1 Email mathieuboucher@canadanickel.com
Contact Person:	Mathieu Boucher
Project Location:	Townships of Crawford and Lucas District of Timmins

The Project comprises approximately 11,785 ha along Highway 655 approximately 42 km north of the City of Timmins, Ontario, in the geographic townships of Crawford, Carnegie, Kidd, Lucas, Beck, Nesbitt, Wark and Prosser. The proposed Highway 655 realignment and rail spur line extend into the geographic townships of Kidd and Wark.

The nearest communities are the Town of Cochrane (35 km to the northeast), the City of Timmins (42 km to the south) the Town of Smooth Rock Falls (50 km to the northwest) and the Town of Iroquois Falls (50 km to the east).

2.2 Land Tenure

The Project is defined by a combination of 162 mining patents and 161 mining claims. As of the effective date of the report, Canada Nickel holds or is in the process of acquiring a 100% interest in the mining lands that comprise the PA. Canada Nickel is currently working with MINES to complete this process.

The footprint of the Project comprises mostly privately held surface rights. Canada Nickel is currently working with landowners to obtain surface rights. Parts of the Project are also provincial Crown lands, and reservations to the Crown exists on privately held lands.

2.2.1 Claims to Lease

In July 2023, Canada Nickel applied to MINES to acquire 16 mining leases for 137 mining claims situated in the Township of Crawford, Porcupine Mining Division (Table 2.1).

Table 2.1 Mining Claims Requested for Lease

File No.	Mining Claim No.	Surface Rights Requested	Mining Rights Requested
MIL 14-2 06/23	171995 171996 222029 256604 256605 305769 312574 325300 334714		X
MIL 14-2 10/23	113475 139909 139910 164725 224132 224133 230779 307890 327922		X
MIL 14-2 07/23	105177 159418 194029 230783 248624 307897 307898 314635 331930	X	X
MIL 14-2 11/23	111361 130535 147108 167982 193796 205922 205923 213242 242401 250456 271941 309733 309734 309735 316442 333029 590970	X	X
MIL 14-2 08/23	105176 254736 291950 321102 321103	X	X
MIL 14-2 09/23	158708 164003 164004 203341 247900 247901 331719 331720		X
MIL 14-2 12/23	109668 109669 129456 129457 212249 337123		X
MIL 14-2 13/23	160092 212747 249992 249993 260736 308592 315319 328599 332101	X	X
MIL 14-2 17/23	585124 585125 585126 585127 585128 585129	X	X
MIL 14-2 14/23	136045 167269 252439 271200 318442 332656	X	X
MIL 14-2 18/23	561936 585120 585121 585122		X
MIL 14-2 15/23	169074 169075 169076 182533 254716 254717 321076	X	X
MIL 14-2 19/23	130662 195379 225503 250662 269338 269339 316508 332283 332284		X
MIL 14-2 16/23	158482 203181 254715 275855 275856 313693	X	X
MIL 14-2 20/23	535130 535131 535132 535133 535134 535136 535137 535138 535140 535141 535143 535144 535146 535148 535150 535152 535153 535154 535155	X	X
MIL 14-2 21/23	164775 164776 194046 224160 230810 248653 260101 307924	X	X

3 Current Project Condition

This section provides a brief overview of the current condition of the PA. For the purposes of describing the conditions within the anticipated area of physical disturbance associated with the construction and operations of the Project, the term PA is used (Figure A.2, Appendix A).

3.1 Land Uses

The Project is located approximately 42 km north of the City of Timmins, Ontario in the geographic townships of Crawford, Carnegie, Kidd, Lucas, Beck, Nesbitt, Wark, and Prosser. The Project is readily accessible year-round by Highway 655.

The nearest communities to the PA are the Town of Cochrane (35 km to the northeast), the City of Timmins (42 km to the south), the Town of Smooth Rock Falls (50 km to the northwest), and the Town of Iroquois Falls (50 km to the east).

Existing land uses in the area include mineral exploration, logging, recreation, and historical mining. These land uses are located on a mix of surface and mining patents and Crown lands with a mix of private land ownership. There are no federal parks near the PA and the closest provincial parks are Mahaffy Township Ground Moraine Conservation Reserve, located approximately 15 km to the northwest; Greenwater Provincial Park (non-operating, natural environment park with no facilities), located approximately 49 km to the north; and Kettle Lakes Provincial Park (day use and overnight camping facilities), located approximately 80 km east of the PA.

Today, the most extensive land uses within the PA are forestry operations and consumptive recreation such as hunting (i.e., moose, waterfowl) and fishing.

There are no First Nation Reserve lands proximal to the PA although the PA is anticipated to be within proximity to the traditional or operating regions of several Indigenous nations that have expressed interest in the Project.

3.2 Topography

The Project is located within the Lake Abitibi Ecoregion of Ontario (Ecoregion 3E), a part of the Ontario Shield. This region sits on top of the Precambrian Shield, that is overlain by diverse surficial geology which is composed of both glacial and post-glacial processes. The topography across the PA is flat to gently undulating, typical of the glaciated Canadian Shield. PA elevations range from about 265 to 290 metres (m) above mean sea level (amsl), with topographic local relief averaging about 15 m. The few rare areas of relief are associated with an esker complex, locally entrenched river systems, and a few rare bedrock outcrops.

3.3 Surface Water

The Project is located primarily between the North Driftwood River and the West Buskegau River, both of which drain north into the Abitibi River. Jocko Creek crosses the southern portion of the PA and drains into Kidd Creek and subsequently the Mattagami River. Several lakes located adjacent to the PA drain into the North Driftwood River.

Both desktop and field methods were used to characterize baseline surface water quantity and quality conditions within the lakes and rivers in the area. Desktop analysis included watershed delineation, a climate and climate change assessment, regional hydrological assessment (streamflow monitoring stations operated by the Water Survey of Canada), bathymetric assessment, an environmental water balance, and the development of a hydrological model.

In-field surface water quality was measured at each station using hand-held water quality meters. Parameters measured included: water temperature, pH, conductivity, and dissolved oxygen (DO) concentration. *In situ* water quality measurements were conducted at 1 m depth intervals at the deepest location in select lakes in spring, summer, and fall. Manual and continuous measurements of surface water flow were measured at 11 stations, including two stations performing lake level monitoring. *In situ* flow measurement results, rating curves, and station hydrographs for each applicable station were developed and presented. Hydrometric station watershed areas ranged from 7.2 to 199 km² and ice-free condition *in situ* flow measurements were used to develop rating curves at seven stations.

Regional and local water quality assessments were conducted to analyze and describe water quality conditions in the PA. Regional water quality data was obtained from seven Provincial Water Quality Monitoring Network stations. In the PA, a total of 317 surface water quality samples were collected from 2021 to December 2023 at 33 watercourse locations and 13 waterbody locations across three main watersheds. The three main watersheds located within proximity to the Project include the North Driftwood River, West Buskegau River, and Jocko Creek (a tributary of the Mattagami River). These rivers ultimately converge with the Moose River with an ultimate discharge into James Bay. Local general water quality in the watercourses and waterbodies identified slightly acidic conditions, with three parameters of potential concern (PoPC) identified based on 75th percentile concentration exceedances of provincial and/or federal guidelines (phosphorus, aluminum, and iron). Both the regional and local water quality exhibited seasonal trends for various parameters. Concentrations of parameters were typically higher in the late fall and winter months and lower in the spring and summer months. Results were comparable across the various watersheds.

Additional details related to the surface water hydrology and water quality are presented in the Surface Water Resources Baseline Report (Appendix B.6 of the Impact Statement).

3.4 Groundwater

Desktop and field methods were used to characterize baseline groundwater conditions for the Project. The desktop data review included mapping and reports from the Ontario Geological Survey (OGS), Permits to Take Water (PTTW) and water well records from the Ontario Ministry of the Environment, Conservation, and Parks (MECP), climate data from Environment Canada, and other hydrogeological information provided by Canada Nickel including an exploratory borehole database containing information on more than 350 boreholes. A groundwater monitoring network was established that included the installation of monitoring wells and drive-point piezometers followed by water level monitoring (manual and automated) and groundwater quality monitoring. *In situ* hydraulic response testing was completed at 26 monitoring wells to estimate the hydraulic conductivity of overburden and shallow bedrock. Hydraulic testing of bedrock to depths of 465 m below ground surface (bgs) was completed to assess hydraulic conductivity of bedrock in the area of the Open Pit.

Groundwater Quantity

Groundwater levels fluctuated less than 0.5 m over the approximately year and a half of monitoring data, with generally lower groundwater levels in winter with a slight rise in groundwater levels following the spring freshet. The lack of groundwater level response to precipitation and a muted seasonal groundwater level response is likely attributable to the lack of topographic relief and thick overlying layers of sand and/or clay across the PA. Groundwater elevations for the deep confined glaciofluvial aquifer are under pressure, with groundwater elevations measured above the top of the aquifer. Groundwater flow is regionally to the north towards James Bay with localized flow toward the West Buskegau River, North Driftwood River, and Mattagami River.

Groundwater Quality

Groundwater quality monitoring was completed at up to 27 monitoring wells on three occasions between 2022 and 2023. Groundwater samples were collected and submitted to an accredited laboratory for analysis of general chemistry parameters, free cyanide, ammonium, ammonia, low-level mercury, anions, and dissolved metals.

Mean overburden groundwater concentrations of iron, manganese, sodium, hardness, and pH exceeded the Ontario Drinking Water Quality Standards (ODWQS) and/or the Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ). Mean overburden groundwater concentrations of arsenic, cyanide, fluoride, iron, and phosphorus exceeded the Provincial Water Quality Objectives (PWQO; MOEE 1999) and/or the Canadian Water Quality Guidelines for Freshwater Aquatic Life (CWQG-FAL; CCME 2019).

Within bedrock monitoring wells, the mean groundwater concentrations exceeded the ODWQS and/or the GCDWQ for hardness, iron, manganese, and pH. The mean bedrock groundwater concentrations also exceeded the PWQO objectives and/or the CWQG-FAL for ammonia, boron, cyanide (total and free), fluoride, iron, phosphorus, and pH.

Elevated concentrations of arsenic, fluoride, hardness, iron, manganese, and phosphorus above regulatory criteria are typical of groundwater in Ontario and are reflective of the natural mineralization and geochemical processes in the area.

Water Wells

Based on a review of the MECP Water Well Records database, there are three wells located within the PA, one of which is abandoned. The other two wells are registered as supply wells, one being a commercial water supply well screened within a sand and gravel overburden aquifer, and the second being a domestic supply well screened in bedrock. An additional five properties with the potential to be supplied by water supply wells have been identified through field reconnaissance although they are not in the MECP Water Well Records database; details of potential well construction are unknown.

Additional details related to the subsurface conditions and groundwater flow and quality are presented in the Groundwater Baseline Report (Appendix B.5 of the Impact Statement).

3.5 Wildlife and Wildlife Habitat

Wildlife habitat is defined as areas where plants, animals, and other organisms live and can find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a point in their annual life cycle and those areas which are important to migratory and non-migratory species. Wildlife habitat is considered "significant" if it is deemed ecologically important in terms of feature, function, representation, or amount, and contributes to the quality and diversity of an identifiable geographic area or Natural Heritage System (MMAH 2020). WSP Canada Inc. (WSP) completed baseline field investigations for terrestrial wildlife and wildlife habitats. Aerial and field surveys were conducted between 2021 and 2023.

Based on the conditions documented through WSP's field investigations, 19 candidate, 6 confirmed, and 2 confirmed and candidate Significant Wildlife Habitat (SWH) types were identified. Seasonal concentration areas of wildlife that aggregate throughout specific times of the year fluctuate naturally.

Aerial surveys identified a total of six mammal species. Moose were directly observed during the surveys. Tracks of moose, North American river otter, North American gray wolf, lynx, American marten, and snowshoe hare were observed throughout the investigation area. Although the Project is located along the southern boundary of the Kesagami Caribou Range for boreal caribou, field studies initiated in 2021 and continued in 2022 did not identify the presence of boreal caribou in the area. Through engagement, Flying Post First Nation confirmed that boreal caribou have not been observed around the PA or Wildlife and Wildlife Habitat Local Study Area.

Surveys were conducted across 119 plots in the PA during 2021 for bat maternity roosting habitat. Additional desktop surveys informed results. The most frequently recorded species was the silver-haired bat, followed by the hoary bat. The presence of northern myotis could not be confirmed, and thus must be considered in further technical studies.

A mapping exercise was conducted to target potential nesting habitat, functional habitat, and potential expanses of overwintering habitat across the PA for Blanding's turtle. Aerial surveys were used to observe potential overwintering habitat and assess landscape water features for suitability.

Additional information can be found in the 2023 Terrestrial Ecology Baseline Study (Appendix B.7.4 of the Impact Statement) as well as in the Terrestrial Wildlife and Wildlife Habitat Supplemental Baseline Report (Appendix B.7.3 of the Impact Statement).

3.6 Aquatic Habitat and Fisheries

Streams and rivers in the PA are part of the Hudson Bay watershed. The PA is mainly located in the headwaters of the West Buskegau River and North Driftwood River watersheds, with a small portion extending into the Jocko Creek watershed. The majority of watercourses identified in the three watersheds are characterized by slow flowing, low-gradient channels with steep sides, and active, abundant beaver dam activity. For the West Buskegau River and North Driftwood River, substrate of the main channels consists of depositional fine materials, predominantly clay and organics.

The fish habitat within the river systems in the area of the Project is typical of northeastern Ontario, composed of channels with dense shrubby riparian vegetation, wetland segments with ponds, as well as abundant evidence of beaver activity. The substrate is primarily composed of fine-grained sediment with high organic content attributed to the wetland habitats and also beaver inputs. The beaver dams provide some seasonal fragmentation of these watercourses; however, they do not pose year-round barriers to fish passage as demonstrated by fish presence throughout the sampled areas of the Project.

Initial baseline studies documented the presence of 17 fish species within the investigation areas. The local fish communities are mostly represented by small-bodied, forage fish species such as shiners, dace and minnows that prefer a cool water thermal regime. Other large-bodied fish species, including Northern Pike and White Sucker, are found mostly in their juvenile life stages, whereas adults of these species can be found within the larger waterbodies such as Gerry Lake and Martin Lake, as well as the Mattagami River that is located to the west of the Project.

Additional details related to the aquatic habitat and fisheries are presented in the 2021-2023 Fish and Fish Habitat Baseline Report (Appendix B.8.2 of the Impact Statement) and in the Fish and Fish Habitat Supplemental Baseline Report (Appendix B.8.1 of the Impact Statement).

3.7 Vegetation, Riparian and Wetland Environments

The PA is located within Ecoregion 3E, the Lake Abitibi Ecoregion, which was used when classifying vegetation communities. Ecoregion 3E falls within the boreal forest region with landcover consisting of mixed forest (30%), coniferous forest (28%), sparse forest (11%), deciduous forest (7%), cutover (8%), and water (7%).

Extensive vegetation inventories have been undertaken. A total of 238 species of vascular and non-vascular plants were identified during field investigations, and provincially rare plants were documented. Twenty-five distinct plant communities (upland and wetland) were recorded. Coniferous

forest and swamp communities dominate the area within the PA. Of the species present, 85% are native to Ontario, and 15% are non-native species. One species of conservation concern, Black Ash, was recorded at two locations. Black ash is a tree species that is widespread and common but in rapid decline due to the invasive emerald ash borer beetle.

WSP collected extensive baseline inventories for flora and vegetation communities. Coniferous forest and swamp communities dominate the area within the preliminary PA. Bogs and fens are common throughout the PA. No species at risk or provincially rare plants were documented within the PA.

Additional information is provided in the 2023 Terrestrial Baseline Study Report (Appendix B.7.4 of the Impact Statement) and the Vegetation, Riparian and Wetland Environments Supplemental Baseline Report (Appendix B.7.1 of the Impact Statement).

3.8 Geochemistry

The potential for metal leaching and acid rock drainage (ML/ARD) from materials generated, exposed, and stored at the Project was investigated by WSP in the Crawford Geochemistry Characterization Report (Appendix H of the Impact Statement). The geochemical assessment was based on 299 waste rock samples, 109 ore samples, four tailings samples, and 50 overburden samples. The samples underwent static testing (mineralogical analysis, acid-base counting [ABA], shake flask extraction tests, and solid phase elemental analysis) and kinetic (humidity cell tests) testing to characterize their ML/ARD potential.

The capacity of a sample to generate acidity or neutralize acid is referred to as the acid potential (AP) and the neutralization potential (NP), respectively. Neutralization potential was classified using two analytical methods: carbonate NP (CO₃-NP) and the modified Sobek NP method. The ratio of NP to AP is commonly used to evaluate the potential for a material to generate AP. Based on such a ratio, samples are classified as potentially acid generating (PAG), uncertain, or non-potentially acid generating (NPAG). The ML testing for humidity cell tests included assessing whether parameter mass loadings were associated with first flush or long-term leachate discharge. Shake flask extraction was conducted to identify soluble constituents from the test materials (Appendix H of the Impact Statement). The geochemical characterization methodology is outlined in the Crawford Geochemistry Characterization Report (Appendix H of the Impact Statement) guided by the Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials (MEND 2009), which is a nationally recognized guide for the evaluation of ML/ARD potential.

Additional information can be found in the Crawford Geochemistry Characterization Report (Appendix H of the Impact Statement).

4 Project Description

The timing of activities and installation of Project components will occur in sequence to allow for the efficient extraction of materials. Various construction, operations, and decommissioning activities are proposed throughout the life of the mine. For the purposes of the assessment, these Project activities are anticipated to be advanced in three phases:

- Construction (Year -3 to Year -1)
- Operations
 - Operations phase 1 (Year 1 to Year 5): 60 kilotonnes per day (kt/d) milling capacity with ore extraction
 - Operations phase 2 (Year 5 to Year 30): 120 kt/d milling capacity with ore extraction
 - Operations phase 3 (Year 30 to Year 41): 120 kt/d milling capacity with no ore extraction
- Decommissioning and closure
 - Active closure (Year 41 to Year 46)
 - Passive closure (Year 46+)

The two ore Processing Plants and associated service facilities will process ROM ore, as well as ore Stockpiles in the final years of the mine, to produce nickel concentrate, magnetite concentrate, and tailings. In addition to nickel and iron other metals such as cobalt, chromium, palladium, and platinum are expected to be recovered in concentrate streams.

Concentrate from the Processing Plants will be loaded onto rail cars and shipped via the rail spur line for refinement off site by others.

The key components of the Project are as follows:

- Open Pit
- TMF
- Impoundment Facility
- ore processing components
- mining infrastructure
- water management
- aggregate sources

Sections 4.1 to 4.6 provide a summary of the main Project components that will be developed and require management through closure. Details for each Project component will be provided in the Mine Development Closure Plan to be developed following completion of the Final Impact Statement.

Section 4.7 includes supporting ancillary facilities and infrastructure that is required by the Project but will be managed by others.

4.1 Open Pit

The Project will be developed as an open pit operation designed around two discrete, although overlapping, ore bodies – the Main Zone (MZ) and the East Zone (EZ). The Open Pit is located in the centre of the PA between the TMF to the south and Impoundment Facility to the north.

The MZ and the EZ of the Open Pit contain an approximately equal tonnage of ore. An estimated 5,932 Mt of material will be removed from the Open Pit, including overburden, waste rock, and ore, which includes an estimated 1,715 Mt of ore suitable for processing. The ultimate Open Pit will cover an area of approximately 992 ha, measuring 4,400 m by 3,100 m, extending to a depth of approximately 690 m.

Development of the Open Pit will occur sequentially commencing in Year -2 (2 years prior to the start of milling operations). The Open Pit will be developed as two zones with a saddle separating the MZ from the EZ. The MZ of the Open Pit can then be made available to store tailings (in Year 18), while extraction continues within the EZ of the Open Pit.

The MZ will be the primary supply of ore, providing approximately 843 Mt of ore for processing. The ultimate dimensions of the MZ will be approximately 3,400 m by 1,700 m with a depth of 690 m below grade. Full development of the MZ will require the realignment of Highway 655, which is scheduled to be completed following the start of operations (refer to Section 4 for additional details on Project phasing).

The EZ will initially provide materials that will be used for Project construction. Slightly larger than the MZ, the EZ will provide approximately 863 Mt of additional ore for processing. The ultimate dimensions of the EZ Pit will be approximately 3,800 m by 1,500 m, with a depth of 615 m below grade.

The Open Pit will employ two bench heights. To a depth of 90 m below surface, which is the maximum depth of overburden, the bench height will be 7.5 m. Below this horizon, material will be rock, and benches will be 15 m.

Figure A.4 (Appendix A) provides an illustration of the Open Pit configuration at the end of mine life (approximately Year 30).

Over the course of the open pit development and ore extraction, three different sized mine fleets will be employed based on ground conditions and will be employed at different levels within the Open Pit. Fleet 1 will be composed of lighter duty equipment (e.g., 120 tonne [t] backhoe and 40 t articulated trucks) that are better suited to softer ground conditions. Fleet 2 will be composed of heavier duty equipment (e.g., 300 t front shovels excavators and 90 t trucks) better suited for operation in sand and till soils. Fleet 3 will comprise the heaviest and largest equipment (e.g., 700 t front shovel/rope shovel excavators and 290 t trucks). A trolley assist system will be implemented, and autonomous and remotely controlled electric machinery is being explored, to support all or components of the mining fleet, particularly for Fleets 2 and 3, for the main mining operations.

4.1.1 Open Pit Water Management

Water reporting to the Open Pit, including groundwater and precipitation (surface water runoff) from its footprint and immediate adjacent area, will be dewatered via staged pumping and will report to the TMF Northwest Collection Pond for process water reclaim or treated/released to the environment. A large sump (approximately 400,000 m³), cut into the lower benches of the pit, will be required to provide additional water storage capacity from the surface ponds in the event of upset conditions or a larger storm event (i.e., up to a 100-year, 24-hour storm event). The MZ is anticipated to be mined out by Year 17 and will begin to be infilled with tailings in Year 18.

Pit dewatering will continue up until Year 30 when the EZ will no longer be actively mined. At this stage, dewatering will only occur as required to satisfy process water requirements. Once milling/processing operations cease at the end of the mine life, no active inflows or outflows will occur (i.e., Open Pit will be influenced by precipitation and groundwater only).

4.2 Tailings Management Facility

The TMF will be located to the south of the Open Pit and has been designed to hold 495 million cubic metres (Mm³) of tailings covering an area of 2,300 ha with an ultimate dam height of 23 m.

4.2.1 Dam Design and Safety

Prior to tailings production (Year -1), excavation of the TMF downstream toe ditches and construction of the adjacent access roads and the TMF Northwest Collection Pond will be completed.

At the start of operations, approximately 100 Mm³ tailings will be deposited into the central areas of the TMF and the construction of the TMF dams will not be immediately required to achieve containment.

Construction of the starter dam will commence in Year 4 of operations and the dam will be progressively raised as the volume of tailings increases using the centreline method, whereby the dam will be raised vertically with both upstream and downstream shells being raised. The perimeter dam will include a clay core, filter, and transition zones, downstream and upstream shells. The clay core will be covered by a layer of frost protection material (sand) to insulate the core and reduce potential for degradation from freeze-thaw action. Rip-rap erosion protection will be provided over the exposed sand slopes of the frost protection and upstream shell. Based on current feasibility study level design, the downstream (exterior) approach will be sloped at 12:1, while the upstream (interior) approach will be sloped at 3:1. The ultimate dam height will vary from 9 to 23 m. A typical cross-section of the TMF dam is illustrated on Figure A.5 (Appendix A). A perimeter road will also be constructed around the TMF for access and maintenance (WSP 2023).

The TMF dam will be designed in accordance with the Canadian Dam Association (CDA) Dam Safety Guidelines (CDA 2013) and will be designed to accommodate the recommended seismic exceedance probability and inflow design flood according to the expected hazard potential classification. Installation of vibrating wire piezometers (VWPs) is proposed to monitor the excess pore water pressure within the wick

drain area and the rest of the clay foundation. Installation of slope inclinometers is also proposed to monitor the slope movements within the dams (WSP 2023).

An Operations, Maintenance and Surveillance (OMS) manual will be developed, and followed, in accordance with the recommendations of the Mining Association of Canada Guide to the Management of Tailings Facilities (Mining Association of Canada 2011).

4.2.2 Tailings Quality and Delivery

Tailings will be thickened in the mill to approximately 39% solids prior to being pumped via a High Density Polyethylene (HDPE) line to the TMF and deposited near the centre of the facility allowing for a steeper beach slope. This method of deposition known as a “thickened tailings cone” will increase the TMF storage capacity while limiting the perimeter dam height. The final tailings form will consist of a central ridge trending north-south through the centre of the TMF (WSP 2023). Tailings will be deposited into a surface TMF until Year 17 of operations at which time they will be deposited into the MZ of the Open Pit (Years 18 to 29) and then later into the EZ of the Open Pit (Years 30 to 41).

4.2.3 TMF Water Management

Water from the TMF (runoff and decanted process/tailings water) is collected in two ponds, the Northwest Collection Pond and Northeast Collection Pond, which are adjacent to the TMF. The Northwest Collection Pond will receive half of the water from the TMF along with dewatered flows from pit operations. Water required for processing and mill operations will be sent back to the Process Plant by a pumping system in order to recycle tailings decant water and to supply water process demands. Excess water remaining will be treated via a modular water treatment plant prior to being discharged to the environment (Ausenco 2024).

The Northeast Collection Pond will receive half of the water from the TMF. This water will be pumped to the Northwest Collection Pond for reclaim or treatment (Ausenco 2024).

4.2.4 Seepage Collection System

Seepage through the TMF perimeter dam will be controlled by a low permeability core. Seepage and runoff from the downstream shell of the dam will be collected in perimeter contact water channels and directed to the TMF collection ponds (Ausenco 2024).

4.3 Impoundment Facility

To manage the segregation and storage of rock, clay, sand and till, a large impoundment facility will be constructed north of the Open Pit. Segregation and storage of materials in stockpiles will allow for appropriate water management and environmental monitoring, as well as future reclamation of the Project following operations. The approximate characteristics of the primary stockpiles are provided in Table 4.1.

The clay impoundment will be surrounded on all sides by a perimeter rock berm. A series of rib berms will also be constructed from rock, spaced at a nominal 200 m, within the clay impoundment to contain and to provide haulage access to the interior of the clay impoundment.

The bases and perimeter ditches around the Impoundment Facility will be constructed of low-permeability fill materials to assist in drainage control. As areas of the facility are no longer disturbed by material placement, overburden will be placed, and vegetation applied. The facility will be constructed in a series of lifts as the volume of storage needs increase over the life of the mine.

Additional overburden and organics stripped during construction will be stockpiled at various locations within the PA to be used for future reclamation.

Table 4.1 Stockpile Characteristics

Stockpile	Surface Area (ha)	Height (m)	Capacity/Anticipate Volume (Mm ³)	Slope (Horizontal:Vertical [H:V])
Impoundment Facility				
Rock Impoundment	1,801	115	1,438	
Sand and Till Impoundment	252	50	182	6:1
Clay Impoundment	1,078	34	205	2:1 (internal slope) 6:1 (external slope)

4.4 Ore Processing Components

To support ore processing, several buildings and infrastructure will need to be constructed or installed including:

- Primary and Secondary Crushers
- Process Plants
- Concentrate load-out buildings

These Project components are centrally located between the Open Pit and the TMF within the Process Plant Area (Figure A.2, Appendix A). The design of the Process Plants and associated infrastructure is a two-stage design to support an increase in processing from 60,000 tpd during the first four years of production to 120,000 tpd for LOM operations. Further detail can be found in Sections 4.4.1 to 4.4.5.

Two sets of facilities will be constructed to serve two separate yet attached Process Plants in order to increase output (See Section 4.4.1 for further details). Table 4.2 provides the approximate dimensions of the proposed processing infrastructure.

Table 4.2 Characteristics of the Process Plant Area Buildings

Building Name	Preliminary Building Dimensions		
	Length (m)	Width (m)	Height (m)
Primary Crusher	23	13	30
Secondary Crusher	34	34	39
Process Plants	288	88	35
Concentrate Loadout Building	79	100	12

4.4.1 Process Plant Infrastructure

Two identical Process Plant buildings will be constructed for the Project, the first during operations phase 1 and the second during operations phase 2 (refer to Section 4 for Project phasing).

The Process Plant building will consist of a pre-engineered rigid frame metal building and its interior components will be supported on a reinforced concrete pile cap and steel piles down to bedrock. The pile cap will also serve as the flooring in the building. The building will house the grinding and chemical processing facilities, including the semi-autogenous (SAG) mill, primary and secondary ball mills, regrind mills, thickeners, coarse flotation cells, fine flotation cells, reagents, and access and operating platforms.

Two identical Concentrate Load-out Bays will be constructed, the first during operations phase 1 and the second during operations phase 2. These will be attached to the Process Plant building and will be used to store nickel and magnetite concentrates prior to it being sold and shipped by rail.

The Process Plant is designed to recover a nickel flotation concentrate and a magnetite concentrate. Cobalt, platinum, and palladium are to be recovered in the nickel concentrate, and chromium would be recovered in the magnetite concentrate as well. The conceptual ore milling process is illustrated on Figure 4.1 within Appendix K (Water Quality Assessment) of the Impact Statement.

Over the LOM, 8.5 Mt of nickel concentrate and over 100 Mt of magnetite concentrate will be produced.

4.4.2 Ore Processing

Ore processing has been designed to recover a nickel flotation concentrate, including cobalt, platinum, and palladium therein, and a magnetite concentrate. The Process Plant will be separated into five major areas: comminution and desliming, coarse/fine nickel flotation, magnetic separation, concentrate thickening/filtration, and tailings processing.

The Process Plant includes two-stage crushing and stockpiling. The ore is reclaimed into a grinding circuit consisting of a SAG mill and a ball mill circuit operating in closed circuit with a cyclone cluster. The cyclone overflow is deslimed in a cyclone cluster, following which overflow reports to tailings and underflow to coarse rougher and cleaner flotation stages. The first cleaner concentrate is regrind in a dedicated regrind mill for further size reduction prior to subsequent cleaner flotation for upgrading.

Coarse flotation tailings are ground in a closed-circuit ball mill and deslimed before fines rougher and cleaner flotation stages. The first cleaner concentrate is also reground before subsequent cleaning stages. Both flotation concentrates report to a common thickener and filter for dewatering before stockpiling. The fines flotation tailings are further processed through three stages of magnetic separation, with a dedicated regrind mill for further size reduction between the stages. The magnetic concentrate is processed through a sulphide flotation stage, dewatered, and filtered before stockpiling. Tailings from the magnetic separation process are combined with the deslime cyclone overflows and thickened. The thickened tailings are then pumped through tanks, where carbon dioxide is introduced for capture and sequestration in the TMF.

- Primary and secondary crushing: ROM or stockpiled ore is delivered to the primary crushing area, which is composed of a hopper, primary gyratory crusher, mobile rock breaker, and apron feeder/sacrificial conveyor system. The sacrificial conveyor system directs crusher product to the secondary screen feed conveyor and surge bin, which feeds two identical open circuit secondary screening/crushing streams. Crushed ore bypasses the surge bin to a stockpile feed conveyor via a bypass chute. Within each secondary screening/crushing stream, product is screened by 90 millimetre (mm) top deck and 38 mm bottom deck apertures, which permits undersize deposits to be transferred to the stockpile feed conveyor. Oversize deposits are directed into a cone crusher and crusher product is then deposited onto the stockpile feed conveyor.
- Crushed ore stockpile and reclaim: The crushed ore stockpile has a storage capacity of 32,860 t, which is equivalent to 12 hours of mill feed at the nominal mill feed rate. To mitigate potential freezing of the stockpiled material and fugitive dust emissions, the stockpile will be a covered facility. Three variable-speed apron feeders will reclaim ore from the stockpile.
- Primary grinding and classification: The closed-circuit primary grinding circuit includes a SAG mill, ball mill, and cyclone cluster, following which ball mill cyclone overflow is deslimed. Overflow produced from the primary grinding circuit is combined and directed to the final tailings thickener, while underflow is sent to coarse flotation. To maintain mill charge volume and power draws, steel balls are added to the mills. Similarly, process water is added to maintain a target slurry density of 65% solids.
- Coarse flotation and regrind: Major equipment in this process step includes rougher forced air flotation cells, first, second, and third cleaner forced air flotation cells, and a regrind ball mill. Tailings from the rougher and first cleaning stages are combined and directed to secondary milling for further recovery in the fines flotation circuit. The third cleaner concentrate is sent to the nickel concentrate thickener, while tailings are recycled back to the second cleaner bank.
- Secondary grinding and classification: The secondary grinding circuit consists of a ball mill and cyclone cluster arranged in a closed circuit, followed by deslime. The purpose of the secondary grinding circuit is to reduce coarse flotation tailings to a specified passing size and remove fibrous particles prior to fines flotation. Overflow produced from this step is sent to the final tailings thickener, while underflow is sent to fines flotation.
- Fines flotation and regrind: Underflow from the previous step's secondary deslime cyclone is fed to rougher conditioning tanks, after which conditioned slurry is transferred to flotation cells for rougher flotation. Finer rougher concentrate is pumped to flotation cells at the first cleaning stage,

while tailings are pumped to the magnetic separation circuits for magnetic concentrate recovery. First cleaner concentrate is pumped to the fines regrind circuit and regrind cyclone overflow is sent to a second fines cleaner flotation stage. Tailings from this stage are recycled back to the first coarse cleaner cells, while concentrate is pumped to the third cleaner stage. Third cleaner concentrate is sent to the nickel concentrate thickener, while tailings are recycled back to the second cleaner bank.

- **Magnetic separation with regrind:** A three-stage low-intensity magnetic separation circuit recovers nickel in magnetic allows within the fines rougher flotation tailings. Fines rougher tailings are distributed to two rougher magnetic separators, where concentrate flows to a pumpbox and is delivered to the secondary regrind circuit. An open-circuit regrind stage is used to grind the rougher magnetic concentrate stream to a product size of 80% passing (P80) of 60 μm . The concentrate is pumped to a cyclone where the underflow feeds the vertical stirred magnetic secondary regrind mill. The open-circuit tertiary regrind vertical stirred mill reduces the secondary magnetic separation concentrate to a product size of 80% passing (P80) of 25 micrometres (μm). The magnetic tertiary regrind product is then pumped to a train of four triple-drum tertiary magnetic separators (3.05 m long x 1.2 m diameter), fed via a feed distributor. The tertiary magnetic separation concentrate is pumped to a bank of conventional flotation cells where the collector and frother are dosed for sulphide flotation. The sulphide flotation concentrate is then pumped to the magnetic concentrate dewatering stage.
- **Concentrate dewatering:** Both coarse and fines nickel concentrate from the third cleaner flotation is combined and screened into the nickel concentrate thickener to be processed to approximately 50% solids. Thickened underflow is further dewatered in a filter press before stockpiling. Magnetic concentrate is dewatered through magnetic separators and two filter press streams before stockpiling. Filtered concentrates are stockpiled and prepared for loadout to market.
- **Carbon sequestration and tailings disposal:** Deslime cyclone overflows and magnetic separation tailings are combined and thickened, and the resulting slurry is pumped into three carbon-capture streams, where the slurry undergoes carbon capture and sequestration using carbon dioxide gas. Tailings from all three streams are pumped to the TMF for long-term storage, while process water released from consolidation of tailings in the facility is recycled.

Recycled water recovered from the thickener overflows, magnetic concentrate dewatering, and supernatant from the consolidated tailings facility will be primarily used as process water. Fresh water will be added as necessary to make up the deficit. Anticipated process water usage is approximately 423,054 m^3 per day.

4.4.3 Ore Stockpiles

During operations phases 1 and 2, ore will be mined at a faster rate than it can be processed. As such, ore of lower value will be stockpiled for processing at a later date, predominately during operations phase 3 or when ore extraction temporarily needs to stop (i.e., during equipment maintenance). Two ore stockpiles will be developed on the east and west sides of the Open Pit. The stockpiles will be raised in horizontal lifts.

The East Stockpile will be started during the construction phase and will have a maximum design height of 100 m in Year 20 during operations phase 2 with an average height of 50 m. At its peak, the East Stockpile will have a storage volume of approximately 100 Mm³ and will occupy approximately 253 ha.

Development of the West Stockpile will begin during commissioning of the mill expansion during Phase 2 of operations. The current design for the stockpile has its peak height at 70 m and averages 30 m high over its 37-year active life. At its peak, the storage volume will be approximately 165 Mm³, occupying approximately 439 ha.

Perimeter ditching to collect and manage contact water and access roads will be constructed around the stockpiles.

4.4.4 Crusher Facilities

Two identical Primary Crusher Buildings will be constructed to support ore processing, the first during Phase 1 and the second during Phase 2. Each building will consist of a buried concrete vault complete with a stick-built crane-supporting superstructure. The building will house the primary crushing plant, including the ROM bin, rock breaker, primary crusher, apron feeder, conveyor, dust collector, access platforms, and support structures. The ROM bin will be able to hold enough ore to supply the Process Plant with 60 kt/d.

Each of the two buildings and its interior components will be supported on a reinforced concrete raft foundation on bedrock 30 m below finished grade. The raft foundation will also serve as the flooring in the building.

Two identical Secondary Crusher Buildings will be constructed to support ore processing. Each building and its interior components will be supported on a reinforced concrete pile cap and steel piles down to bedrock. The pile cap will also serve as the flooring in the building.

All crushing facilities will be equipped with adequate heating, ventilation and air-conditioning (HVAC), lighting, dust collection, and an overhead crane.

A 3 km Stockpile Feed Conveyor will connect the Phase 1 Secondary Crusher Building to the Crushed Ore Stockpile.

4.4.5 Crushed Ore Stockpiles

ROM will be established adjacent to each of the Process Plants. These stockpiles will be housed in a geodesic dome to protect the piles from the elements, as well as reduce dust emissions. The stockpiles will store ore that has been through the crushing process with the intent of holding enough ore to allow the process plant to process 60 kt/d. The dome covering the stockpile will be approximately 108 m in diameter with a height of 44 m.

4.5 Mining Infrastructure

Several buildings and other facilities will be required to support the mining operation, including the maintenance and repair of equipment, storage and inventory of parts and tools, magazine storage, and other administrative activities. These buildings and facilities will be centrally located between the Open Pit and TMF in proximity to the Process Plants (Figure A.2, Appendix A).

4.5.1 Potable Water Supply

Potable water for the Project will be supplied by groundwater wells located southwest of the Process Plant and TMF. Potable water will be transferred to buildings via HDPE pipes, which will be insulated and heat-traced when run outside. Potable water will be treated to meet ODWQS.

4.5.2 Ancillary Buildings

A series of buildings will be constructed between the Open Pit and TMF to house a workshop (including wash station), warehouse, offices, medical building and firehall, and assay lab. Additional ancillary buildings may also be located within this area, as needed. This area has been identified as the Process Plant Area (Figure A.2, Appendix A) and the exact locations of ancillary buildings may shift within this area as design progresses. A gate house will be constructed at the entrance located immediately southwest of the Process Plant.

The workshop will be constructed on reinforced concrete and steel piles given the heavy weight load. The warehouse will be a fabric structure that is supported by shipping containers. All other buildings will be pre-engineered or modular structures placed on pre-cast concrete.

4.5.3 Explosives Storage

The technology under consideration for the Project would result in explosives only being sensitized (i.e., prior to sensitizing, the product is inert) when injected with a gassing agent in the bulk delivery truck used to charge the holes.

During construction, bulk explosives products will be trucked to the Project and stored in an explosives storage facility (e.g., magazines) proposed on the west side of Martin Lake and Gerry Lake. Materials used for explosives will be stored in an inert state (i.e., prior to being injected with a gassing agent), with two magazines erected for the separate storage of boosters and detonators. Storage facilities totalling 70 t capacity would be erected, providing at least four days' supply.

Canada Nickel will provide an explosives pad for the construction of the explosives facility for the mixing of the inert materials to be sensitized. The main ingredient is ammonium nitrate solution (ANSOL), which is non-explosive and can be delivered by larger trucks, with a capacity of 38 t. At the peak production rate, explosives demand would be 151 t/d or approximately four truckloads daily.

The transportation and storage of explosive products and the location of the storage facility will be conducted in accordance with the Federal *Explosives Act*.

4.5.4 Fuel Farm

A fuel farm will be located between the Open Pit and the TMF, within the Process Plant Area near the workshop. The exact locations of the fuel farm may shift within the Process Plant Area as design progresses. The fuel farm will be composed of fuel tanks, fuelling stations, and containment infrastructure. The fuel farm will initially be set up with four diesel tanks, one gasoline tank and one Diesel Exhaust Fluid (DEF) tank during the initial stages of construction. Storage needs would increase to 13 diesel fuel tanks being required (at Year 16). It is anticipated that each tank will have a capacity of 80 m³. Fuel requirements will vary over the life of the Project, but it is anticipated that peak demand will be in Year 16 with just under 125,000 m³ of diesel being consumed annually.

All fuel tanks will be located within a containment area sized to contain the contents of the fuel farm in the event of a spill. Tanks will be installed on a concrete pad to facilitate clean up and reduce potential contamination of soil and groundwater.

4.5.5 Access and Internal Roads

During construction, access to the site will be via the existing Lower Sturgeon Dam Road and other access roads from Highway 655. To permit access between the Primary Crusher and the Process Plant site prior to the realignment of Highway 655, an overpass will be constructed. This will include the construction of an overpass structure that will allow road access between the Primary Crusher and the Process Plant, above a temporary by-pass of Highway 655 (two lanes wide and approximately 2,700 m long).

As noted, full development of the Main Zone of the Open Pit will require the realignment of Highway 655. See Section 4.8 for details on the Highway 655 realignment. Once Highway 655 has been re-aligned, site access will be provided from Highway 655 easterly to the mine buildings. In general, this access will be 3.5 km long and will run from the re-aligned Highway 655 to the Process Plant and then in line with the conveyor to the mine buildings (e.g., offices, warehouse, workshop).

A series of internal haul and access roads will be constructed to facilitate access to various Project components. Over the life of the Project, approximately 45 km of surface internal roads will be constructed. Haul roads will be 35 m wide, with the exception on the pit ramps that will be 50 m. All other roads will be 15 m wide. Roads will be constructed of mine rock or aggregate. Culverts and bridges will be located where the internal haul and access roads are proposed to cross ditches/diversions and existing watercourses. Watercourse crossings will be designed in accordance with applicable standards and regulatory requirements.

The location of access and haul roads are shown on Figure A.2 (Appendix A). Additional internal roads within, around, and between Project components will also be constructed within the PA to provide access for maintenance and monitoring.

4.5.6 Power Supply and Distribution

Canada Nickel will construct and operate two substations that will be located near the Process Plant. These substations will have an estimated demand and operating load of 230 kV and 34.5 kV, respectively, and will be built separately in operations phase 1 and 2. These will connect to a 230 kV transmission line to be constructed and operated by others¹. A network of 34.5 kV overhead lines (totaling approximately 69 km) and 4.16 kV circuits will distribute power around the site.

In addition to the overhead lines that will power supply to various Project components, trolley-assist infrastructure will be installed along pit ramps. This infrastructure will consist of an overhead power line on rigid poles connected to a direct current substation. These power lines will transfer electricity to truck-mounted pantographs powering the vehicles. Trolley-assist infrastructure is intended to reduce dependence on diesel and improve the efficiency of trucks to climb out of the Open Pit. Trolley-assist will be installed along pit ramps to provide electrical power to assist trucks in climbing out of the Open Pit.

During construction and decommissioning and closure, power will be supplied using diesel generators. A total of 20 diesel generators (10 for each Process Plant) ranging in size from 150 to 1,250 kilowatts (kW) are anticipated. Generators will also be used to provide standby power in emergency situations. Each diesel generator will be contained within a weatherproof enclosure and will include a neutral ground resistor.

4.6 Water Management

Surface water runoff that comes into contact with disturbed areas of the mine (contact water) will require management prior to its release to the receiving environment. The overall water management strategy for the PA aims to accomplish the following:

- balance treated effluent discharge flows to local receivers to the extent feasible
- reduce potential flood effects to local receivers by controlling Project flooding and attenuating effluent discharge
- reduce water quality impacts on receivers by providing mine water sedimentation control and treatment
- reduce erosion and sedimentation with appropriate controls

¹ A future 230 kV transmission line is being designed, constructed and operated by a fully independent business, which is a jointly owned venture between Transmission Infrastructure Partnerships Limited and Taykwa Tagamou Nation. The 230 kV transmission line is part of an independent transmission expansion project that is expected to promote stronger electricity reliability for northern communities and Indigenous nations that will connect the Porcupine Substation in Timmins. It is anticipated that the transmission line will follow the realigned Highway 655. A Transmission Facilities Class EA was initiated by others for that project in 2023.

- maintain existing flows to the receivers to the extent possible
- reduce contact water as much as possible by incorporating non-contact surface water/overland flow diversion
- provide water for mining operations (milling supply water and dust suppression), including reuse of collected water to the extent feasible

The five major Project infrastructure areas that require water management consist of the following:

- EZ and MZ of the Open Pit
- Impoundment Facility
- East and West Ore Stockpiles
- Process Plant and Ancillary Building Area
- TMF

To achieve this management strategy, Canada Nickel has developed a Site-Wide Water Management Plan (Appendix J of the Impact Statement), with accompanying site wide Mine Water Balance (Appendix I of the Impact Statement). The Plan includes five surface water management ponds, with associated collection channels, spillways, pumping systems, and water treatment plants to manage contact water. The general site-wide water management strategy is shown on Figure 4.1 of Appendix K of the Impact Statement.

A 100-year, 24-hour storm event will be internally managed through pond storage and controlled release to the Open Pit from all contact areas. All collection ditches have been sized to convey the design storm with freeboard considerations. Ponds will have spillways directed toward the Open Pit that will convey flows for events up to the 100-year, 24-hour storm. In the event of an extreme flood event (i.e., in excess of a 100-year event) the ponds will have secondary emergency overflow spillways to direct flow to the receiving environment in a controlled manner.

4.6.1 Collection Ponds

Five water management ponds with associated conveyance ditches, emergency spillways, pumps, and erosion protection will be constructed to manage contact water. The inspection and monitoring process for each collection pond will be included in the Project's OMS Manual. Each pond will be sized to remove particles above 10 µm through conventional settling, and erosion and sediment controls will be included in the design. While these are still being developed, it is envisioned that these will consist of typical best management practices such as check dams and scarifying (Ausenco 2024). Details on each water management pond are provided below and are summarized in Table 4.4. Water treatment requirements are identified in Section 4.6.3.

Pond 1

Contact water will be conveyed via gravity channels to collection ponds. Pond 1 will be constructed in conjunction with the east segment of the Impoundment Facility to manage runoff and seepage collection from that facility. Pond 1 is a wet pond and will discharge water to the environment following treatment.

Pond 2

Once the Highway 655 realignment is completed, Pond 2 will be constructed to manage runoff from the western portion of the Impoundment Facility. Pond 2 will also manage contact water from the West Stockpile and the Process Plant Area. Pond 2 is a wet pond and will discharge water to the environment following treatment.

Pond 3

Contact water from the East Stockpile will be collected in perimeter ditches and conveyed to Pond 3. Due to topographic constraints, capturing runoff from the entire stockpile into a single pond utilizing gravity is not feasible. An excavated sump at the southwest corner of the East Stockpile will be required to capture runoff from a portion of the facility. A pumping system will convey accumulation runoff to Pond 3 for treatment.

Northeast Collection Pond (TMF)

Contact and seepage collection water from the TMF will report to the TMF Northeast Collection Pond where it will be pumped to the Process Plant to be used as process water. Surplus water within the collection pond will be treated through a water treatment plant prior to being discharged to the environment.

Northwest Collection Pond (TMF)

The Northwest Collection Pond will receive half of the water from the TMF (contact and seepage) along with dewatered flows from pit operations. Water required for processing/mill operations will be sent back to the Process Plant by a pumping system in order to recycle tailings decant water and to supply water process demands. Excess water remaining will be treated via modular treatment plants prior to being discharged to the environment.

Table 4.3 Pond Configurations and Parameters

Pond	Side Slopes (H:1V)	Length (m)	Width (m)	Design Depth (m)	Approx Volume (m³)	Permanent Water Depth (m)	Discharge Watershed
Temporary Construction Pond	5:1	400	170	5	300K	1.5	North Driftwood
Pond 1	5:1	1500	300	6	3.05M	2	West Buskegau
Pond 2	5:1	1500	300	6	3.24M	2	North Driftwood
Pond 3	5:1	500	100	6	240K	2	West Buskegau
Pond 3 Sump	5:1	200	80	5	80K	2	West Buskegau

Pond	Side Slopes (H:1V)	Length (m)	Width (m)	Design Depth (m)	Approx Volume (m ³)	Permanent Water Depth (m)	Discharge Watershed
TMF Northeast Collection Pond	6:1	700	600	6.8	2.8M	0	North Driftwood
TMF Northwest Collection Pond	6:1	1400	200	6.8	1.9M	0	North Driftwood

4.6.2 Collection Ditches

Surface water runoff that comes into contact with disturbed areas of the mine (contact water) will require management prior to release to the receiving environment. Collection ditches will capture contact water from the Impoundment Facility, East and West Stockpiles, TMF, and the Process Plant Area and convey it to the settling ponds discussed in Section 4.6.1 and as shown on Figure 4.1 of Appendix K of the Impact Statement. Open Pit groundwater and surface runoff from haul roads and the pits will be pumped to the TMF Northwest and Northeast Collection Ponds. As per mining best practice, perimeter collection ditching will be constructed to intercept shallow groundwater seepage at the toe of stockpiles and dams (Ausenco 2024).

Non-contact water will be diverted around mine infrastructure to reduce the amount of water needing to be managed and to maintain existing flow to the adjacent watercourses to the extent possible.

4.6.3 Water Treatment

Details of the treatment technologies and sampling methodologies to be used to test and treat contact water will be determined during detailed Project design.

Effluent will be treated prior to discharge to the receiving environment, as required, to meet regulatory effluent criteria as well as criteria developed through the receiving watercourse Assimilative Capacity Assessment (Appendix G of the Surface Water Resources Assessment [Appendix C.5 of the Impact Statement]).

A water treatment plant will receive discharge from the tailings pond and use proven processes to treat the water to meet regulatory effluent criteria prior to discharge to the environment

4.6.4 Sewage Treatment

Domestic sewage generated during the construction and operating phases will be treated by an appropriately sized, technically acceptable method, such as a sewage treatment plant, or in case the conditions allow it, a septic system. The location of the domestic sewage treatment system(s) will be identified as design progresses, however the system(s) will be located within the PA.

Temporary sewage facilities will be used during construction, and potentially in the closure phase. These facilities may include disposal offsite or a temporary sewage treatment system that will be located within the PA.

4.6.5 Non-Contact Water Diversion

Non-contact water will be managed separately from contact water to reduce the quantity of water requiring treatment and to maintain natural flows to the extent possible. To achieve this, a series of non-contact water diversions will be installed around the perimeter of mine disturbance to divert flows away from Project components. These diversions will collect natural drainage otherwise destined for the mine and will convey flows to downstream receiving waterbodies. The largest diversion of non-contact water will be in the North Driftwood Diversion Channel. A reach of the North Driftwood River flows through the area proposed to be overprinted by the Open Pit and other mine infrastructure. As such, a diversion of the North Driftwood River is proposed to redirect existing flows away from the Open Pit.

4.7 Aggregate Sources

There are numerous potential sources for the construction aggregate that will be required during Project construction; however, aggregate sources for construction material are still being evaluated. If suitable aggregate is located within the PA, applicable permits under the *Aggregate Resources Act* will be sought, which will include proposed rehabilitation methods. Otherwise, aggregate will be sourced from other third-party licensed pits and imported onto the site.

4.8 Ancillary Facilities and Infrastructure Outside Care and Control of Canada Nickel

There are several components and activities that are ancillary to the Project and are outside of the care and control of Canada Nickel. These ancillary components will be operated by others. These ancillary components include:

- rail spur line connecting the process plant to the existing Ontario Northland Railway spur line at the Kidd Mine owned, operated and maintained by Ontario Northland
- re-aligned segment of Highway 655 owned, operated, and maintained by the Ontario Ministry of Transportation (MTO)

5 Progressive Rehabilitation

Progressive rehabilitation will be completed throughout all three operations phases with the objectives of:

- informing design and planning for final rehabilitation and closure
- testing rehabilitation methods (where possible)
- stabilizing Project components as they reach completion to meet end land use objectives
- reducing the long-term liabilities associated with the Project and thereby reducing the required value of financial assurance

Progressive rehabilitation activities will include:

- removal of construction-related buildings and rehabilitation of laydown areas and access roads used during construction
- progressive reclamation of waste rock, clay and sand and till piles within the Impoundment Facility
- rehabilitation of the TMF upon completion of deposition after Year 17 of operations
- implementation of water treatment units to treat seepage and runoff from Impoundment Facility, East and West Stockpiles, Process Plant Area, and the TMF
- milling of remaining ore from the East and West Stockpiles
- stabilization and revegetation of disturbed areas from construction no longer required
- conducting test plot studies
- removal of hazardous and non-hazardous waste materials where possible on a regular basis

The anticipated schedule for progressive rehabilitation activities will be provided in the Mine Development Closure Plan submitted to MINES.

The following sections provide a summary of the anticipated progressive rehabilitation efforts that will be completed during operations.

5.1 Open Pit

The current design and sequence of the Open Pit allows for in-pit impoundment of tailings, thus limiting the size of a TMF and associated environmental impacts. This sequence allows in-pit deposition of tailings to commence in the MZ after it is depleted of ore in Year 17. From operations Years 18 to 29, tailings will be deposited in the MZ. Decanted tailings water will continue to be reclaimed for ore processing purposes (decanted from the MZ of the Open Pit rather than a pond). Dewatering of the EZ of the Open Pit will continue and will report to the process plant as make-up water or be pumped to the Northwest Collection Pond for treatment prior to release to the environment. Mining of the EZ of the Open Pit will continue until Year 30 of operations at which point dewatering of the Open Pit will cease, except

for water required for ore processing operations of the East and West stockpiles. Tailings deposition from Years 30 to 41 will continue in the EZ of the Open Pit (Ausenco 2024).

Approximately 779 Mm³ of tailings are anticipated to be placed in the Open Pit during operations, will which remain approximately 30 m below the top of bedrock. The tailings placed in the Open Pit are predicted to be NPAG. Monitoring of water quality within the Open Pit during filling will be completed to assess the potential discharge water quality and to determine if water treatment could be required until water quality meets the appropriate criteria. Over the LOM, 61% of total tailings production will be deposited in-pit and ultimately covered with water (Ausenco 2024).

5.2 Tailings Management Facility

During Year 18 of operations, tailings deposition will be switched from the TMF to the MZ of the Open Pit and progressive rehabilitation of the TMF will commence. The proposed timeline for rehabilitation is 5 years.

The top surface of the TMF will be covered with 0.15 m of overburden and/or organic soil cover and revegetated to improve aesthetics, reduce the potential for surface erosion, and reduce the interaction between surface runoff and the tailings surface. The Crawford Geochemical Characterization is provided in Appendix H of the Impact Statement and water quality modelling is detailed in Appendix K of the Impact Statement.

An integral part of the soil cover will be the vegetation (grasses). The surface of the TMF will be seeded to develop a vegetated cover to improve aesthetics, reduce the potential for surface erosion, and reduce the interaction between surface runoff and the tailings surface. Consideration will be given for future land use such as Indigenous traditional land use. As described in Section 5.8, soil tests and test plots will be carried out to confirm the most appropriate seed mixture as well as to identify requirements for mulching and fertilization. Monitoring will be completed to evaluate cover performance, including vegetation establishment and water quality performance.

The TMF dams will be constructed of waste rock, which has very low susceptibility to dust and surface erosion. As such, the establishment of a vegetative cover over the dam slopes is not planned and would be difficult to achieve due to the coarse-grained nature of the material.

Initially, a water treatment plant will treat seepage prior to discharging to the North Driftwood River and/or West Buskegau River. As the TMF is reclaimed and vegetated, elevated TSS will begin to stabilize. At this stage, a 5-year reclamation timeline has been assumed at which time water quality will be suitable for direct discharge. Internal ditches will be constructed to convey runoff from the eastern side of the TMF towards the west and runoff from the TMF will report to the North Driftwood River.

Further detail related to the reclamation of ponds and collection ditches will be established through the creation of the Mine Development Closure Plan. Consideration has been given to establishing wetlands (see Section 5.6).

5.3 Impoundment Facility

Progressive rehabilitation of the Impoundment Facility will commence during operations at various intervals as Project development allows. During the first five years of active closure, a final 0.15 m of overburden cover will be applied to impoundment slopes and appropriate vegetation will be established. Performance will be monitored throughout the progressive rehabilitation trials and adjustments will be made to the design, as necessary. The objective will be to create caribou habitat through reforestation of coniferous trees.

5.4 Ore Stockpiles

The East and West Stockpiles consisting of lower value ore will be developed in early operations, as ore will be produced at a faster rate than the mill throughput will allow. Lower value ore will pass through the mill at various times throughout operations. Near the end of operations, remaining lower value ore will be processed and the former stockpile pads will be graded, covered with overburden, and revegetated.

5.5 Construction-Related Mine Infrastructure

Upon completion of construction, temporary buildings and trailer units will be removed from the PA. Laydown areas and access roads established during construction that are no longer required for operation will be removed and foundations will be demolished to grade. Efforts will be made to promote the reuse of building materials, where possible, and building materials that cannot be reused will be recycled or disposed of in accordance with a Waste Management Plan and applicable regulatory requirements. A Waste Management Plan will be developed for the Project that will outline appropriate disposal methods.

Appropriate testing will be completed to confirm soil conditions are appropriate for the intended land use and required remediation of affected soils will be completed, if required, in accordance with the Soil Management Plan developed for the Project and applicable regulations. The areas will be stabilized to limit potential for erosion and rehabilitated to a condition appropriate for the intended land use. Areas that are to be revegetated will be covered with the appropriate growth media before seeding. Sections 5.7 and 6.2.7 present conceptual level details for the revegetation of disturbed areas.

5.6 Water Management

Contact water management ponds and collection ditches will be progressively rehabilitated following the commencement of tailings deposition in the TMF. In operations Year 18, tailings deposition will cease in the TMF and begin in the MZ of the Open Pit. During the assumed five years required for the TMF to be rehabilitated and water quality to be stabilized, the TMF Northeast Collection Pond will no longer receive inflow from mining operations and will be naturalized. A spillway will be constructed to direct flow east toward the West Buskegau River. If seepage treatment is required, a passive treatment system will be implemented (Ausenco 2024).

In operations Year 30, mining of the EZ of the Open Pit will cease along with pit dewatering, except for water required for ore processing operations of the East and West Stockpiles. Accordingly, the Northwest Collection Pond will be naturalized and a spillway constructed diverting flow west towards the North Driftwood River.

Following operations Year 30 and the completion of rehabilitation of the Impoundment Facility, collection ditches in the southern part of the Project will remain active to divert flow away from the Open Pit and will be modified to bypass Pond 2. Pond 2 will remain active to capture and treat runoff from the West Stockpile and the Process Plant Area. Pond 3 will continue to capture and treat runoff from the East Stockpile. Pond 1 will be naturalized and a spillway constructed to convey flow towards the West Buskegau River. This design will remain in place until mine closure in Year 42. Figure 5.5 of Appendix K (Water Quality Assessment) of the Impact Statement illustrates the operations water management schematic for Year 35 (Ausenco 2024).

5.7 Constructed Wetland Pilot Studies

Wetlands are often used effectively as tertiary treatment of contact water at mine sites across Canada and other cold climate regions. In recent years, it has been identified that better treatment results of contact water can be obtained if specifically designed wetland cells/units are used, specifically using lateral and vertical flow processes focused on anaerobic processes and intended to insulate active microbial populations involved in water treatment.

Additional information related to the constructed wetland pilot studies will be discussed in the Mine Development Closure Plan. The intent will be to develop the pilot studies during operations, as needed and informed by monitoring.

5.8 Vegetation Test Plot Study

During operations, Canada Nickel will carry out vegetation test plot studies to evaluate the most effective revegetation approach for various application areas (i.e., dry slope aspects, coarse soils, wet flat areas, tailings). The purpose of these studies will be to explore different soil cover types, seed mixtures, planting species, irrigation, mulching and fertilization requirements. Seed mixtures will be composed of non-invasive native species. Through consultation with Indigenous nations, design and planning will incorporate plants of interest for Indigenous traditional use. A component of the test plotting will be to evaluate the success and learnings associated with the rehabilitation of the TMF and Impoundment Facility. Observations from past rehabilitation will allow the creation of a list of native species that are known to have good survival and reproduction within the PA whether seeded, planted or through natural regeneration.

The results of these studies will be used to update and inform the revegetation approach within the Vegetation Management Plan that will be established for the Project as well as the future Mine Development Closure Plan.

5.9 Waste Management

The types of solid waste anticipated to accumulate over the life of the Project includes domestic waste, hazardous waste, and demolition waste. Canada Nickel intends to develop a Waste Management Plan that will address management of all streams of waste. This plan will include guidance on the safe, short-term storage of waste prior to shipping off site to approved waste disposal facilities. Canada Nickel intends to appropriately manage, and ship waste off site on a regular basis throughout construction and operations. There will be no on-site waste disposal facility.

6 Closure

As per the *Mining Act*:

- Temporary Suspension is defined as “a planned or unplanned suspension of a project in accordance with a filed closure plan where protective measures are in place and the Project is being monitored continuously by the proponent.”
- State of Inactivity “means the indefinite suspension of a project in accordance with a filed closure plan where protective measures are in place but the Project is not being continuously monitored by the proponent.”
- Closed Out “means that the final stage of closure has been reached and that all the requirements of a filed closure plan have been complied with.”

For the purposes of the conceptual level of closure development contained within this document, temporary suspension and conditions at closure are discussed below.

6.1 Temporary Suspension

A temporary suspension of mine operations may be implemented for various reasons including, but not limited to, economic factors, operational factors, or corporate requirements. The duration is dependent on the individual factors.

During temporary suspension, Canada Nickel would continue to abide by regulatory monitoring requirements in addition to applicable Conditions of the Impact Assessment Decision Statement. Canada Nickel would also continue to abide by applicable permits and authorizations (and associated conditions) during a temporary suspension.

During temporary suspension:

- buildings and other structure access will be restricted to authorized persons only through all reasonable measures (e.g., gated entry, security)
- mine openings that are potentially dangerous shall be protected against unauthorized or inadvertent access through measures such as a boulder fence or berm placed on the perimeter of the Open Pit, or by using other approved methods
- electrical systems will be protected from inadvertent access
- mechanical and hydraulic systems will be maintained in a no-load condition
- physical, chemical, and biological monitoring programs will continue. It is anticipated that environmental approvals, such as PTTWs or ECAs will remain applicable/active, such that contaminated effluents will be controlled.
- waste management systems and locations, and storage of petroleum products, chemicals, and waste will be made secure

- rock piles and stockpiles of ore, overburden and other materials, and tailings, water, and other impoundment structures will be maintained in a stable and safe condition
- other reasonable measures will be taken to prevent personal injury or property damage that is reasonably foreseeable as a result of placing the Project in a state of temporary suspension

Deviations, if any, will be implemented according to regulatory approval. For the purposes of this Conceptual Closure Plan, further stages of closure beyond temporary suspension are discussed in terms of the active and passive rehabilitative methods. State of Inactivity and Closed Out as defined in the *Mining Act* will be discussed in the Mine Development Closure Plan.

6.2 Final Rehabilitation

After operations are complete, the PA will be reclaimed and the Project will move towards a final closed out condition. Most of the closure measures will be completed either during operations or in the first five years following completion of operations and will include removal and decommissioning of Project components not required for long-term closure and rehabilitation of the PA in accordance with the requirements of O. Reg. 35/24. Beyond this time, filling of the Open Pit will represent the main closure activity, as the Open Pit is anticipated to take greater than 100 years to fill after dewatering is terminated. Once the Open Pit has filled to form a pit lake, and water quality has been demonstrated to meet acceptable regulatory criteria, the Project would be moved to a closed out status as defined in the *Mining Act* and Recognized Closed Mine status under MDMER. This is expected to occur within five years after the open pit is filled.

Ongoing closure monitoring and maintenance activities will be carried out throughout closure until the closure objectives have been satisfied and the Project has been moved to a closed out status. Monitoring details are provided in Section 7.

Figure 5.8 of Appendix J (Site-Wide Water Management Plan) of the Impact Statement presents the Long-term Closure Water Management Schematic and Figure A.8 presents a figure of the Project Plan at Active Closure.

Active Closure

Closure rehabilitation activities will be carried out once it is no longer economical to mine, or once resources have been exhausted. Many of the closure activities that were not completed as Progressive Rehabilitation (Section 5) will take place within the first five years of the cessation of mining and ore processing, including decommissioning the Process Plants and other Project infrastructure. In general, the closure activities will be conducted in accordance with regulations that exist at the time of closure. Closure activities that will be completed for the PA include, but are not limited to, the following:

- decommissioning of process plants and unneeded treatment facilities
- removal of buildings
- site security and restricting access

- stabilization of stockpiles
- security of chemicals
- waste management
- security of mechanical, hydraulic and electrical systems that are no longer required

Passive Closure - Year 46 to Flooded Pit

Following the removal of major Project infrastructure and rehabilitation of mine features, the site will transition into passive closure monitoring and maintenance to confirm reclamation efforts are established and functioning as intended. During this final phase of rehabilitation and closure, emphasis will be placed on water quality monitoring, the ongoing filling of the Open Pit with water to create a pit lake, performance monitoring of the completed closure work, and maintenance, as required. Through preliminary modelling, it is predicted that filling the open pit with water may require more than 100 years. In general, the closure activities that will be completed in the passive closure phase of mine life include, but are not limited to, the following:

- rehabilitation and/or removal of remaining infrastructure, primarily related to water management and pit filling, once water quality meets criteria for discharge to the environment (e.g., ditches, ponds, water treatment)
- pit overflow spillway will be constructed and pit flooding will be completed
- monitoring and maintenance will continue until physical and chemical characteristics are deemed acceptable and stable, and the site can be closed out in accordance with applicable regulations

The following sections provide details on the final closure activities that will be completed for the main Project components. Further details related to the schedule of rehabilitation and closure activities will be developed and provided with the Mine Development Closure Plan.

6.2.1 Open Pit

6.2.1.1 Securing and Stabilizing the Open Pit

O. Reg. 35/24 outlines a variety of strategies for rehabilitating and closure of open pits, which were considered in developing the preferred approach for the Project.

As indicated by O. Reg. 35/24, open pits must be secured from inadvertent access with different security measures potentially used for different phases of the mine life (construction, operation, temporary suspension, inactivity, and active and passive closure). At closure, access and security around the Open Pit will be restricted by the installation of an earthfill berm with appropriate signage around the pit perimeter. Portions of the Open Pit's perimeter berm will be graded to make a shallow shoreline around the open pit to allow egress for people and animals once the Project is closed out according to the *Mining Act*.

6.2.1.2 Filling the Open Pit

Mining of the EZ of the Open Pit is scheduled to cease around Year 30 of operations. Dewatering of the pit will cease, except for water taking required for milling operations.

Approximately 779 Mm³ of tailings will be placed in the Open Pit during operations, which will remain about 30 m below the top of bedrock.

Upon closure, equipment and dewatering infrastructure will be removed, and the Open Pit will be allowed to fill with surface water runoff, precipitation, and groundwater seepage as follows:

- surface water runoff from the catchment of the open pit and direct precipitation will be captured by the Open Pit
- natural groundwater, flowing into the open pit at a predicted rate of 8,600 m³/day once dewatering activities cease, with the predicted groundwater inflow rate decreasing to 1,400 m³/day once the stage of the pit lake reaches the design elevation of the spillways

Filling of the pit will commence during Project operations. Hydrologic modelling is being completed to predict the time to fill the pit lake and the ultimate discharge rate from the pit lake rate at the East and West spillways. Preliminary hydrological modelling suggests greater than 100 years for the Open Pit to fill to the design elevation of 272.5 m amsl.

6.2.1.3 Passive Closure Pit Lake Water Quality

Water quality modelling of the pit lake is being completed to assess water quality once the pit lake has formed. The water quality modelling will consider inputs to the Open Pit from atmospheric precipitation, runoff from rock and ore exposed on pit walls, groundwater inflows, and interactions of the pit lake water with the tailings used to backfill the Open Pit.

The tailings placed in the Open Pit and the pit wall rock are predicted to be NPAG. Preliminary metal leaching rates are predicted to result in runoff and seepage quality that meets the PWQOs. Based on existing geochemistry data, no further water treatment is anticipated in closure.

Two passive spillway channels are expected to be constructed to connect the open pit to natural, adjacent waterbodies once water quality is stable and meets the criteria for discharge.

6.2.1.4 Pit Lake Water Level and Outlet

The final water level of the pit lake will be approximately 272.5 m amsl (spillway invert elevation). Once confirmed that the water quality is stable and meets criteria for discharge, an east and west passive spillway will be constructed. The east spillway will drain the EZ of the Open Pit with overland drainage to the West Buskegau River. The west spillway will drain the MZ of the Open Pit with overland drainage to the North Driftwood River. Monitoring of water quality within the Open Pit during filling will be completed to assess the potential discharge water quality and to determine if water treatment could be required.

6.2.2 Tailings Management Facility

Tailings will be deposited into a surface TMF until Year 17 of operations at which time they will be deposited into the MZ of the Open Pit (Years 18 to 29) and then later into the EZ of the Open Pit (Years 30 to 41). The TMF will be located to the south of the Open Pit and Process Plant Area and will have an approximate footprint of 2,300 ha.

As required by O. Reg. 35/24, TMFs shall be rehabilitated or treated to address permanent physical stability and effluent quality. The following describes how the TMF is to be rehabilitated to meet the requirements of O. Reg. 35/24.

6.2.2.1 Dam Safety and Operation

The TMF is required for the first 17 years of mine life with progressive rehabilitation commencing in Year 18. Until that time, the TMF will be operated as set out in the TMF's OMS manual. Section 7.2.4 describes the management of water in the TMF water management pond.

According to the CDA *Mining Dams Bulletin* (CDA 2014), the TMF may be considered in a state of closure and under passive care once:

- the surface of the TMF is passively discharging to the environment
- it has been shown that the TMF is stable
- the phreatic surface has come to a naturalized level with the environment

In accordance with the CDA *Dam Safety Guidelines* (CDA 2013) and the 2014 *Mining Dams Technical Bulletin* (CDA 2014), a tailings facility that is under passive care will continue to require regular dam safety inspections, review, and maintenance.

6.2.2.2 Slope Stabilization

At closure, a slope stability assessment will be carried out for the TMF embankments to demonstrate that the requirements set out by the CDA guidelines for long-term care are met. The TMF has been designed to the slope stability design criteria set out in the current CDA guidance (CDA 2013; 2014), and as long as the dam is managed and maintained appropriately, the slopes of the TMF will not require further stabilization under closure.

6.2.2.3 Vegetative Cover

The top surface of the TMF will be covered with 0.15 m of overburden and/or organic soil cover and revegetated to improve aesthetics, reduce the potential for surface erosion, and reduce the interaction between surface runoff and the tailings surface. Baseline geochemical testing indicated that the tailings will not be acid generating or pose metal leaching issues.

As part of progressive rehabilitation, vegetation test plot studies (Section 5.8) will be conducted in advanced of the TMF rehabilitation. Information from these studies will further guide decisions on the amount of soil cover and vegetation that will be applied.

The TMF dam embankments will be constructed of waste rock, which has very low susceptibility to dust and surface erosion. Inspections and maintenance of the dams will be regularly required, therefore vegetation on the embankments is not planned.

6.2.2.4 TMF Water Management

At closure, the TMF will already be reclaimed as the TMF is closed in Year 17 and assumes an additional 5 years for reclamation. A vegetated cover will be placed over the TMF. Runoff from the TMF will be directed to the North Driftwood Diversion Channel. A non-contact water diversion channel will divert runoff from the eastern portion of the TMF to the North Driftwood Diversion Channel. Naturalization of the TMF Northeast Collection Pond is planned following rehabilitation of the TMF and vegetation establishment. The TMF Northeast Collection Pond naturalization will include vegetation plantings and construction of a spillway overflow. The TMF Northwest Collection Pond will be naturalized and an overflow spillway constructed in Year 30, once dewatering of the Open Pit ceases (as the TMF Northwest Collection Pond is used for Open Pit dewatering). Seepage collection ditches will be infilled, and natural drainage patterns restored, to the extent feasible. Water will not be discharged to the environment until such time that water quality has been shown to consistently meet effluent criteria.

6.2.3 Impoundment Facility

6.2.3.1 Vegetative Cover

As required by O. Reg. 35/24, waste rock storage areas shall be rehabilitated to meet physical and chemical stability criteria. Geotechnical slope stability analyses will be carried out by a Qualified Professional at closure to confirm the stability of the slopes and certify that no further stabilization of slopes will be required to meet closure requirements.

In Year 30 of operations, Open Pit mining will cease, and the operations will transition to milling stockpiled ore for the remaining 12 years of operations. This will cease delivery of rock to the Impoundment Facility, therefore allowing further advancements in progressively rehabilitating the Impoundment Facility. A 0.15 m of overburden cover will be applied to the piles and vegetation will be established.

The rock impoundment will be sloped and benched in accordance with the future closure plan design as it is developed, creating overall slopes for final closure of six horizontal to one vertical (6H:1V). Clay cover and 0.15 m of organic material/overburden growth matrix will be placed. To limit erosion of the cover material, runoff channels will be incorporated into the reclamation design of the rock impoundment.

During progressive reclamation and into closure, material will be utilized from the clay and sand and till impoundment to reclaim laydowns, roads and other disturbed areas requiring vegetation. Once all site reclamation is complete (passive closure), the clay and sand and till impoundment will be graded and vegetated.

6.2.3.2 Seepage Collection

Reclamation of the Impoundment Facility will commence in Year 30 with an estimated 5 years for vegetation to establish, at which point the seepage collection ditches will be infilled and Collection Pond 1 will be naturalized, and an overflow spillway will be constructed. Pond 2 will continue to service the West Stockpile and Process Plant Area until Year 42 when Pond 2 will be naturalized, and an overflow spillway constructed. Seepage collection ditches will be infilled, and natural drainage patterns restored, to the extent feasible. Surface runoff from the reclaimed Impoundment Facility will ultimately be captured by the North Driftwood River and West Buskegau River. Water will not be discharged to the environment until such time that water quality has been shown to consistently meet effluent criteria.

6.2.4 Ore Stockpile

Prior to the end of operations, the East and West stockpiles will be processed. During active closure, the stockpile pads will be graded, covered with overburden, and revegetated. Collection ditches will be backfilled, covered with 0.15 m of overburden, and vegetated.

6.2.5 Removable Infrastructure, Equipment, and Materials

At the end of the LOM, infrastructure, equipment, and mining materials will be removed from the PA or rendered unusable in accordance with applicable regulations including O. Reg. 35/24. This includes buildings, pipelines, aggregate areas, lighting and security, service water supply, water management facilities, petroleum products, and waste materials.

The majority of these works will be carried out within the first five years of closure; however, some facilities (e.g., access roads and treatment plants) may be required for the proper care and maintenance of the Project during closure. Facilities will be removed/reclaimed when they are no longer required during closure.

Infrastructure will be decommissioned in accordance with O. Reg. 35/24 or other applicable legislation. Once removed, the areas will be stabilized to limit erosion and revegetated as required.

Buildings and associated infrastructure will be removed during active closure, although some buildings will need to remain in place to support passive closure monitoring. As operations progress towards closure, buildings and other infrastructure not required to support operations will be progressively rehabilitated.

In active closure, the following rehabilitation efforts will take place:

- Mine buildings, crushers, and above/below ground pipelines will be removed and disposed of in an approved landfill facility or sold for reuse/scrap. Concrete foundations may be removed and disposed or will be covered by overburden and revegetated.
- Machinery and equipment will be returned to the rental vendor or sold.

- Laydown areas, parking lots, haul roads, and access roads will be scarified, graded, and revegetated during the transition into passive closure as certain locations are no longer required. As roads are reclaimed, culverts will be removed and disposed of off-site.

In passive closure, the following rehabilitation will occur:

- Powerlines and transformers will be removed, including supporting infrastructure. Buildings that remain in place will be powered by generators.

6.2.6 Aggregate Sources

There are numerous potential sources for the construction aggregate that will be required during the first year of Project construction; however, potential aggregate sources for construction material are still being evaluated. If suitable aggregate is located within the PA, applicable permits will be sought, which will include proposed rehabilitation methods.

6.2.7 Revegetation

The objectives of the revegetation program are to stabilize surface materials from wind and water erosion, improve aesthetics, and establish self-sustainable non-invasive vegetation growth. Specifically, the end land use goals of the revegetation program will be as follows:

- The surface of the TMF will be revegetated in accordance with the cover design objectives. An integral part of the soil cover will be the vegetation (grasses). The surface of the TMF will be seeded to develop a vegetated cover to improve aesthetics, reduce the potential for surface erosion, and reduce the interaction between surface runoff and the tailings surface. Consideration will be given for future land use such as Indigenous traditional land use. As described in Section 5.8, soil tests and test plots will be carried out to confirm the most appropriate seed mixture and to identify requirements for mulching and fertilization. Monitoring will be completed to evaluate cover performance, including vegetation establishment and water quality performance.
- As required through progressive reclamation into closure, material will be utilized from Project locations to reclaim laydowns, roads, and other disturbed areas requiring vegetation.
- The rock impoundment will be progressively rehabilitated when areas will no longer be disturbed by material placement, at which time growth media and vegetation can be applied.
- Material from the clay and sand and till impoundment will be used during progressive and active closure to rehabilitate disturbed areas around the site. Once complete, the final stage of passive closure will be final grading, as necessary, and revegetation.
- Aggregate source areas potentially located in the future will be revegetated in accordance with the Best Management Practices for Aggregate Activities and Forest-Dwelling Woodland Caribou (MNR 2016) and the local ecosite. Other areas on site within the Kesagami Range, will be revegetated/reclaimed to assist in the creation of Caribou habitat where appropriate.

Revegetation will occur as soon as practical after Project components are no longer actively used. Prior to revegetation, the ground surface will be prepared through scarification or ripping of compact surfaces,

contouring the ground surface, placing overburden, adding soil amendments to support vegetative growth, and implementing erosion protection measures to protect the soil cover until vegetation is established. The requirements for land preparation for revegetation will meet Canada Nickel’s land use objectives and O. Reg. 35/24.

Details of the seed mixture, mulching, and fertilization requirements will be established through the progressive rehabilitation test plotting program. The test plotting will also be used for test planting prescriptions of local conifers. The fertilizer and irrigation needs and the influence of slope aspect and soil moisture on the survival rates of planted seedlings will be evaluated further in the Mine Development Closure Plan.

The revegetation will involve the placement of a 0.15 m thick layer of growth media consisting of stripped overburden and/or organics.

6.2.8 Effluent Water Quality Contingency Measures

The water quality from the Impoundment Facility and TMF, and pit lake have been predicted using a site wide water balance and water quality model (Appendix K of the Impact Statement). The modelling approach incorporates conservative assumptions to support the assessment of potential effects for the Impact Statement. As the project progresses modeling will be updated, contingency measures (potentially including passive treatment systems such as wetland treatment) will be identified based on those updates.

6.2.8.1 Wetland Treatment

A number of constructed wetlands have been implemented in cold climates, including at Trail, British Columbia, Ymir, British Columbia, and Park City, Utah. Each one is a full-scale constructed wetland treatment system that operates below 0 degrees Celsius (°C) conditions during the winter months. Trail is the warmest of the three sites with temperatures dropping to an average low of -22°C for one to two months (Mattes et al. 2011). As demonstrated by the success of the three constructed wetland systems listed above, the designs of constructed wetlands can be made robust with respect to winter conditions.

Table 6.1 presents a list of constructed wetlands at various stages of implementation, from pilot scale to full-scale implementation, that are successfully operating in cold climates.

Table 6.1 Examples of Constructed Wetlands Operating in Cold Climates

Project	Location	Target Parameters of Potential Concern (PoPC)
Golden Giant Gold Mine	Marathon, Ontario	Ammonia, Molybdenum
Landfill near Trail British Columbia	Trail, British Columbia	Arsenic, Lead, Zinc, Cadmium, and rare earth metals
Gold Concentrator	Ymir, British Columbia	Arsenic
Prospector Square Groundwater Drain Treatment Wetland	Park City, Utah	Zinc

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Project	Location	Target Parameters of Potential Concern (PoPC)
Dunka Mine – Duluth Complex Stockpiles	Minnesota	Copper, Nickel, Iron
Bell Mine	Babine Lake, British Columbia	Copper
Peerless Jenny King Mine - Upper Tenmile Creek Mining Area	Helena, Montana	Zinc, Iron, Aluminum, Copper, Nickel, Caesium
Lady Leith Mine	Jefferson County, Montana	Iron, Zinc
Luttrel Site - Upper Tenmile Creek Mining Area	Helena, Montana	Aluminum, Arsenic, Cobalt, Chromium, Copper, Iron, Manganese, Nickel, Lead, Zinc
Musselwhite Mine	Musselwhite Mine, Ontario	Ammonia
Minto Mine	Central Yukon	Copper, Selenium

7 Monitoring

Monitoring represents a key component of mine closure and will be completed to assess the physical, chemical, and biological stability of the Project, confirm that closure objectives have been met, and confirm when the Project has reached a condition appropriate for moving to closed out status as defined under the *Mining Act*.

The following sections provide a brief description of the conceptual monitoring programs that are proposed to meet the monitoring as required under Schedule 1 of O. Reg. 35/24. Additional monitoring may be incorporated into the Mine Development Closure Plan based on conditions and requirements associated with applicable permits and based on monitoring and testing programs completed as part of management plans that will be implemented during operations. Details on the monitoring locations, parameters, and frequencies will be developed as part of the Closure Plan that will be filed with the MINES prior to starting construction of the Project.

7.1 Physical Stability Monitoring

Until the Project achieves a 'Closed Out' status, physical stability monitoring is required for safety and to demonstrate that land, water and mine waste management structures, and other mine-related structures are stable. Specifically, the following features will require physical stability monitoring:

- Open Pit, including slope stability
- TMF dams
- Impoundment Facility (rock, clay, sand and till)
- water management structures
- surface infrastructure

The following subsections address the monitoring requirements for each of the elements cited above that are applicable to the Project. Table 7.1 provides a summary of the Project components where physical stability monitoring is required and the anticipated frequencies of monitoring. The monitoring frequency has been developed based on the anticipated closure planning stages, with the first five years representing the active closure phase when removal of Project components and rehabilitation efforts will be completed. From Year 6 of closure to when the Open Pit has fully filled, the monitoring will continue at a lower frequency and will be adjusted based on performance of the closure and rehabilitation programs.

Following each monitoring year, an annual report will be prepared to document the results of the monitoring program and provide recommendations for required rehabilitation efforts to address physical stability concerns or changes to the monitoring program.

Table 7.1 Physical Stability Monitoring Requirements

Monitored Area	Monitoring Frequency*	
	During Active Closure (first 5 years of closure, Year 41 to 46)	During Passive-Closure (Year 46 to Close Out)
Open Pit		
Visual inspection of slopes for stability and changes in drainage patterns	Annually	Every 5 years
Pit Lake Water Levels	Quarterly	Quarterly
TMF		
General facility surveillance	Monthly	Semi-annually
Water levels and pumping rates	Daily during periods of pumping	Daily during periods of pumping
Seepage Collection System	Monthly	Monthly
Water management structures and spillways	Annually	Annually
Dam safety inspection	Annually	Annually
Dam safety review	Every 5 years	Every 5 years
Watercourse Realignments		
Watercourse Diversion(s)	Annually	Annually
Impoundment Facility		
Visual inspection for stability and cover stability	Annually	Every 5 years
Collection ponds and ditches	Monthly	Monthly
Note: <i>*Monitoring frequency is preliminary and will evolve based on regulatory requirements, industry best practice and site-specific observations.</i>		

7.1.1 Open Pit

During operations, the stability of the faces of the Open Pit will be assessed regularly and will be maintained in a physically stable state throughout operations. At the completion of mining, a closure stability assessment will be carried out in accordance with O. Reg. 35/24 for the Open Pit walls and recommended rehabilitation efforts will be carried out as required.

The water level in the Open Pit will be monitored on a quarterly basis until the water levels reach the planned final closure elevation. For the Open Pit slopes, annual monitoring is proposed for the first five years of closure with the frequency reduced to every five years assuming stable conditions persist.

7.1.2 Tailings Management Facility

Monthly monitoring of the TMF will include visual inspections of the overall facility including the reclaimed surface/cover, water level and pond slopes, spillways, tailings dams, and seepage collection system. Water levels and pumping rates from the TMF and the Northwest Collection Pond and Northeast Collection Pond will be monitored daily while active pumping is occurring.

Dam Safety Inspections and Reviews will be carried out for the TMF in accordance with the CDA guidelines (CDA 2013) and the Ontario *Lakes and Rivers Improvement Act*. It is expected that dam safety inspections will be required annually and reviews will be required every five years; however, the required frequencies will ultimately be based on the Hazard Classification of each dam.

- **Dam safety inspections** will include a visual inspection of the tailings embankments for signs of sloughing, piping, erosion, sliding, water control structures (e.g., ditches, spillways), beaver and rodent activity, vegetative cover, review of instrumentation, and review of the OMS manual.
- **Dam safety reviews** will consist of a review of the current legislation related to the dam, a risk assessment, failure assessment, hazard classification, hydrotechnical, geotechnical, and operational assessment of the facility.

TMF monitoring programs will evolve as permits and approvals are obtained.

7.1.3 Impoundment Facility (Rock, Clay, Sand and Till)

As required by O. Reg. 35/24, the piled waste rock is to be monitored for signs of physical instability (slope stability, erosion, and vegetation cover) on a monthly basis during initial rehabilitation efforts, decreasing to annually once performance of the facility meets closure requirements. Inspections will include a walkover of the cover material on top of the waste rock to identify potential drainage issues (e.g., silt accumulation in channels, excessive settlement causing pooling, erosion gullies, and spillway scour), ground cover established by vegetation, and visual inspection of the slopes for signs of movement/sloughing. Inspections will be completed annually during active rehabilitation and reduced to once every five years until stable conditions have been confirmed.

7.1.4 Water Management Structures

The primary water management structures, outside of the TMF, that will remain at the end of operations include the North Driftwood Diversion Channel and the Open Pit spillway.

Annual inspections of the diversion channel will be completed for signs of erosion, and protection measures will be implemented, if needed.

The contact water collection system is expected to remain in place until water quality meets effluent criteria. While in operation, inspections, and monitoring for signs of erosion and blockages will be completed monthly. Once the contact water collection system is decommissioned, or retrofitted to constructed wetland treatment systems, if needed, monitoring frequencies will be adjusted based on Project conditions and performance objectives.

7.1.5 Surface Infrastructure

Buildings and foundations will be removed during the first five years of closure. While in place, annual inspections of buildings will be completed.

7.2 Chemical Stability Monitoring

Chemical stability monitoring of Project discharges, receiving surface water, and groundwater will be completed in accordance with applicable regulatory requirements and approvals including, but not limited to, the Closure Plan, ECAs, PTTWs, MDMER, O. Reg. 35/24, ODWQS, and PWQO. Once the conditions of these regulatory approvals are finalized, a detailed monitoring program will be developed for the Project. The details of this monitoring program (for construction, operations, and closure) will be described in the ECA and PTTW, including sampling locations, methods, frequency of sampling, and reporting procedures.

For the purposes of this Conceptual Closure Plan, the following subsections provide an overview of the general surface water and groundwater monitoring programs for closure based on anticipated monitoring requirements. The program will be adapted based on actual Project conditions observed through operation.

7.2.1 Surface Water Monitoring

The objectives of the closure surface water monitoring program are to confirm compliance with regulatory approvals and to confirm performance of the final rehabilitation measures.

The closure surface water monitoring program will incorporate water quality, water level, and (during ice-free period) channel velocity, depth, and/or flow profiling, as applicable, to monitor the following:

- contact water ponds managed by the Project (not discharged to the environment) to identify if water quality meets long-term discharge criteria and may be eligible for direct discharge to the environment
- contact water ponds (above) that have been shown to meet long-term discharge criteria and are discharging directly to the environment to confirm compliance with regulatory approvals
- pit lake water quality
- receiving waterbodies and watercourses, both upstream and downstream of discharge flows, to identify effects of discharge flows on the environment and confirm compliance with regulatory approvals

Existing statutes and regulations, namely the *Mine Rehabilitation Code of Ontario*, identify surface water quality parameters to be monitored from mines, as well as monitoring and certification requirements for assessing the success of closure activities with respect to surface water quality. The closure surface water monitoring plan will be developed to meet requirements under the Mine Rehabilitation Code.

7.2.2 Groundwater Monitoring

Canada Nickel will develop a closure groundwater monitoring program to document the recovery of groundwater levels as the Open Pit fills and to confirm compliance with regulatory approvals. The closure groundwater monitoring program will incorporate both groundwater level and water quality monitoring at key Project locations.

It is anticipated that the monitoring program will be composed of the following key elements:

- monitoring wells at select locations around the Open Pit to measure groundwater level recovery during closure
- monitoring wells upgradient and downgradient of the TMF and Impoundment Facility, to monitor groundwater levels and water quality during closure to document changes to groundwater levels and groundwater quality, and the effects of seepage collection measures
- groundwater quality samples from monitoring wells will be monitored annually during closure with the locations and frequency progressively reduced based on monitoring results and phases of closure. Groundwater quality samples will be analyzed for general chemistry parameters and select dissolved metals.

Existing statutes and regulations, namely the *Mine Rehabilitation Code of Ontario*, identify groundwater quality parameters to be monitored from mines, as well as monitoring and certification requirements for assessing the success of closure activities with respect to groundwater. The closure groundwater monitoring plan will be developed to meet requirements under the *Mine Rehabilitation Code*.

7.2.3 Water Quality Parameters

Water quality will be monitored with respect to both regulatory approval (compliance) limits and potential trigger concentrations, which indicate when contingency measures may be required.

Water quality monitoring (both surface water and groundwater monitoring) will include, at a minimum, the parameters required under the *Mine Rehabilitation Code of Ontario*, and PWQO. Project-specific parameters identified through the Impact Assessment will also be monitored (Table 7.2).

Table 7.2 Chemical Monitoring Parameter List

General Parameters	Anions	Metals
Mine Rehabilitation Code of Ontario Parameter List		
pH	Ammonium	Aluminum
Conductivity	Sulphate	Arsenic
Total Suspended Solids (Surface Water only)	Cyanide (total and free)*	Cadmium
Total Dissolved Solids (TDS)	-	Calcium
Alkalinity	-	Copper
Acidity	-	Iron

General Parameters	Anions	Metals
Hardness	-	Lead
-	-	Mercury
-	-	Molybdenum
-	-	Nickel
-	-	Zinc
PWQO Parameters (further to O. Reg. 34/24)		
None	Phosphorus	Antimony
-	Cyanide (WAD)*	Beryllium
-	Un-ionized Ammonia (NH3)	Boron
-	-	Cobalt
-	-	Chromium
-	-	Silver
-	-	Selenium
-	-	Tungsten
-	-	Uranium
-	-	Vanadium
-	-	Zirconium
Project Specific Parameter List (further to O. Reg. 35/24 and PWQO)		
To Be Determined	To Be Determined	To Be Determined
Notes:		
- = not applicable		
* cyanide is not proposed to be used in processing and is removed from the list		

7.3 Biological Monitoring

Biological monitoring programs will be implemented for the aquatic and terrestrial environments, to document the overall success of the closure and rehabilitation efforts for the Project. The following provides a summary of the conceptual monitoring programs for the aquatic and terrestrial environments.

7.3.1 Aquatic Monitoring Program

Monitoring of the aquatic environment will be conducted throughout active closure in accordance with applicable regulatory requirements. The frequency of monitoring will decrease over time based on project-specific conditions and terminated once closure objectives are satisfied. Details of the monitoring requirements will be provided in regulatory documents (i.e., ECA, environmental effects monitoring as per MDMER, and the Closure Plan).

Monitoring would include, but not be limited to, the following components:

- a benthic invertebrate survey
- a fish community survey
- fish tissue sampling for metal burdens
- supporting water and sediment quality sampling
- toxicity testing

Water quality monitoring conducted as part of the aquatic monitoring program will comprise a small component of the overall surface water quality monitoring program during closure, which is outlined in Section 7.2.1.

The results of the monitoring program will be summarized to look at trends over time and statistical differences between baseline and reference conditions. Standard accepted methods outlined in the MDMER technical guidance documents and current best practices will be employed.

Sampling areas will include North Driftwood River, West Buskegau River, and Jocko Creek. The program would also include an appropriate reference lake and creeks for comparison. Other areas that would be considered for long-term monitoring are constructed habitats (i.e., North Driftwood River Diversion), as well as offset areas.

7.3.2 Terrestrial Monitoring Program

A monitoring program will be developed to monitor the success of revegetation considering the end land use goals. The program will be designed to assess revegetated areas such as the Impoundment Facility, TMF, and other areas, which would be inspected during late spring and summer during active rehabilitation and at a reduced frequency in passive closure. The objectives of the program are to determine whether revegetation measures are successful.

8 Expected Project Conditions when Closed Out

8.1 Land Use

Rehabilitation of the PA will be focused on promoting vegetation communities that support local habitat for local species diversity. Most access restrictions will be lifted after closure measures are implemented. It is anticipated that recreational activities such as hunting, hiking, snowmobiling, and economic uses such as forestry, would be permitted where feasible.

8.2 Topography

The principal topographic changes within the PA relative to predevelopment conditions include the following:

- A pit lake with a boulder fence installed around the perimeter. The pit lake will be approximately 4,400 m long by 3,100 m wide and 690 m deep. The ultimate water level of the pit lake will be at an elevation of 272.5 m amsl.
- The TMF will occupy 2,300 ha and store 485 Mm³ of tailings with dams ranging in elevation from 275 m to 305 m amsl.
- The clay impoundment will store 205 Mm³ of clay, retained by a 34 m high perimetral waste rock clay storage berm. The total volume of waste rock required to build the berm will be 74.5 Mm³. The final elevation of the clay impoundment will be 300 m amsl.
- The sand and till impoundment will have a final height of 50 m above natural ground level with slopes at 6H:1V. The final elevation will be approximately 330 m amsl.
- The rock impoundment will accommodate 1,435 Mm³ at closure and reach a height of 110 m, therefore making the final elevation approximately 380 m amsl.
- The diversion of an outlet from Martin Lake to North Driftwood River will permanently alter the drainage of the PA.

8.3 Local Surface Waters and Receiving Waters

8.3.1 Open Pit

Once the pit lake reaches an elevation of 272.5 m amsl and water quality is suitable, it will be directed to the West Buskegau River and North Driftwood River through two spillways into a gently sloped channel, which may include a constructed wetland, if required, for final treatment and polishing prior to discharge.

8.3.2 North Driftwood River

The North Driftwood Diversion Channel will be constructed using natural channel design principles and will provide compensation for the loss of fish habitat that cannot otherwise be mitigated or avoided during construction. The North Driftwood Diversion Channel will extend from Martin Lake and reconnect into the North Driftwood River downstream of the PA. The North Driftwood River diversion will remain in place after closure. The final configuration and the design of the diversion channel will be confirmed through consultation with regulatory agencies regarding habitat compensation requirements and design flows.

At closure, the North Driftwood River will receive surface water flow from the Open Pit as well as surface runoff from rehabilitated areas such as the TMF, Impoundment Facility, and West Stockpile.

8.3.3 West Buskegau River

After pit flooding, the West Buskegau River will receive surface water flow from the Open Pit. In addition, the West Buskegau River will receive surface water runoff from rehabilitated areas such as the Impoundment Facility and East Stockpile.

8.4 Groundwater Conditions

The active closure phase will extend over approximately five years, followed by the passive-closure phase which extends from Year 6 of closure activities (Year 46 of overall mine schedule). The groundwater flow model (Appendix C.4 of the Impact Statement) was used to predict the groundwater drawdown in closure relative to baseline and groundwater discharge rates from the TMF and Impoundment Facility to the Open Pit and surface water features.

The predicted steady-state flows from the flooded pit lakes to the east and west spillways in passive closure are 900 and 500 m³/day, respectively. The spillways control the stage of the pits in passive closure at 272.5 m amsl, which is approximately 7 m above to 3 m below the baseline groundwater elevation within the Open Pit.

Table 8.1 presents the comparison of predicted groundwater discharge rates in baseline with predicted groundwater discharge rates for the passive closure phase. The North Driftwood Diversion Channel was maintained for the passive closure phase. In general, predicted groundwater discharge to surface water in passive closure is similar to baseline conditions before mine operations occurred. Martin Lake and the unnamed lake near the West Stockpile show an increase in groundwater discharge for passive closure. These lakes are located closest to the pit lakes where a spillway maintains the surface water elevation at approximately 272.5 m amsl which is approximately 5 to 8 m above the baseline groundwater elevation, resulting in groundwater mounding in this area. The groundwater mounding results in a greater horizontal hydraulic gradient toward the lake resulting in a higher than baseline predicted groundwater discharge rate to the lake. For the remaining lakes, predicted groundwater discharge to the local lakes generally returned to baseline conditions.

Table 8.1 Predicted Groundwater Discharge to Surface Water Features – Passive Closure

Surface Water Feature	Predicted Groundwater Discharge Rate (m ³ /d)		
	Baseline ¹	Passive Closure with Pit Lakes ¹	Percent Increase (Decrease)
Jocko Creek	6,104	6,230	2
North Driftwood River	6,334	2,160	(66)
West Buskegau River	1,234	1,788	45
Unnamed Lake (South of Zed Lake)	1,054	1,157	10
Zed Lake	-1,620	-1,584	2
Mel Lake	1,211	1,272	5
Sutherland Lake	-2,858	-2,627	8
Jack Lake	350	332	(5)
Gerry Lake	6,444	6,748	5
Martin Lake	1,577	2,809	78
Unnamed Lake (West Stockpile)	58	301	419
Note:			
1. A negative number indicates that surface water is recharging groundwater at that reach/lake.			

8.5 Vegetation Communities, Wildlife and Wildlife Habitat

Following closure of the Project, it is anticipated that many of the terrestrial plants will be revegetated through active or passive recolonization. The following changes are expected to result from the completion of the closure measures. The plan to monitor for these changes will be confirmed in the Mine Development Closure Plan:

- Some species (e.g., ground-nesting birds, moose) may return to the PA soon after active closure, to use recently rehabilitated areas, while other species that require mature forest stands may not return to the PA for decades following closure. The shrub stage of succession following active rehabilitation is likely to support the most varied suite of wildlife species (e.g., snowshoe hare, American black bear, moose, songbirds).
- Once decommissioning and active rehabilitation activities are completed, most areas will become accessible again and wildlife is expected to return to the PA and surrounding local area.
- Indirect effects related to sensory disturbance during the construction and operations phases would continue throughout active closure; however, they are expected to be less pronounced than during operations. It is expected that indirect effects (i.e., avoidance of use) on habitat within the local and regional areas will be reversed following the completion of active closure activities.
- Passive closure activities, such as capping and revegetating areas where disturbance or removal of vegetation has occurred, are intended to improve the quality of vegetation communities within the PA with respect to conditions during operation:

- Tailings beaches will be covered with 0.15 m of growth media and will be revegetated, using the results of revegetation test plots implemented during progressive rehabilitation.
- The Impoundment Facility will be sloped and benched, creating overall slopes for final closure of six horizontal to one vertical (6H:1V). The slopes and benches of the Rock Impoundment Facility will be revegetated. The Rock Impoundment Facility will also be progressively rehabilitated when areas will no longer be disturbed by material placement at which time overburden placement and vegetation can be applied. To limit erosion of the cover material, runoff channels could be incorporated into the reclamation design of the Rock Impoundment Facility.
- Disturbed footprints in other areas will be revegetated based on the local ecosite but, in time, should allow for the establishment of adjacent vegetation communities to reclaim these areas. These areas include the process plant area, portions of roadways, and other infrastructure.
- Aggregate source areas within the PA, if any, will be revegetated in accordance with the MNR's Best Management Practices for Aggregate Activities and Forest-Dwelling Woodland Caribou (MNRF 2016).
- Revegetation will be guided by MNR's *Best Management Practices for Mineral Exploration and Development Activities and Woodland Caribou in Ontario* (MNRF 2020).
- Direct disturbance and loss of wetlands will occur due to the removal of wetland vegetation, wetland soils and overburden material, and the infilling of wetlands. As such, it is unlikely that wetland communities removed for the Project will be restored to their original state. During closure, these locations may be reclaimed as upland communities, which will result in a net loss of wetland cover.

8.6 Aquatic Habitat and Fisheries

Construction, operations, and decommissioning and closure of the Project is anticipated to result in the unavoidable HADD of approximately 140 ha of fish habitat within the PA. Most of the affected habitat will be in the North Driftwood River watershed, with smaller areas affected in the West Buskegau River watershed and Jocko Creek watershed.

Potential HADDs of fish habitat may occur in these watersheds due to:

- overprinting of fish-bearing watercourses and waterbodies under the mine footprint
- change in stream flows downstream of the PA
- change in lake levels due to changes in surface run-off or groundwater table elevation near the Open Pit

The final Fisheries Offset Plan will be developed in conjunction with stakeholder consultation, including regulators, local residents, and Indigenous nations. More information related to cumulative offsetting area, net ratio of habitat gain, and how the offsets will be achieved will be included in the Mine Development Closure Plan.

Productivity monitoring will be carried out through operations and closure, and offsetting targets (productivity targets) are expected to be achieved during operations once aquatic biota colonize the constructed habitat. If the results of the monitoring program conclude that, during operations, the productivity targets have not been met, additional offsetting will be implemented at closure.

9 Consultation on the Conceptual Closure Plan

Consultation has been ongoing prior to and throughout the Impact Statement process and will continue with regulators, Indigenous nations, and stakeholders through the life of the Project.

The Impact Statement provides more detail on the consultation process covering open houses, Project site visits, targeted meetings, newsletters, questionnaires, presentations, and capacity funding for technical reviews and community-based studies, among other areas (Chapters 6 [Public Participation and Views] and 7 [Description of Engagement with Indigenous Peoples]). Details on Indigenous interests are provided in Chapters 25 to 28 (Assessment of Potential Effects on Indigenous Interests) of the Impact Statement.

During consultation related to the Conceptual Closure Plan there were no comments or feedback received that required changes to the conceptual plan.

Additional consultation on closure will be carried out prior to filing of the Mine Development Closure Plan. A record of comments received by Canada Nickel with respect to the Mine Development Closure Plan, and associated responses provided by Canada Nickel will be appended to the Mine Development Closure Plan.

10 References

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Appendices

Appendix A Figures



- Legend**
- Project Area
 - Local/Regional Study Area
 - Railway
 - Expressway / Highway
 - Major Road
 - Minor Road
 - Watercourse
 - Provincial Park
 - First Nation Reserve
 - Waterbody



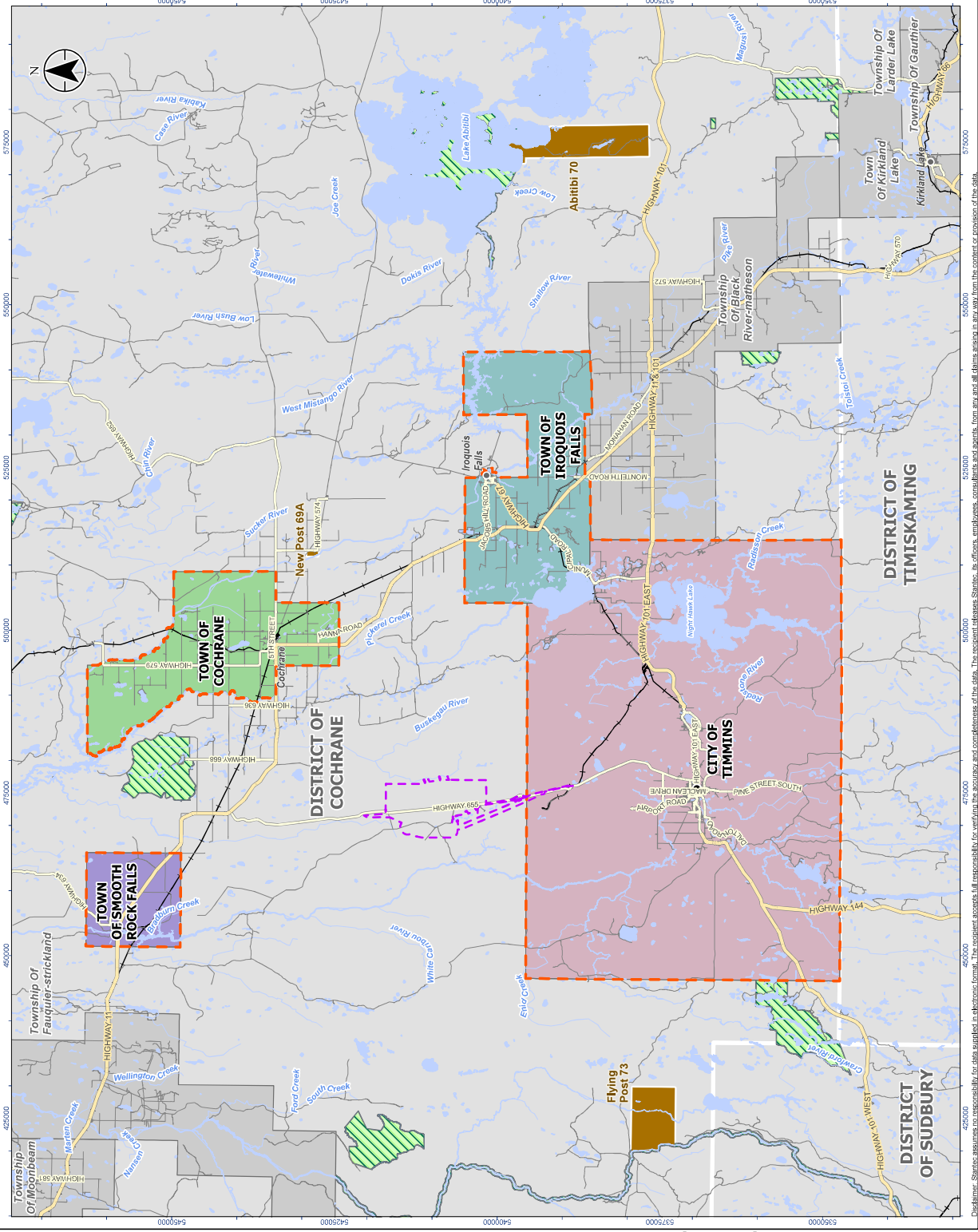
Notes

- Coordinate System NAD 1983 UTM Zone 17N
- Base feature processor under license with the Ontario Ministry of Natural Resources and Forestry & Planning for Ontario, 2021.



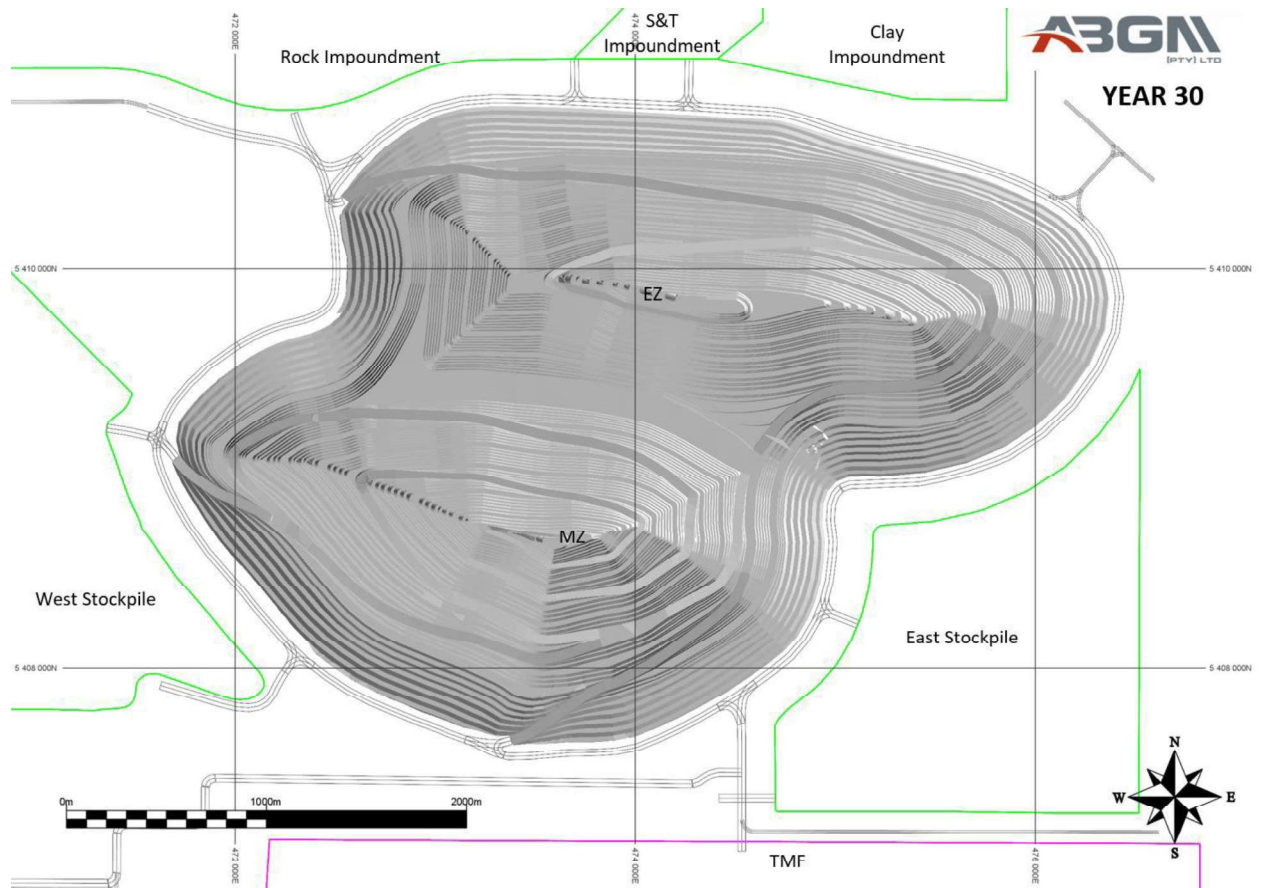
Client/Owner
Canada Nickel Company (CNC)
Crawford Nickel Project

Figure No.
A.1
Title
Project Location



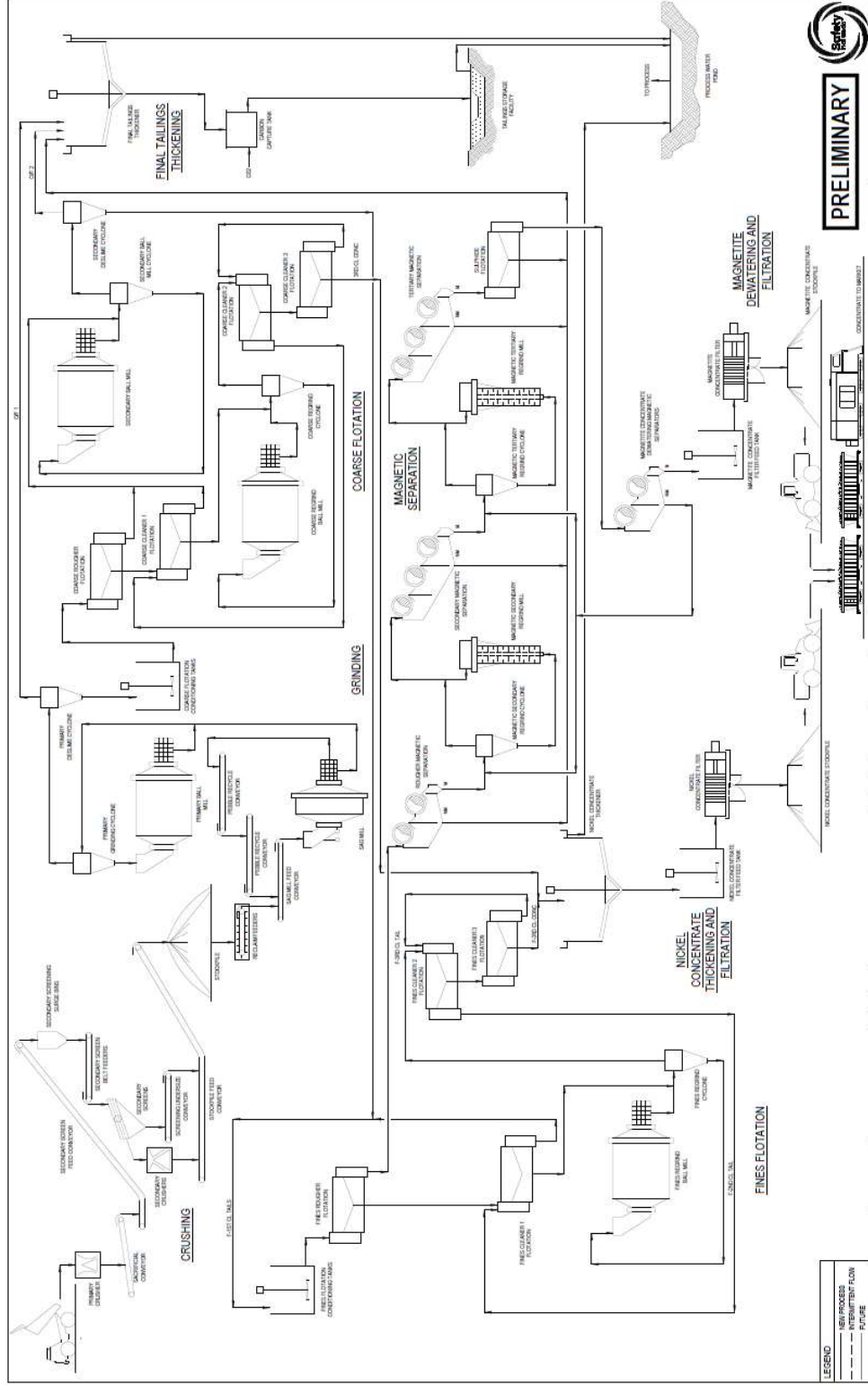
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Figure A.4 Pit Configuration Year 30



Source: Ausenco 2023

Figure A.6 Process Flow Sheet



Source: Ausenco, 2023



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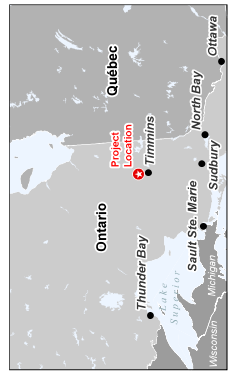


CANADA NICKEL
CORP.

- Legend**
- Project Area**
- Stockpiled Ore removed cover with topsoil (0.15 m), plant with native seed/trees
 - Open Pit (Pit flooding initiated)
 - Cover with topsoil (0.5 m) and plant with native seed/trees
 - Pond
 - Cover with simple cover and vegetate
 - All laydown areas and buildings removed cover vegetate with native trees with topsoil (0.15 m)
 - Pit Safety Berm (2 m high) cover with topsoil and native seed mix
- Auxiliary Infrastructure**
- Relocated Hwy 655
 - Rail Spur Line
 - Transmission Line
 - Discharge Route
 - Non-Contact Water Channel
 - Contact Water Channel
 - Site Road
 - Discharge Location
- Proposed Project Components**
- Existing Major Road
 - Existing Minor Road
 - Existing Transmission Line
 - Watercourse
 - Waterbody
- Base Features**
- Existing Major Road
 - Existing Minor Road
 - Existing Transmission Line
 - Watercourse
 - Waterbody

Notes

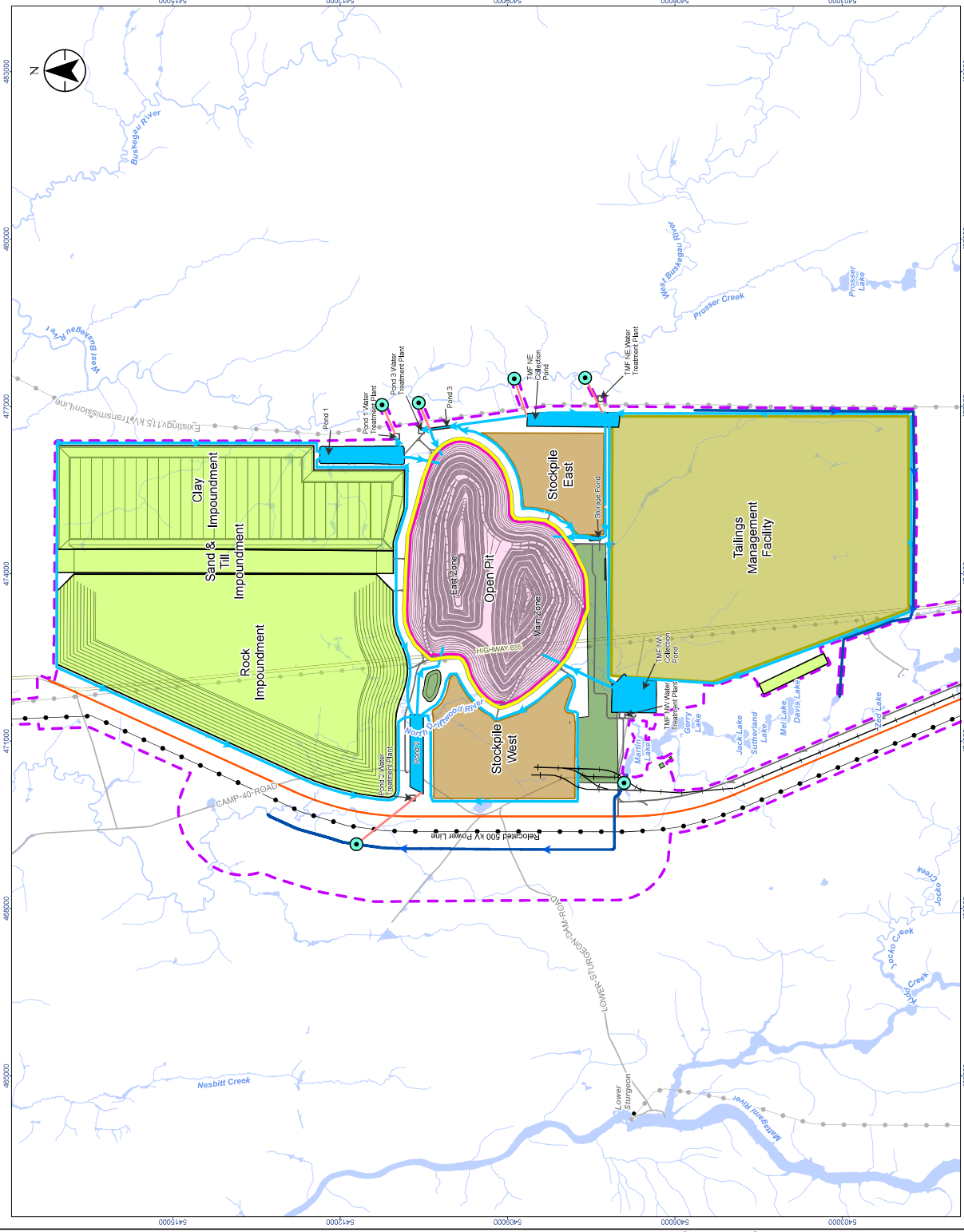
- Coordinate System NAD 1983 UTM Zone 17N
- Base feature property under license with the Ontario Ministry of Natural Resources and Forestry
- The Project Components and baseline information on this figure are considered preliminary and subject to change. The Project Components and baseline information are based on feedback received from agencies, Indigenous peoples, the public, and project stakeholders.



18030456 REV1
Prepared by: toophan on 2024-05-13

Client/Owner:
Canada Nickel Company (CNC)
Crawford Nickel Project

Figure No.
A.8
Title
Project Plan at Active Closure



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