Crawford Nickel Project
Impact Statement

Chapter 8 Assessment Methodology

Prepared for:
Canada Nickel Company

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Acronyms and Abbreviations

COSEWIC	Committee on the Status of Endangered Wildlife in Canada
IAA	*Impact Assessment Act,* 2019
IAAC	Impact Assessment Agency of Canada
LSA	Local Study Area
PA	Project Area
RSA	Regional Study Area
SAR	Species at Risk
SARA	*Species at Risk Act*
VC	Valued Component

8 Assessment Methodology

This chapter describes the methods used to assess the potential effects of the Crawford Nickel Project ('the Project'), which was structured to meet the requirements of the *Impact Assessment Act* (IAA), 2019. The methods were informed by federal and provincial regulatory requirements with specific consideration of the Tailored Impact Statement Guidelines – Crawford Nickel Project (TIS Guidelines) dated March 31, 2023 (refer to Appendix A.1 of the Impact Statement).

8.1 Scope of the Assessment

The scope of the assessment includes the selection of Valued Components (VC) and the rationale for their selection, description of temporal and spatial boundaries, identification of potential effects, description of measurable parameters, identification of potential Project interactions with VCs and proposed mitigation and enhancement measures. An assessment of cumulative effects and a description of effects to help characterize the extent to which effects are significant will also be completed.

8.2 Scope of the Project

The scope of the Project is defined by the components and activities required to construct and operate the Project's temporary and permanent facilities, including the preparation of the site for construction, and the decommissioning and closure of Project facilities at the end of the Project life.

The Project's components and activities are described in Chapter 3 of the Impact Statement. Alternative means of carrying out the Project are presented in Chapter 5 of the Impact Statement, as is an evaluation of alternatives to achieve the Project's purpose. Mitigation measures incorporated as part of planning and design to reduce potential adverse effects are presented in Chapter 3 of the Impact Statement and Chapters 10 to 28 of the Impact Statement. A compilation of all mitigation measures listed in the Impact Statement is also incorporated into the Summary of Project Commitments (see Appendix E of the Impact Statement).

8.3 Assessment Framework

The methodology used in the preparation of the Impact Statement is based on a structured approach consistent with international best practices for conducting environmental impact assessments, including the International Association for Impact Assessment's *Principles of Environmental Impact Assessment Best Practice* (IAIA 1999), and the methodology used by Stantec for the assessments of other major projects assessed under the IAA and *Canadian Environmental Assessment Act*, 2012. The assessment methodology is structured to:

- Identify and describe the components and activities of the Project.
- Predict and evaluate potential changes to the environment and the likely effects on identified VCs.

- Consider key issues raised by Indigenous nations, agencies, scientists, Canada Nickel, stakeholders and the public.
- Integrate technically and economically feasible measures to mitigate adverse effects and enhance positive effects.
- Determine remaining residual effects and describe the effect to help characterize the extent to which effects may be significant after the implementation of mitigation measures.
- Develop follow-up and monitoring programs to verify the accuracy of the effects assessment and the effectiveness of mitigation and enhancement measures.

The methodology is concentrated on the identification and assessment of potential adverse effects of the Project on VCs and is summarized in Figure 8.1.

Throughout Project planning, Canada Nickel has implemented design measures and proposed management strategies to avoid or reduce potential adverse effects of the Project. The effects assessment methodology used in the preparation of the Impact Statement employs a precautionary, conservative approach. Conservative assumptions have been generally applied to overstate rather than understate potential adverse effects. Aspects of the Project have been examined and planned in a precautionary manner to avoid or reduce effects. The level of confidence in the conclusions of the assessment of potential effects is discussed in each VC chapter (Chapters 10 to 23 and 25 to 28), with inherent gaps, assumptions and uncertainties identified.

Integral to the preparation of the Impact Statement was the consideration and incorporation of Indigenous knowledge. Community knowledge and Indigenous knowledge acquired through public participation and engagement with Indigenous nations and shared with Canada Nickel has been incorporated into the Impact Statement. Chapter 7 of the Impact Statement includes a description of the methodology used engage Indigenous nations, while Chapters 25 to 28 identify considerations and the incorporation of Indigenous knowledge into the effects assessment.

8.3.1 Influence of Consultation and Engagement on the Assessment

The preparation of this Impact Statement and subsequently the effects assessments were influenced by Canada Nickel's engagement with potentially affected Indigenous nations, agencies, stakeholders, and the public.

Within each VC chapters (Chapter 10 to 23 and 25 to 28), a summary of key information, including Indigenous knowledge, and concerns that the Project identified as part of its engagement efforts is provided. It also summarizes the influence that the outcomes of this engagement have had on the assessment.

8.3.2 Gender-based Analysis Plus

The TIS Guidelines require a Gender-based Analysis Plus (GBA Plus) to determine how sub-populations and sub-groups of the Local Study Area (LSA) and Regional Study Area (RSA) may experience disproportionate effects from the Project. Sub-populations and sub-groups may include women, Indigenous nations, visible minorities, persons with disabilities, youth, and older adults, among others, and groups who demonstrate any intersection of those characteristics.

Both qualitative and quantitative data have been used to describe baseline conditions across diverse or distinct subgroups, where GBA Plus factors have the potential to be relevant to the understanding of effects for a particular VC. Following a review of baseline conditions, GBA Plus was integrated into the overall effects assessment for applicable VCs (refer to Section 8.7), with appropriate mitigation measures and follow-up identified, as required.

8.4 Selection of Valued Components

8.4.1 Definition of 'Valued Component'

The Impact Assessment Agency of Canada (IAAC) defines a VC in the IAA as:

> "Environmental, health, social, economic and potentially other elements of the natural and human environment that is identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance."

As outlined in the TIS Guidelines, VCs consists of components that are of particular concern or value to participants and that may be affected by the Project. The value of a component not only relates to its role, but also to the value people place on it.

8.4.2 Use of Valued Components in the Impact Assessment Process

VCs are a tool used to measure the potential effects of a project on the environment. The 'environment' includes not only ecological systems, but also human, or social, cultural and economic conditions. Given the large number of elements of the natural and human environment (e.g., species, habitats) that could potentially occur within the vicinity of the Project (Section 8.4), the Impact Statement focuses on those elements that have been deemed to be of some importance. Considerations in the selection of VCs for the Project are detailed in Section 8.3.3.

8.4.3 Factors Considered When Selecting Valued Components

In the selection of VCs, the following factors were considered:

- Regulatory guidance and requirements, such as those included in the TIS Guidelines.
- Concerns raised by and the possibility that an adverse or positive effects on the VC would be of concern to Indigenous nations, the public, federal, provincial, municipal, or other stakeholders.

- The extent to which the VC is linked to Indigenous interests or the rights of Indigenous Peoples, and whether an Indigenous nation has requested the VC.
- VC presence in the Project Area (PA), LSA and RSA.
- Whether potential effects of the Project on a VC can be measured and/or monitored or would be better ascertained through the analysis of a proxy VC (e.g., health).
- Existing environmental conditions in the PA and interconnections between the physical, biological and human components of the environment.
- The extent to which potential effects of the Project and related activities have the potential to interact with the VC.
- The extent to which the VC may be affected by other past, existing or future projects, activities or natural processes.
- The potential for a notable contribution to sustainability.
- Information from any ongoing or completed regional or strategic assessment processes.
- Experience and lessons learned from similar mining projects.
- Expert input or professional judgement.

8.4.4 Valued Components Selection Process

During the preparation of the Detailed Project Description, Canada Nickel began to develop a list of potential VCs that may be applied through the Project. Input was sought on VCs during:

- Development of the Detailed Project Description (refer to CIAR#45 for a summary of consultation and engagement undertaken)
- Various sessions with Canada Nickel's Community Committees
- A Materiality Assessment conducted in 2022, which identified topics of interest to the local community (Canada Nickel 2023)
- IAAC's consultation on the TIS Guidelines (refer to CIAR#101 for comments received by IAAC during the Planning Phase)

A preliminary list of VCs was developed and provided to the IAAC as part of the Work Plan for the Preparation of the Crawford Nickel Project Impact Statement (Canada Nickel 2023) submitted to IAAC on June 30, 2022, and updated December 12, 2023. Consideration was provided to the components identified in Section 7.2 of the TIS Guidelines as important to consider in the assessment, as well as to the biological, health, social and economic conditions specified in Sections 8 through 11 of the TIS Guidelines (Appendix A.1 of the Impact Statement).

Prior to the finalization of VCs, Canada Nickel engaged Indigenous nations and other relevant stakeholders to review and discuss their selection.

8.4.5 Selected Valued Components

The following VCs have been identified for assessment as part of the Impact Statement:

- Geology and Geologic Hazards
- Soil
- Atmospheric Environment, including air quality and light
- Acoustic Environment, including noise and vibration
- Groundwater
- Surface Water, including surface water quantity, quality, and geochemistry
- Vegetation, Riparian and Wetland Environment, including plant species at risk (SAR):
  - Black ash (not listed under the *Species at Risk Act* (SARA), assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Committee on the Status of Species at Risk in Ontario as threatened)
- Fish and Fish Habitat, including aquatic SAR
  - Lake sturgeon (special concern under SARA)
- Birds and Bird Habitats, including groups of birds and SAR
  - Groups of birds include:
    - Raptors, such as hawks, eagles and falcons
    - Waterfowl, such as ducks, geese and swans
    - Waterbirds, such as loons, gulls and terns
    - Marsh birds, such as grebes, rails, herons and cranes
    - Shorebirds, such as sandpipers, plovers, snipes
    - Forest birds, such as warblers, vireos, thrushes
    - Other land birds, such as owls, swallows and kingfishers
  - SAR include:
    - Species designated as threatened under SARA, including bank swallow, eastern whip-poor-will and eastern meadowlark
    - Species designated as threatened under SARA and assessed by COSEWIC as special concern, including the Canada warbler, common nighthawk, olive-sided flycatcher, bobolink and barn swallow
    - Species of special concern under SARA and assessed by COSEWIC as threatened, including the short-eared owl
    - Species not currently listed under SARA and assessed by COSEWIC as threatened, including lesser yellowlegs

    - Species of special concern under SARA, including yellow rail, rusty blackbird and evening grosbeak
- Wildlife and Wildlife Habitat, including wildlife SAR:
  - Boreal caribou (threatened under SARA)
  - Species designated as endangered under SARA and COSEWIC, including but not limited to the little brown myotis, northern myotis and tri-colored bat, and Blanding's turtle
- Climate Change, including greenhouse gas emissions and carbon sinks
- Health, including biophysical components of health and the social determinants of health
- Social Conditions, including social conditions of Indigenous Peoples and recreation (Big Water Campgrounds and Snowmobile Trail)
- Economic Conditions
- Indigenous Peoples, including Indigenous physical and cultural heritage, the current use of land and resources for traditional purposes, health, social and economic conditions, and the rights of Indigenous Peoples

8.5 Assessment Boundaries

8.5.1 Spatial Boundaries

Spatial boundaries for the assessment were selected based on the geographic extent over which Project activities and their effects on VCs are likely to occur, as well as other ecological, technical, Indigenous knowledge, and social considerations. Three geographic areas have been defined for the assessment of selected VCs:

- **Project Area (PA):** encompasses the Project footprint and is the anticipated area of physical disturbance associated with the construction, operations, and decommissioning of the Project.
- **Local Study Area (LSA):** the area in which Project-related effects (direct or indirect) can be predicted or measured with a meaningful level of accuracy and confidence. The LSAs encompasses the PA and are VC-specific, as they are based on the likely geographic extent by which Project-related effects can be predicted.
- **Regional Study Area (RSA):** the area that establishes the context for determining significance of Project-specific effects. It is also the area within which potential cumulative effects - the residual effects from the Project in combination with those of past, present and reasonably foreseeable projects – may extend. The RSAs encompasses the PA and the VC-specific LSAs, as appropriate.

VC-specific LSAs and RSAs are described and illustrated in each VC chapter (Chapters 10 to 23 and 25 to 28).

A list of federal lands that fall within the LSA or RSA of each VC is provided in the respective VC chapters.

8.5.2 Temporal Boundaries

Temporal boundaries for the assessment address the potential effects during the Project's construction, operations and decommissioning/closure phases over relevant timescales. These temporal boundaries are used in the assessment of residual effects and are also considered applicable for the assessment of cumulative effects. The temporal boundaries apply to all VCs.

The temporal boundary of the assessment includes all Project phases from the start of construction through to the end of closure. Based on the current Project schedule, the Project phases include:

- 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 30): 120 kt/d milling capacity with ore extraction
  - Operations phase 3 (Year 30 to 41): 120 kt/d milling capacity with no ore extraction
- Decommissioning and Closure
  - Active closure (Year 41 to 46)
  - Passive closure (Year 46 +)

Refer to Chapter 3 of the Impact Statement for a detailed description of the project components and activities anticipated to occur during each phase.

8.6 Description of Existing Conditions

Existing conditions for each VC are established based on data collected during baseline studies involving desktop analyses, field programs, consultation and engagement, and Indigenous knowledge studies. An overview of the existing environment is presented using current information about the existing conditions. Influences of past and present projects and physical activities on the VC condition leading to the present time is presented along with a discussion of the current condition of each VC. The existing environmental conditions are described in Chapter 9 of the Impact Statement, with a summary presented in each VC Chapter (Chapters 10 to 23 and 25 to 28). Additional supporting baseline material for the VCs is provided in the baseline reports (see Appendix B of the Impact Statement).

8.7 Effects Assessment Methodology

8.7.1 Identification of Potential Effects and Measurable Parameters

For each VC, one or more measurable parameters were selected to facilitate the measurement of potential effects and Project interactions with the environment, specific to the nature and scope of that VC. Where available, Indigenous knowledge was considered in existing conditions and the identification of potential effects and Project interactions. As a standard practice, baseline conditions were considered in the context of a benchmark against which potential effects were measured to highlight the existing environmental conditions that will experience change through the implementation of the Project.

For each VC, potential effects and measurable parameters, and the rationale for their selection is presented in tabular form as shown in Table 8.1.

Table 8.1 Example of Potential Effects and Measurable Parameters

Potential Effect	Measurable Parameter(s) and Units of Measurement	Notes or Rationale for Selection of the Measurable Parameter
Effect 1	Measurable Parameter 1	Explain the rationale for choosing the effect and the measurable parameter
	Measurable Parameter 2	Explain the rationale for choosing the effect and the measurable parameter
Effect 2	Measurable Parameter 1	Explain the rationale for choosing the effect and the measurable parameter
	Measurable Parameter 2	Explain the rationale for choosing the effect and the measurable parameter

The scope of the factors considered in the Impact Statement are detailed for each VC in its respective chapter, which includes a description of the methods and measurable parameters that were used to assess the VC and address the requirements defined in the TIS Guidelines (Appendix A.1 of the Impact Statement).

8.7.2 Potential Project Interactions with Valued Components

For each VC, a table is used to evaluate potential interactions between the environment and proposed Project activities and components described in Table 2.1 of Chapter 3 of the Impact Statement. The physical activities that may interact with the VC are listed by each Project phase. For each potential effect, the physical activities that may interact with the VC are listed by Project phase, and symbols are used to indicate a potential interaction or no interaction. If no interaction or associated effects are anticipated, further assessment of the interaction is considered unnecessary. If an interaction may occur or could result in an effect of concern, further assessment is warranted and is provided in the respective VC effects assessment section. An example of the potential Project interactions table is provided in Table 8.2.

Table 8.2 Example of Project Interactions Table

Physical Activities	Potential Effect(s) (Prior to Mitigation)			
	[Effect 1]	[Effect 2]	[Effect 3]	[Effect 4]
Construction				
[Activity 1]	–	–	✓	✓
[Activity 2]	✓	✓	–	✓
Operation (Mining and Processing)				
[Activity 1]	✓	–	✓	–
[Activity 2]	–	✓	✓	✓
Decommissioning and Closure				
[Activity 1]	✓	✓	–	✓
[Activity 2]	–	✓	✓	✓
Notes: ✓ = Potential interaction – = No interaction				

8.7.3 Assessment of Effect Pathways

For each potential effect, specific Project activities that may interact with the VC and result in an environmental effect (i.e., a measurable change that may affect the VC) are identified and described. The assessment of effect pathway is presented in the individual VC assessment chapters. Components and activities that do not interact with the VC are also identified and the reason for the lack of interaction is explained.

8.7.4 Mitigation and Enhancement Measures

Mitigation measures that will avoid, eliminate, reduce, or control potential effects, and enhancement measures to increase positive effects, are identified and described for each VC. Technically and economically feasible mitigation and enhancement measures constituting standard practice were considered in the evaluation of Project effects. Mitigation and enhancement may also include VC-specific measures to mitigate VC-specific issues (e.g., habitat offsetting/compensation, replacement, or planned environmental management and response measures).

Proposed mitigation and enhancement measures are identified in each VC chapter (Chapters 10 to 23 and 25 to 28).

8.7.5 Characterization of Residual Project-Related Effects

Following the analysis of environmental, health, social, and economic effects pathways and mitigation measures, the residual effects (i.e., effects that remain after mitigation has been applied) are described. Characterizations of residual effects (i.e., the severity of the effects) are based on the following effects attributes, which, if available and relevant, may be combined with or replaced with quantitative thresholds or benchmarks otherwise:

- Direction: the relative change compared to existing conditions (e.g., positive, adverse, neutral)
- Magnitude: the amount of change in a measurable parameter or variable relative to existing conditions, defined qualitatively for each VC (e.g., negligible, low, moderate, high), or quantitatively, if applicable
- Geographic extent: the geographic area where the residual effect occurs (e.g., PA, LSA or RSA)
- Timing: considers when the residual effect is expected to occur, where relevant to the VC, in an assessment of sensitivity including high (e.g., critical life stage of a species or culturally important time such as a festival), moderate (e.g., effect may occur during the start or end of a critical period), or no sensitivity (not during critical life stage or timing does not affect the VC)
- Duration: the time required until the measurable parameter returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived (e.g., short-term, medium-term, long-term)
- Frequency: identifies how often the residual effect occurs and how often during the Project or in a specific phase of the Project (e.g., single event, multiple irregular events, multiple regular events, continuous)
- Reversibility: pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases (e.g., reversible, or irreversible)

The unique environmental, health, social, and economic characteristics or value of the area, a community, and/or ecosystem that may be affected by the Project and/or whether the VC is important to the functioning of an ecosystem or community of people (resiliency) provides context that takes into consideration existing conditions as well as the results of engagement and Indigenous knowledge.

The above definitions of each term are the default for all VCs but may for some VCs be modified as appropriate to improve the relevant contextualization. A summary of the characterization of residual effects for each VC is provided in the corresponding VC chapters (Chapters 10 to 23 and 25 to 28). An example summary table is provided in Table 8.3.

Table 8.3 Example of Summary of Residual Effects Table

Residual Effect	Residual Effects Characterization							
	Project Phase	**Direction**	**Magnitude**	**Geographic Extent**	**Timing**	**Duration**	**Frequency**	**Reversibility**
Effect Name 1	C, O	N	L	LSA	MS	ST	S	R
Effect Name 2	O, D	P	M	P	NS	MT	R	I

Project Phase
C: Construction
O: Operations
D: Decommissioning and Closure

Direction:
P: Positive
A: Adverse
N: Neutral

Magnitude:
N: Negligible
L: Low
M: Moderate
H: High

Geographic Extent:
PA: Project Area
LSA: Local Study Area
RSA: Regional Study Area

Timing
NS: No sensitivity
MS: Moderate sensitivity
HS: High sensitivity

Duration:
ST: Short-term
MT: Medium-term
LT: Long-term

N/A: Not applicable

Frequency:
S: Single event
IR: Irregular event
R: Regular event
C: Continuous

Reversibility:
R: Reversible
I: Irreversible

8.7.6 Characterizing the Extent of Significance of Adverse Federal Effects

From among the likely effects of the Project, those that are "adverse federal effects" (i.e., adverse effects within federal jurisdiction and any direct or incidental effects) are identified and the extent to which they are considered significant is then determined. As defined in section 2 of the IAA, effects within federal jurisdiction include:

- a change to the following components of the environment that are within the legislative authority of Parliament: fish and fish habitat (as defined in subsection 2(1) of the *Fisheries Act*), aquatic species (as defined in subsection 2(1) of the *Species at Risk Act*), migratory birds (as defined in subsection 2(1) of the *Migratory Birds Convention Act*, 1994), and any other component of the environment that is set out in Schedule 3
- a change to the environment that would occur on federal lands, in a province other than the one where the physical activity is carried out, or outside Canada
- an impact – occurring in Canada and resulting from any change to the environment – to Indigenous peoples, such as to physical and cultural heritage, the current use of lands and resources for traditional purposes or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance
- any change occurring in Canada to the health, social or economic conditions of the Indigenous Peoples of Canada
- any change to a health, social or economic matter that is within the legislative authority of Parliament that is set out in Schedule 3

Direct or incidental effects[1] are defined as effects that are directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of a physical activity or designated project, or to a federal authority's provision of financial assistance to a person for the purpose of enabling that activity or project to be carried out, in whole or in part (IAA 2019).

As such, based on the predicted effects from this Project, and through guidance provided by IAAC, a determination on the extent to which any "adverse residual federal effects" are considered to be significant will be provided for the following VCs:

- fish and fish, including any aquatic SAR (see Chapter 17)
- migratory birds, including any migratory bird species subject to SARA (see Chapter 18)
- health, as it pertains to the health of Indigenous People (see Chapter 21)

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

- social and economic conditions of Indigenous People, including physical and cultural heritage, current use of lands and resources for traditional purposes, any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or the social or economic conditions on reserve (see Chapter 25 to 28)
- wetlands, as they may be impacted through a *Fisheries Act Authorization* or Authorization under the *Metal and Diamond Mining Effluent Regulations* (see Chapter 17)
- navigable waters, as they may be impacted through approvals and/or exemptions under the *Canadian Navigable Waters Act* (see Chapter 22)

Adverse federal effects are characterized using a negligible, low, moderate or high-ranking system, as described in IAAC's *Guidance: Describing Effects and Characterizing Extent of Significance* (2023b).

- Negligible[2] or Low: Effects are likely to be negligible or minor in scale if they are negligible or low in magnitude, of short duration, infrequent, small in spatial extent, reversible or readily avoided, and to generate few or minor impacts in social or ecological contexts. Mitigation measures will allow baseline conditions to remain largely unchanged.
- Moderate: Effects are likely to be medium in scale if they are moderate in magnitude, of moderate duration, occasionally frequent, possibly/partially reversible, and to generate a moderate level of impacts in social or ecological contexts. Mitigation measures may not fully eliminate, reduce, control or offset effects but should enable affected communities to maintain economic and social well-being, and should prevent the diminishment or loss of key components of the environment and its ecological functioning.
- High: Effects are likely to be severe in scale if they are high in magnitude, permanent/long term, frequent, irreversible, and over a large spatial extent or within an area of exclusive/preferred Indigenous use or of ecological/environmental sensitivity. High levels of impacts in social or ecological contexts are expected. There is a high degree of uncertainty of the effectiveness of mitigation measures, or mitigation measures are unable to fully address effects such that valued components are diminished or lost.

While the above describes the final basis of evaluating and concluding extent of significance in this way, these ranks rely on the previous outcomes of the characterization of residual project effects as described above in Section 8.7.5. This 'sliding scale' of the extent of significance (i.e., on a spectrum from low to high) takes into account benchmarks (e.g., thresholds, standards, guidelines, descriptors or objectives, where they exist), criteria (e.g., magnitude, geographical extent, timing, frequency, duration, reversibility and uncertainty), and environmental, health, social and economic conditions specific to each VC. Of note is that an effects attribute conclusion of 'High' magnitude does not necessarily automatically mean a

[2]A "negligible" effect does not mean "no effect" but that an effect is sufficiently small to likely not result in a noticeable change to the valued component. However, in the context of cumulative effects, a negligible effect may be important in understanding regional effects as a whole. For example, while an effect may be negligible on its own, it may be amplified if other physical activities affect the same valued component.

'High' conclusion of extent of significance given how the latter conclusion is dependent on a broader suite of considerations.

Where thresholds are not set by guidelines or regulations, a threshold is developed using the measurable parameters established for the VC, along with professional judgement of the assessors. The thresholds define the limits of a change in a measurable parameter or state of the VC beyond which determines the degree of significance within the ranking system, based on resource management objectives, community standards, scientific literature, or ecological processes (e.g., desired states for fish or wildlife habitats or populations). Quantitative thresholds are preferred; however qualitative thresholds for significance may be used where quantitative thresholds are lacking. Benchmarks are established in advance of the analysis.

The value ascribed to the effect by Indigenous nations and the public are also considered, and conclusions on the extent of significance are informed by a reasonable weighing of all evidence and rationales provided.

8.7.7 Prediction Confidence

The characterization of residual Project effects and residual cumulative effects includes a discussion of the level of confidence in the prediction. Confidence in the prediction is based on professional judgment, prior experience, and scientific certainty relative to:

- quality and quantity of data and the understanding of the effect pathways
- known or estimated effectiveness of the proposed mitigation measures

8.8 Cumulative Effects

The cumulative effects assessment identifies and addresses Project residual adverse effects that are likely to interact cumulatively to result in changes to the environment, health, social, cultural, and economic conditions as the Project's residual effects combine with the effects of other past, existing and reasonably foreseeable projects and physical activities. The approach used for conducting the cumulative effects assessment for the Project is informed by *Policy Framework for Assessing Cumulative Effects Under the Impact Assessment Act* (IAAC 2023a) and the TIS Guidelines.

The assessment takes into consideration historical onsite activities, such past conditions recognized regarding their contribution to current conditions, that combined (past and current) represent conditions against which potential incremental cumulative effects are assessed. The effects of past and current projects relative to conditions prior to onsite activities contribute to these baseline conditions upon which Project effects are assessed. Conditions prior to onsite activities are generally considered to be similar to currently undisturbed areas of the RSA for each VC. Changes in the interim (e.g., after the initiation of any onsite activities to the present day), where relevant, are reflected in the description of existing conditions for each VC. These existing conditions are the basis for the determination of Project-related residual effects and cumulative effects.

Future projects and activities included in the cumulative effects assessment include those that are considered to be certain and reasonably foreseeable, which are those that have been publicly announced with a defined project execution period and sufficient details that allow for a meaningful assessment, are currently undergoing an impact assessment/environmental assessment or permitting process, are identified in an approved development plan, or are approved and under construction (but not yet operational).

Two conditions must be met to initiate an assessment of cumulative effects on a VC:

- the Project is assessed as having adverse residual effects on a VC
- the adverse residual effects from the Project may overlap spatially and temporally with residual effects of other physical activities on a VC

If either condition is not met, an assessment of cumulative effects would not be completed. The temporal overlap between the residual effects of the Project and the residual effects of other physical activities on a VC considers the Project phases and temporal boundaries described in Section 8.4.

The cumulative effects assessment follows the same iterative process and format used for Project effects; an analysis and determination of effect pathways, identification of potential mitigation and enhancement measures, and description of the effect, followed by the characterization of the effect. Information from engagement activities and regulators was also used to inform the cumulative effects assessment. The results of the cumulative effects assessment are described Chapter 29 of the Impact Statement.

8.9 Follow-Up Programs

Following the determination of significance, follow-up and monitoring programs are recommended to verify effects predictions or to assess the effectiveness of proposed mitigation measures. Appropriate monitoring is proposed to inform adaptive management (conceptual information is provided in Chapter 32 of the Impact Statement and in the environmental management and monitoring plans [Chapter 34 of the Impact Statement]). Information sharing obtained from Indigenous nations through the consultation process (discussed in Chapter 7 of the Impact Statement), has been used to inform the follow-up and monitoring program presented in the Impact Statement. These programs will form part of the environmental management and monitoring system for the Project.

If monitoring or follow-up programs detect effects that are different from predicted effects, or the need for improved or modified design features, then adaptive management will be implemented. This may include increased monitoring, changes to plans, or additional mitigation.

8.10 References

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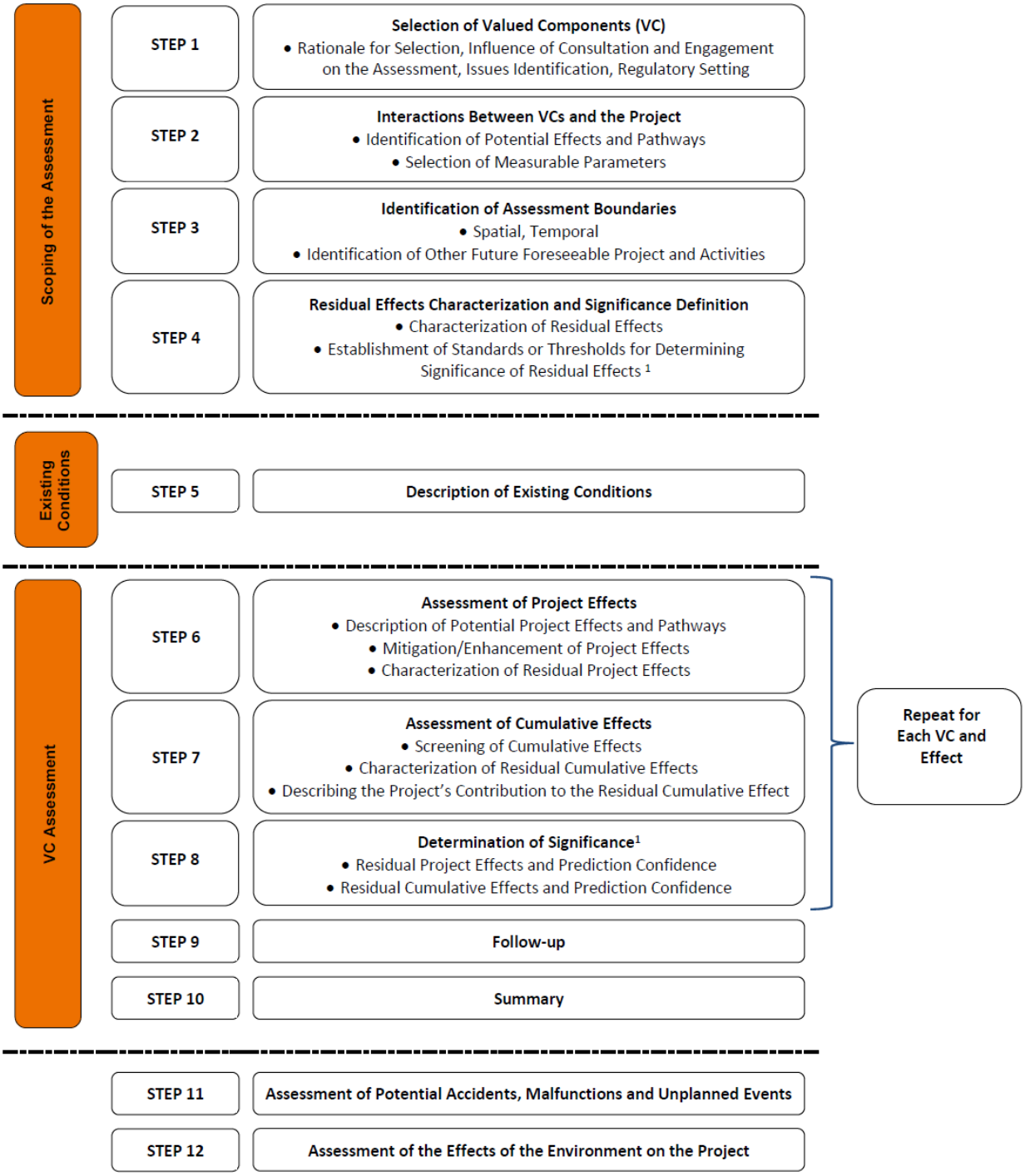
8.11 Figures

Figure 8.1 Summary of Effects Methodology



Note 1: Applies only to the determination of the extent of significance for potential adverse federal effects only.