Backgrounder No.1: Materials to Support Cumulative Effects EA Guidelines Update for the Mary River Project

Introduction:

This backgrounder offers an overview of the assessment of the contribution of the Mary River Project to cumulative effects in Nunavut, to support evaluation of whether updates to the standard guidelines for the Mary River Project are needed in order to ensure future cumulative effects assessments are carried out in a way that reflects current best practice. This backgrounder presents a summary of the approach followed by NIRB to date regarding cumulative effects, a summary of previous assessments for the Mary River Project, the updated approach for CEA provided in the Sustaining Operations Proposal 2 (SOP2) and for future Mary River Project assessment based on stakeholder feedback to date.

Summary of process to update future Mary River Project CEA:

In response to the relevant request from the Responsible Ministers the Nunavut Impact Review Board (NIRB) conducted a Cumulative Effects Assessment Framework Workshop in Iqaluit on February 19-20, 2024. The Ministers requested that "*…the Board host a multi-party workshop in order to establish the components and set the parameters of a comprehensive cumulative effects assessment of the Mary River Project*" (NIRB Registry ID# 347422).

Some participants in the NIRB assessment of the Sustaining Operations Proposal identified a lack of shared understanding and definition of cumulative effects from all parties.

Other parties (in particular Baffinland technical advisors) identified that participants tend to use cumulative effects[1] and combined project[2] effects interchangeably, which is not an approach supported by most literature on environmental assessment methodology. This topic was raised in relation to discussions about the permitting approach to phased development of the Mary River Project based on a series of amendments and whether or not this could result in a reduced understanding the of potential effects of the whole Project once all approved components are built out. Additionally, the potential for factors other than the Mary River Project (including climate change and other foreseeable projects) to impact the reliability of monitoring results and predicted project impacts was raised as a topic of importance.

As requested in the NIRB's *Procedural Guidance* letter from December 15, 2023[3], Baffinland prepared three (3) documents for parties to review prior to the workshop. These included:

- *a written summary of the scope of the Mary River Project to date as approved and as currently constructed and operated, with identification of those approved components and activities not yet implemented;*
- *a listing of the cumulative effects information presented to date through the various assessments of the Mary River Project and subsequent amendments, and a high level summary of Baffinland's predictions and conclusions regarding cumulative effects provided in those assessments; and*
- *identification of monitoring activities in relation to the approved project that are informing Baffinland's ongoing review of the cumulative effects predictions provided in its prior assessments.*

During the workshop Baffinland gave a presentation which provided a summary of the Mary River Project as well as the status of the development of the mine. As well as a comprehensive summary of all the cumulative effects

[1] Inter-project (Cumulative) effects: The combined impacts of a project being assessed *with* other existing or planned developments.
[2] Intra-project (Combined) effects: The interrelationship between different environmental effects *from a single project* on a specific receptor (e.g., how both noise and air quality changes from one project affect a nearby residential area).
[3] NIRB Registry ID# 347752

assessment for the Mary River Project and a summary of monitoring activities. Baffinland, with support from technical advisors answered questions from all parties regarding their concerns with current and previous cumulative effects assessment or monitoring activities. Parties also provided feedback to Baffinland on their expectations and recommendations for how monitoring of cumulative effects for the Project and how the assessment of cumulative effects for future Project proposals could be improved, from their perspectives.

During the workshop a more cohesive list of topics and issues was compiled from the submissions of all parties and the discussion during the open format workshop. These were summarized in the *Cumulative Effects Assessment Framework Workshop Report* prepared by the NIRB (NIRB Registry ID# 349249). This summary identified by participants of the workshop and summarized by NIRB included:

Methodology and screening of valued components

- Some parties shared that screening out Valued Components (VCs) when residual effects were predicted to be "not significant" prevented a full cumulative effects analysis.
- Some parties questioned if assuming mitigation fully eliminated residual effects at the screening stage had the potential to remove VCs that could still experience regional pressures.
- Some parties felt excluding VCs early limited transparency and made it difficult for parties to understand how all components were evaluated.

Spatial and temporal boundaries

- For some parties, geographic study areas used for some VCs were felt to be too narrow to capture regional patterns, migratory ranges, or overlapping stressors.
- Some parties felt temporal boundaries did not extend far enough to capture long term or post-closure cumulative effects, especially for wildlife and environmental recovery.
- Some parties believed the assessment did not sufficiently consider post-closure which created concern that long term cumulative effects were being overlooked.

Integration of Inuit perspectives and rights

- Some parties felt that Inuit perspectives, rights, and IQ were not consistently or meaningfully incorporated into cumulative effects assessment.
- Some parties were concerned that Inuit knowledge was treated as supplementary rather than foundational to understanding cumulative change.
- Some parties identified uncertainty about whether Inuit perspectives should be generated through Baffinland-led processes or provided independently by Inuit organizations.

Transparency, consistency, and alignment with expectations

- Some parties sought clearer, more consistent methods aligned with NIRB expectations for future Mary River Project cumulative effects assessments.
- Some parties felt the previous approach made it difficult to compare Baffinland's assessment with regional studies, government data, or Inuit observations.
- Some parties expressed the view that the methodology did not reflect best practices for cumulative effects assessment in a rapidly changing Arctic environment.

The Workshop served as an opportunity for discussion to allow parties to clarify concerns and discuss a path forward for cumulative effects assessment of future Mary River Project Certificate amendment applications. At that time, the Cumulative Effects Assessment for the Sustaining Operations Proposal 2 Amendment (SOP2) was identified as the next opportunity to apply the updated approach to cumulative effects assessment. Baffinland did update the SOP2 amendment based on the information and discussions shared during the workshop, however the SOP2 was not actively reviewed as it was suspended by Baffinland in October 2024.

Following the workshop, the NIRB formed a committee to guide the development of the CEA framework and ensure a mutual understanding of the terminology, practices, approach and responsibilities for cumulative effects assessment and monitoring.

Current NIRB definition of "Cumulative Effects"

The Nunavut Impact Review Board (NIRB) defines a cumulative impact (or effect) as "the impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Cumulative impacts can also result from individually minor but collectively significant actions taking place over a period of time" (NIRB, 2009; 2020). As outlined in NIRB's Proponent's Guide (NIRB, 2020), "a project proposal causes a cumulative effect if, when the potential impacts associated with the project proposal, when added to other projects in the region, or projects reasonably foreseeable in the region, will cause an additive effect". Proponents of proposed developments subject to review under the *Nunavut Planning and Project Assessment Act* (NuPPAA) are required, as part of their Impact Statement, to present a cumulative effects analysis (CEA) to demonstrate how the effects of their project interacts with the effects of relevant past, present and reasonably foreseeable projects in a regional context (NIRB, 2020).[4]

The CEA approach adopted by Baffinland for the Mary River Project in the FEIS followed NIRB and Agency guidance in effect at that time (Hegmann et al., 1999; NIRB, 2009). As the Mary River Project has evolved since 2012, Baffinland's proposals for project amendments have reconsidered and updated the original CEA where applicable. Both NIRB and the Agency have updated their CEA guidance in recent years (NIRB, 2020; IAAC, 2023), and Baffinland's approach remains consistent with that updated guidance. To date, Project monitoring under the Project Certificate shows that the Mary River Project's contributions to cumulative effects to date have been aligned with FEIS cumulative effects predictions of not significant. A finding of not significant does not eliminate the need for monitoring. Significance determinations predict the likelihood of major impacts, while monitoring verifies FEIS and addendum predictions, manages uncertainty, and ensures mitigation in place is effective.

Baffinland participates in regional government initiatives and programs including federal initiatives aimed at evaluating regional cumulative effects in the Eastern Canadian Arctic and a marine spatial planning exercise should an appropriate regional body lead the initiative. There are currently five (5) marine spatial planning (MSP) areas across Canada. The department of Fisheries and Oceans Canada (DFO) leads the governance of four (4) of the MSP areas and coordinates the fifth with the collaboration of First Nations governments.

Baffinland continues to work with regulatory agencies and local communities to reduce residual effects from the Mary River Project (which in turn the limits the contribution of the Project to cumulative effects) and is committed to participating in collaborative initiatives aimed at managing regional cumulative effects in the Eastern Canadian Arctic.

[4] FEIS (2012), Volume 9, Section 1.0, pg. 1 (NIRB Registry # 286041); ERP (2013), Volume 9, Section 1.0, pg.1 (NIRB Registry # 290872); Phase 2 (2018) TSD-27, Section 1.2, page 1 (NIRB Registry # 320607); SOP (2023) Section 6.9, pg. 246 (NIRB Registry # 344267)

Attachment 1 provides the cumulative effects summary tables from the Mary River FEIS (2012), the Early Revenue Phase (ERP) amendment (2013), the SOP amendment (2023) and the SOP2.

Summary of Previous Cumulative Effects Assessments for the Approved Project

The Mary River Project is operated by Baffinland under Project Certificate No. 005 (as amended to 2023) issued under the Nunavut Agreement and NuPPAA. As part of the initial project proposal for the Mary River Project submitted to the NIRB in 2012, Baffinland prepared a Final Environmental Impact Statement (FEIS), which included a CEA, which screened all Valued Eco-system/Socio-Economic Components (VEC/VSEC) considered in the effects assessment. VEC/VSECs with no predicted project-related residual effects were not carried forward in the CEA since in those cases there would be no mechanism for the Mary River Project to contribute meaningfully to regional cumulative effects. Since 2012, Baffinland has proposed various amendments to the Mary River Project, which have required reconsideration of the Project Certificate and submission of FEIS addenda and applications by Baffinland. Where potential changes in project residual effects were predicted to occur as a result of the amended project proposal, the original CEA conclusions were updated to reflect the outcomes from those updated VEC/VSECs assessments (where there were no predicted changes triggered by the proposed amendments/VSEC conclusions remained the same as and relied on in the approved 2012 FEIS CEA). This Backgrounder provides a summary of the CEAs that have been conducted to date for the Mary River Project (and associated addenda).

The table below includes a listing of the cumulative effects assessments presented as part of the FEIS, FEIS Addendums and NIRB Applications presented in relation to the Mary River Project to date. The years of release are identified, as are the specific volume and/or section references with corresponding NIRB Registry IDs. For a more detailed understanding of any single cumulative effects assessment please review the associated documents by accessing through the NIRB public registry (https://www.nirb.ca/application?strP=r).

Table 1: References to Mary River Project Cumulative Effects Assessments

Document	Year	Cumulative Effects Assessment Reference	NIRB Registry ID
Mary River Project Final Environmental Impact Statement	2012	Volume 9, Section 1, pg. 1- 59	286041
Early Revenue Phase Addendum to the Final Environmental Impact Statement	2013	Volume 9, Section 1, pg. 1-15	290872
Mary River Modification Application – Production Increase, Fuel Storage, and Milne Port Accommodations	2018	No change from ERP	N/A
Phase 2 Addendum to the Final Environmental Impact Statement (not discussed further in memo)	2018 - 2019	Main Document, Section 10.6; pg.10.25 Technical Supporting Document 27, Section 1; pg. 1- 58 Revised Addendum to TSD-27, full memo	320619 320607 325014

Document	Year	Cumulative Effects Assessment Reference	NIRB Registry ID
Production Increase Proposal Extension Request, Supporting Information Summary Report	2020	No change from ERP	N/A
Production Increase Proposal Renewal Application Supplement	2022	No change from ERP	N/A
Mary River Project – Sustaining Operations Proposal Final Environmental Impact Statement Addendum	2023	Section 6.9, pg. 246 - 265	344267

Mary River Project Final Environmental Impact Statement (FEIS)

A CEA was conducted for the Mary River Project FEIS in 2012 (Volume 9) (Baffinland 2012). The CEA approach used for the Mary River Project was developed in accordance with the NIRB Guidelines for the Mary River Project, which are consistent with the Cumulative Effects Assessment Practitioners Guide (Hegmann et al., 1999) published by the Canadian Environmental Assessment Agency (now the Impact Assessment Agency of Canada or the Agency). The Cumulative Effects Assessment Practitioners Guide recognizes that two basic conditions must be met for a CEA to be warranted: "local effects on [Value Components (VCs)] occur as a result of the action under review; and those [VCs] are affected by other actions (i.e., other projects and activities)" (Hegmann et al., 1999). In the Mary River Project FEIS, cumulative effects were assessed when the Mary River Project was predicted to have a potential residual effect (measured or reasonably expected) on a VC and it was reasonably foreseeable that the residual effect of the Mary River Project would interact with the effects of past, present, or future projects or activities in the general region.[5]

Also, in accordance with the *Cumulative Effects Assessment Practitioners Guide (Hegmann et al. 1999),* the CEA presented in the Mary River Project FEIS included the following key steps:

- Scoping
- Analysis of cumulative effects
- Identification of mitigation
- Determination of significance
- Identification of monitoring

This basic five-step approach identified by the Agency in 1999 and adopted by the NIRB was used by Baffinland in the Mary River Project FEIS (and applicable addenda)[6] and remains the foundation of current advice provided by the Agency under the more recent Impact Assessment Act (IAAC, 2023).

[5] FEIS (2012) Volume 9, Section 1.3.4, pg. 44-58 (NIRB Registry # 286041)
[6] FEIS (2012), Volume 9, Section 1.0, pg. 1 (NIRB Registry # 286041); ERP (2013), Volume 9, Section 1.0, pg.1 (NIRB Registry # 290872); Phase 2 (2018) TSD-27, Section 1.2, pg. 1 (NIRB Registry # 320607); SOP (2023) Section 6.9, pg. 246 (NIRB Registry # 344267)

As part of the CEA scoping phase, Baffinland identified applicable VCs (Valued Ecosystem Components [VECs] and Valued Socio-economic Components [VSECs]), spatial and temporal boundaries, and other projects and activities, which could potentially have residual effects that could combine with residual effects of the Mary River Project and result in cumulative effects.

All of the VCs selected for the assessment of project effects were screened for selection in the CEA. However, VCs with no predicted project-related residual effects were not carried forward in the CEA since in those cases there would be no mechanism for the Mary River Project to have a cumulative effect. Table 2 presents the VCs and key indicators (along with associated spatial boundary) carried forward in the CEA for the Mary River Project FEIS. Table 3 presents the VC's and key indicators excluded into the CEA with rationale for the Mary River Project FEIS.

Table 2: Valued Ecosystem Component and Valued Socio-economic Components and Key Indicators selected for the 2012 FEIS CEA of the Mary River Project

VEC/VSEC	Key Indicator(s)	2012 Rationale for Inclusion in CEA	Spatial Boundary
Climate change	Greenhouse gas emissions	GHG emissions from a single project are typically negligible, but climate change is a cumulative effect arising from global GHG emissions	Nunavut Settlement Area (NSA)
Air quality	Air quality	The Project can contribute cumulatively to local air quality effects only	Air quality Local Study Area (LSA)
Noise	Noise levels	The Project can contribute cumulatively to local noise effects only	Noise LSA
Vegetation	Abundance and diversity Plant health Culturally valued plants	The Mary River Project combined with additional development within the terrestrial RSA has the potential to cumulatively affect vegetation	Terrestrial Regional Study Area (RSA)
Migratory birds and habitat	Peregrine falcon; Snow geese; King and Common eider; Lapland Longspur; Red-throated loon	The Mary River Project combined with additional development within the terrestrial RSA has the potential to cumulatively affect bird key indicators	Terrestrial RSA
Terrestrial mammals and habitat	Caribou	The Mary River Project combined with additional development within the range of the herd has the potential for cumulative effects	Range of North Baffin Caribou Herd
Freshwater quantity and quality	Water quantity; Water quality	The Project can contribute cumulatively to local water quantity and quality effects only	Freshwater LSA's

VEC/VSEC	Key Indicator(s)	2012 Rationale for Inclusion in CEA	Spatial Boundary
Freshwater biota	Arctic char	Separation Lake Hydroelectric Project[7] would cross the RSA	Freshwater RSA
Sea ice	Landfast ice	Icebreaking may occur from other projects but only contribute cumulatively to local effects on ice	Marine LSA
Marine water and sediment quality	Marine water and sediment quality	Ore throughput at port sites contribute cumulatively at the local level only	Marine LSA
Marine habitat and biota	Marine habitat; Arctic char health; Invasive species introduction	Ore throughput at port sites contribute cumulatively at the local level only	Marine LSA
Marine mammals	Ringed seals; Bearded seals; Walrus; Beluga whale; Narwhal; Bowhead whale; Polar bear	Shipping and harvesting throughout the marine RSA have the potential to cumulatively affect marine mammals	Marine RSA
Population Demographics	Demographic stability	The Mary River Project and additional projects drawing employment from the same communities could cumulatively affect demographic stability through in- or out-migration	North Baffin LSA
Human health and well-being	Substance abuse Community and social stability	The Mary River Project and additional projects could draw employment from the same communities, affecting the availability of abused substances	North Baffin LSA
Community infrastructure and services	Competition for skilled workers	The Mary River Project could compete for workers within the direct-hire communities, adversely affecting staffing to provide community services	North Baffin LSA
Cultural Resources	Archaeology	The Mary River Project combined with additional development within the RSA has the potential for cumulative effects	RSA
Land and resource use	Inuit Harvesting, Travel and Camps	The Mary River Project combined with additional development within the land use study area has the potential to cumulatively affect land use	Land Use Study Area

[7] The Separation Lake Hydroelectric Project was a project considered by Baffinland in the 2012 FEIS to service the electrical needs of the Mary River Project and considered as part of the CEA.

Table 3: Valued Ecosystem Component and Valued Socio-economic Components and Key Indicators excluded (with rationale) from the 2012 FEIS CEA of the Mary River Project

VEC/VSEC	Key Indicator(s)	2012 Rationale for Exclusion in CEA
Vibration	Vibration levels	Residual effects for vibration are considered to be minimal.
Landforms, soil and permafrost	Sensitive landforms	No residual effect (disturbance of sensitive landforms) after mitigation
Migratory birds and habitat	Thick-billed Murre Species at risk: Ivory gull; Ross Gull; Red Knot; Harlequin Duck; Short Eared owl	Thick-billed Murre: No residual effects expected. Colonies are being avoided. Ivory and Ross's Gull: Observations rare within Project RSA, no residual effects expected. Red Knot: Field studies have not documented the species within the terrestrial RSA, no residual effects expected Harlequin Duck: No observations of the species in typical breeding habitat, no residual effects expected. Short-Eared Owl: Limited observations in Terrestrial RSA and not since 2007, no nesting confirmed or suspected in typical habitat, no residual effects expected.
Education & Training	Life skills Education and skills	Significant positive residual effect assessed. Only negative residual effects were scoped into CEA.
Livelihood and Employment	Wage employment Job progression and career advancement	Significant positive residual effect assessed. Only negative residual effects were scoped into CEA.
Economic Development and Self-reliance	Land People Community economy Territorial economy	Significant positive residual effect assessed. Only negative residual effects were scoped into CEA.
Contracting and business opportunities	Opportunities for businesses	Significant positive residual effect assessed. Only negative residual effects were scoped into CEA.
Cultural well-being	Cultural well-being	No adverse residual effects were assessed with regard to Cultural Well-Being.
Benefits, taxes and royalties	Territorial own source revenues	Significant positive residual effect assessed. Only negative residual effects were scoped into CEA.

VEC/VSEC	Key Indicator(s)	2012 Rationale for Exclusion in CEA
Governance and leadership	Governance and leadership	Significant positive residual effect assessed. Only negative residual effects were scoped into CEA.

The Nunavut Settlement Area (NSA) boundary was adopted for the spatial boundary of the CEA since it represented a sufficiently large scale to identify other projects or activities that could reasonably be foreseen to interact with the Mary River Project and also represented the NIRB's administrative boundary. Shipping to and from the Raglan Mine in the Nunavik region of Quebec was also included in the CEA spatial scope. Specific regional and local study areas were also identified on a case-by-case basis for each Valued Component (VC), as applicable. See Figure 1 below for the overview of the marine and terrestrial LSAs and RSAs.

Temporal boundaries for the CEA considered the lifespan of the Mary River Project (2004 to 2045) and were inclusive of the lifespan of other projects and activities, where known or reasonably foreseeable (e.g., start of industrial development in northern Baffin Island) and therefore were indicated to span from approximately 1975 to 2045).

Other projects and activities considered in the CEA included other past, current or future activities proposed by Baffinland (e.g., previous exploration and bulk sampling programs; proposed monitoring programs concurrent with the Project); climate change; communities; traditional and recreational hunting, fishing and foraging; tourism and commercial recreation activities; designated conservation areas; and other past, current or future projects/activities proposed by other proponents. Other projects and activities included: mining and mineral exploration activities; marine transport/ shipping (including a naval refuelling station); air transport; military exercises and monitoring programs (e.g., DEW-line decommissioning); and hydroelectric facilities.[8]

Potential effects of those other projects and activities were considered in combination with predicted residual effects of the Mary River Project. Mitigation identified to address possible cumulative effects were primarily mitigation measures previously identified to reduce and manage potential adverse effects of the project. Possible cumulative effects were identified for several VCs, particularly caribou and marine mammals. With the exception of marine mammals, most potential cumulative effects identified were the result of potential interactions with projects that may be induced by the Mary River Project (development of Deposits No. 2 to 9 or the Separation Lake hydroelectric project) and other potential industrial activities within the boundaries of the assessment. Cumulative effects were predicted to be not significant for all VCs, primarily due to the geographic extent of
effects of the Mary River Project and distance from other projects and activities, resulting in limited overlap of residual effects in space and time. No additional follow-up or monitoring was proposed to address cumulative effects specifically. However, all VCs were included for Project-specific effects monitoring. Baffinland's participation in collaborative initiatives with the Qikiqtaaluk Socio-Economic Monitoring Committee was identified to help monitor the potential for socio-economic related cumulative effects.

[8] FEIS (2012) Volume 9, Section 1.4, pg. 44-58 (NIRB Registry # 286041)

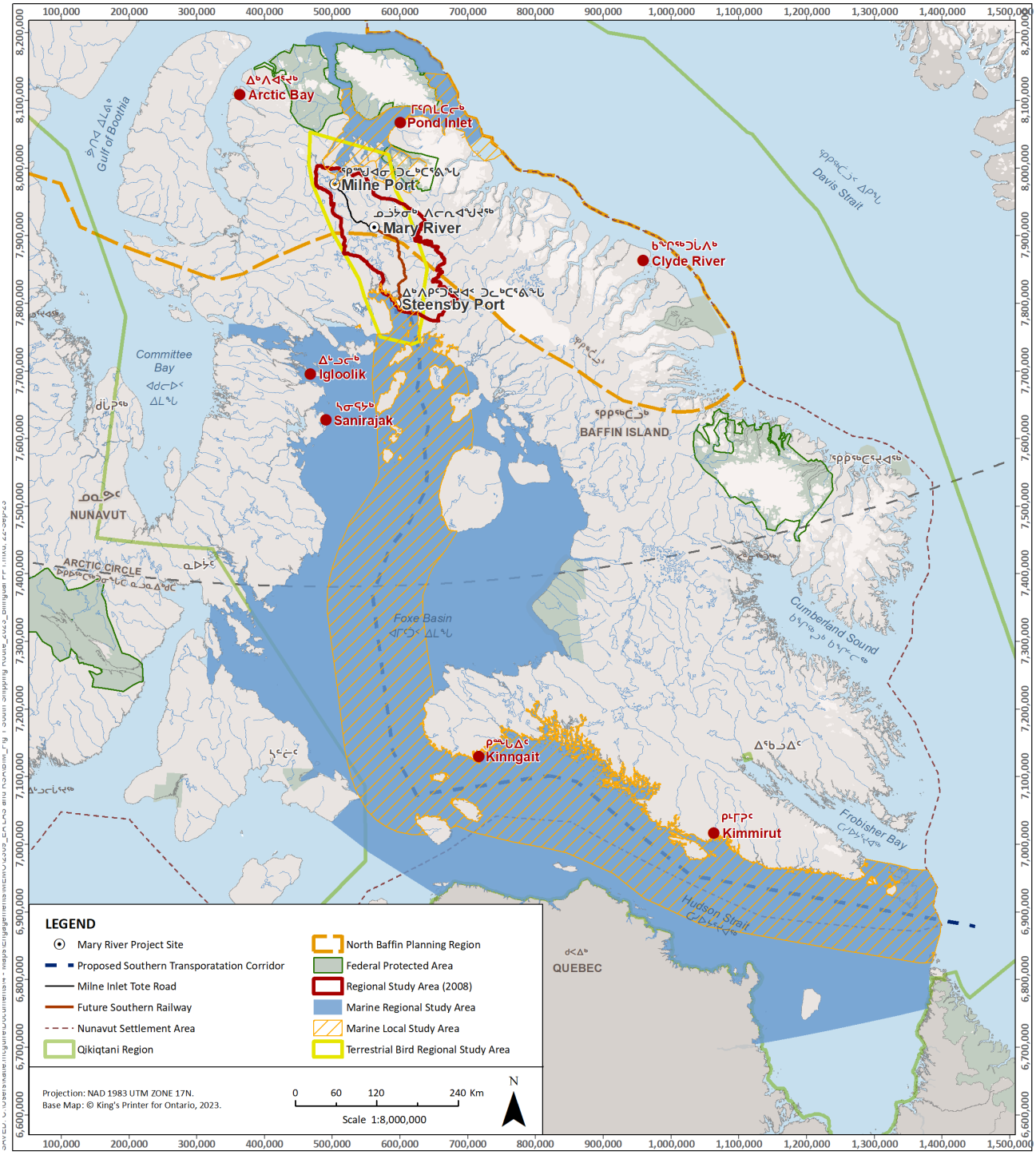

Figure 1: Marine and Terrestrial Local and Regional Study Areas[9]

[9] Figure 1 depicts the geographic boundaries used for the FEIS, ERP, PIP, PIPE, PIP Renewal and SOP.

Amendments to the Mary River Project 2013-2026

Early Revenue Phase-FEIS Addendum (Amendment 1 - 2013)

In 2013, due to various business drivers, Baffinland proposed to add transportation of ore through the Northern Transportation Corridor. This Early Revenue Phase (ERP) proposal involved the extraction of iron ore from the Mine Site to be transported by truck along the existing Tote Road and shipped from Milne Port to primarily European markets. Baffinland submitted an Addendum to the FEIS (ERP FEIS Addendum) (Baffinland, 2013), updating the FEIS as appropriate to account for the modification in activities.

As part of the ERP, the CEA was reviewed and updated to acknowledge changes in predicted project residual effects compared to what was assessed in the FEIS. Additional projects and activities considered in the ERP included the reasonably foreseeable future Bathurst Inlet Port and Road Project and changes in forecasted shipping activities through Milne Inlet and into Baffin Bay.

The CEA presented in the ERP FEIS Addendum concluded that there was limited potential overlap between the ERP and other projects and undertakings, including the approved Mary River Project and the Southern Transportation Corridor (previously assessed in the FEIS and approved as part of the Mary River Project). The ERP FEIS Addendum presented no changes in predicted cumulative effects, with the exception of the Sea Ice (no icebreaking required for Northern Transportation Corridor, but icebreaking was assessed in the FEIS for the Southern Transportation Corridor), and Marine Water and Sediment Quality (in recognition of the modification of the project footprint at Milne Port). Where overlap of residual effects occurred and potential cumulative effects were identified, the effect of the ERP in combination with other projects and undertakings was predicted to remain not significant (Baffinland, 2013).[10]

Amendment 1 was approved by the Minister in 2013, with support from QIA and other participants in the process.

Production Increase Amendments (Amendments 2 (2019), 3 (2020), 4) (2022)

The potential for cumulative impacts were considered in relation to the Production Increase Proposal (PIP) proposed by Baffinland in 2018 as part of the modified activities assessment against the significant impact factors included at Section 90 of NuPPAA. It was determined the PIP represented an incremental increase to a nominal trucking and shipping (increase from 4.2 Mtpa to 6 Mtpa), but included no new activities or added infrastructure beyond those assessed for the ERP, and was planned to be a temporary change to the Mary River Project (2018). For the same reasons, no CEA update was conducted for the Production Increase Proposal Extension (PIPE) (2020) or the Production Increase Proposal Renewal (PIP Renewal) (2022) which were intended to temporarily extend the current trucking and shipping activities using the Northern Transportation Corridor at a level of 6 Mtpa.

Amendments 2, 3 and 4 were approved by the Minister, with support from QIA and other participants in the process.

Sustaining Operations Proposal (Amendment 5 2023)

The Sustaining Operations Proposal (SOP) involved maintaining the Northern Transportation Corridor with a nominal trucking and shipping rate of 6 Mtpa with no new activities or added infrastructure, (as approved for the ERP, PIP, PIPE and PIP Renewal) but extended the timeframe of the use of Northern Transportation Corridor (2023-2024).

The SOP application included an updated CEA using the same methods and approach used to assess the cumulative effects of the original FEIS (Baffinland 2012), and the ERP FEIS Addendum (Baffinland 2013). All VCs evaluated in the project-specific effects assessment were considered and screened for inclusion in the CEA. VCs for which residual

[10] ERP (2013), Volume 9, Section 1.4, Table 9-1.4 *Cumulative Effects Summary* (NIRB Registry # 290872)

effects were predicted to occur were carried through the CEA. Spatial and temporal boundaries for the CEA were established in consideration of boundaries used in the previous CEAs. Although the scope of the SOP application was primarily focused on a temporal extension of activities previously approved through the ERP, PIP, PIPE and PIP Renewal applications, the SOP CEA provided an update to the CEA presented for the ERP (Baffinland, 2013) and therefore considered the increase in trucking and shipping levels from 4.2 Mtpa to a nominal rate of 6 Mtpa.

As was the case for the previous CEAs, the overall spatial boundary for identification of other projects and activities for the CEA remained the NSA. However, the expected zone of influence of residual effects within the RSA was considered on a case-by-case basis for each VC when determining whether there was spatial overlap of effects and thus potential for cumulative effects. The temporal boundaries for the SOP CEA were consistent with the temporal boundaries used in the CEAs presented in the FEIS and ERP FEIS Addendum which considered the lifespan of the Mary River Project as well as the lifespan of other projects and activities within the NSA. The ERP FEIS Addendum concluded that there was limited potential overlap between the ERP and other projects and undertakings, including the Mary River Project and the southern transportation corridor (as initially assessed and approved). Where overlap of residual effects occurred, the effect of the ERP in combination with other projects and undertakings was predicted to remain negligible and not significant.[11] The SOP resembled the scope of the ERP (with an incremental increase to nominal rate of 6 Mtpa) without any additional new activities or added infrastructure.

Additionally, the SOP CEA considered changes in residual effects from the PIP (and inherently the PIPE and PIP Renewal) and the SOP in combination with residual effects from other past, present and/or reasonably foreseeable projects and activities (including all approved Mary River Project activities and components). Other projects and activities with potential residual effects that could potentially overlap with residual effects of the SOP were carried forward in the assessment and potential cumulative effects were evaluated for applicable VCs in consideration of proposed mitigation and monitoring programs. The method of assessing significance of cumulative effects remained the same as assessing project-specific residual effects.

Importantly, the SOP application included environmental effects monitoring results (some of which pre-dated operation of the Mary River Project) which helped to verify residual project effects predictions and the effectiveness of mitigation measures including the need for adaptive management. The results of effects monitoring informed the effects assessment of the SOP, including the CEA. Several additional mitigative commitments were made by Baffinland as part of the SOP and it holds that the implementation of these mitigation measures would reduce the project's contribution to adverse cumulative effects. The CEA presented in the SOP application concluded that cumulative effects of the SOP in combination with other projects and activities would be not significant.

Amendment 5 was approved by the Minister in 2023, with support from QIA and other participants in the process.

Sustaining Operations Proposal 2 (SOP2) Approach to Cumulative Effects (based on CEA Workshop Feedback)

The Cumulative Effects Assessment presented in the SOP2 FEIS Addendum reflects the approach committed to by Baffinland at the February 2024 NIRB Cumulative Effects Workshop, as described in the NIRB Report (NIRB Registry ID# 349249). The overall scope and approach to the CEA for SOP2 is based on feedback received from Inuit communities, the QIA and other parties on past CEAs for the Mary River Project, NIRB guidelines and best practices and the professional judgement of the Study Team. Most comments and recommendations provided to date on the topic of improving CEA for the Mary River Project related to the scope of the CEA, including but not limited to: spatial and temporal boundaries; identification of VCs for assessment; other projects and activities whose residual effects

[11] ERP (2033), Volume 9, Section 1.4, Table 9-1.4 *Cumulative Effects Summary* (NIRB Registry # 290872)

may interact cumulatively with residual effects of the Mary River Project; and scope of the Mary River Project and future development scenarios.

The importance of IK, IQ and community engagement in the CEA process has also been highlighted, with priorities such as Indigenous rights and health of wildlife populations, ecosystem integrity, culture and socio-economic well-being of communities. Where western science is referenced, IQ knowledge and perspectives are also recognized in order to help present a balanced approach in assessment. Regardless of significance determinations for cumulative effects, monitoring will continue to take place (with updates as appropriate) within Baffinland's adaptive management framework.

The importance of climate change is also highlighted in the CEA. While included as a VC itself, climate change is also recognized as a stressor on other VCs, potentially changing the environmental conditions within which cumulative effects may occur in the future (e.g., potentially inducing changes in sea ice and food webs resulting in additional cumulative stressors on marine mammals).

One of the more apparent changes from previous CEAs conducted for the Mary River Project is the presentation of the CEA itself. To encourage a holistic effects assessment that is more centered around the VCs, the CEA was integrated within the VC chapters of this SOP2 FEIS Addendum. Previous CEAs conducted for the Mary River Project were presented as stand-alone assessments.

Spatial and Temporal Boundaries

Spatial and temporal boundaries used for the assessment of cumulative effects expand on those boundaries established for the assessment of project-related effects. As was the case for the previous CEAs, the largest spatial boundary for identification of other projects and activities for the CEA remains the NSA. Spatial boundaries for the CEA are defined on a case by case basis for each VC. In most cases, the spatial boundary for the CEA is the VC-specific RSA boundary. However, for select physical VCs (Air Quality, Noise and Vibration) there was no defined RSA boundary and so the LSA is used for the CEA. In these cases, the LSA is the largest spatial boundary, considering the physical nature of the VC and the geographic extent of its measurable effects. Potential effects of changes on these physical VCs on receptors in the terrestrial, freshwater, marine and/or human environments are addressed as applicable within those respective RSAs.

Baffinland also recognizes that for some biological VCs, the geographic range of the species is relevant to understand potential stressors which may be acting on the species outside the respective RSA and potentially contributing to adverse cumulative effects. Although baseline and EEM data has not been collected for the Mary River Project outside the respective RSAs, where applicable and available (e.g., migratory species), general information on VC presence and stressors outside the respective RSAs is included to the extent it may inform the CEA.

Identification of Valued Components

In a regulatory, project-based CEA, it is standard practice to consider all VCs evaluated in the project-specific effects assessment but scope out VCs for which there were no predicted residual effects from the project. However, a different approach has been taken for the SOP2 Addendum, in response to feedback from QIA, NTI and others where the recommendation was to carry all VCs identified by participants for the project-specific effects assessment through the CEA.

Other Projects and Activities

Other projects and activities within the NSA that were screened as potentially interacting with VCs that could also experience residual effects of SOP2 and/or the Approved Project. These projects and activities were identified based on past CEAs conducted for the Mary River Project, with updates made based on review of the NIRB Project Registry,

recommendations made as part of the CEA Framework Workshop (2024) and professional judgement of the Study Team. This list includes past projects that have been carried out, current and ongoing projects and activities, and certain and reasonably foreseeable future projects and activities. NIRB (2009) defines reasonably foreseeable projects as those that are currently under regulatory review, or that will be submitted for regulatory review in the near future, as determined by the existence of a proposed project description, of letter of intent, or any regulatory application filed with an authorizing agency. Baffinland has adopted a similar standard for the practical purpose that without certain advancement and public disclosure of details relating to a future other project, it is difficult to understand its potential interactions with this Proposal. Baffinland has also included induced projects or activities which are more likely to occur if SOP2 or Approved Project proceeds.

Projects and activities include mining and mineral exploration; pits and quarries; military activities; transportation; tourism; protected areas; communities; monitoring and research; commercial fisheries; and natural events (e.g., climate change). Potential effects of these projects and activities, in recognition of spatial and temporal overlap with predicted effects of the Mary River Project, and more specifically SOP2, were considered as appropriate within the respective VC CEAs. In many cases, there is little to no spatial overlap of biophysical effects given the geographic separation of the Mary River Project from other projects and activities. However, these projects and activities may contribute to biophysical and/or socio-economic effects within the larger RSAs (which in some cases is the NSA itself). Attachment 2 provides the table of *Other Projects and Activities with the Potential to Interact Cumulatively with the Mary River Project* from the SOP2.

The Approved Project is not included in the assessed projects and activities as effects of SOP2 in combination with the Approved Project (e.g., construction and operation of the Steensby Railway and Steensby Port) are assessed as combined effects. However, ongoing mineral exploration and future development plans (e.g., Deposits 2 and 3) are considered in the CEA as Certain and Likely Foreseeable Future Projects and Activities with Deposits 4 to 9 considered as potential future induced projects.

Potential Updated Approach for Future Mary River Project Cumulative Effects Assessments:

The Mary River Project guidelines on cumulative effects assessments could be updated to align with the approach undertaken for the SOP2 assessment. This approach is detailed in the section above. This option will be the focus of further collaborative consideration and discussion through the CEAF process.

REFERENCES

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IAAC (Impact Assessment Agency of Canada). 2023. Policy Framework for Assessing Cumulative Effects under the Impact Assessment Act. May 2023.

NIRB (Nunavut Impact Review Board). 2009. Guidelines for the Preparation of an Environmental Impact Statement for Baffinland Iron Mines Corporation's Mary River Project (NIRB File No. 08MN053). Dated November 16, 2009.

NIRB (Nunavut Impact Review Board). 2020. Proponent's Guide. NIRB Technical Guide Series. February 2020.

Attachment 1

Mary River Cumulative Effects Summary

Table 9-1.4 Cumulative Effects Summary

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	Direction	Mitigation Measure (s)	Magnitude	Duration	Frequency	Extent	Reversibility	
GREENHOUSE GASES								
Greenhouse gas emissions	Negative	Reduce project emissions to the extent possible	Level 1 - minor in relation to global emissions	Level II - life of mine	Level III - Continuous	Level III - beyond the RSA	Level III - irreversible	Not Significant
AIR QUALITY								
Air quality emissions of criteria of concern (COC) at the Mine Site from concurrent development of Deposits No. 2 and/or 3	Negative	Implement air quality abatement measures, in Project design and/or as adaptive management	Level II, possibly Level III	Level II - life of mine	Level III - Continuous	Possibly Level II for some parameters, based on current project	Level I - reversible	Not Significant
Air quality emissions of criteria of concern (COC) along the Milne Inlet Tote Road or Railway, from concurrent development of Deposits No. 2 and/or 3, or development of other deposits in the region that utilize the tote road or railway	Negative	Implement air quality abatement measures, in Project design and/or as adaptive management	Level II, possibly Level III	Level II - life of mine	Level III - Continuous	Possibly Level II for some parameters, based on current project	Level I - reversible	Not Significant
Air quality emissions of criteria of concern (COC) at Milne Port or Steensby Port from larger tonnages of ore handled through the port sites, from concurrent development of Deposits No. 2 and/or 3, or development of other deposits in the region, and construction of the Separation Lake hydroelectric site staged from Steensby Port	Negative	Implement air quality abatement measures, in Project design and/or as adaptive management	Level II, possibly Level III	Level II - life of mine	Level III - Continuous	Level I, or possibly Level II	Level I - reversible	Not Significant

Table 9-1.4 Cumulative Effects Summary (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	Direction	Mitigation Measure (s)	Magnitude	Duration	Frequency	Extent	Reversibility	
NOISE								
Increased noise within the noise study areas of each of the Project sites, resulting from an increased mining production rate and construction of the Separation Lake hydroelectric project (applicable to Steensby Port)	Negative	Implement noise abatement measures, in Project design and/or as adaptive management	Level I for main Project, could increase to Level II with additional activities	Level II - life of mine	Level III - Continuous	Level I, or possibly Level II	Level I - reversible	Not Significant
VEGETATION								
Reduction in vegetation abundance and diversity within the terrestrial RSA	Negative	Minimize area of disturbance	Level I - Effect expected to be indistinguishable from natural variation	Level III - beyond life of the Project (permanent)	Level I - Infrequent	Level I - will occur within the PDA	Level II - partially irreversible (some natural regeneration will occur, post-closure)	Not Significant
Reduction in vegetation health due to deposition of dust and metals in soil	Negative	Dust suppression	Level I - Effect expected to be indistinguishable from natural variation	Level III - beyond life of the Project (permanent)	Level III - Continuous	Level I, or possibly Level II	Level III - irreversible	Not Significant
Reduction in culturally valued vegetation (represented by blueberries)	Negative	Minimize area of disturbance	Level I - Effect expected to be indistinguishable from natural variation	Level III - beyond life of the Project (permanent)	Level III - Continuous	Level I, or possibly Level II	Level III - irreversible	Not Significant

Table 9-1.4 Cumulative Effects Summary (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	Direction	Mitigation Measure (s)	Magnitude	Duration	Frequency	Extent	Reversibility	
TERRESTRIAL WILDLIFE AND HABITAT								
Reduction in caribou habitat	Negative	Minimize area of disturbance; manage dust emissions; minimize noise and other sources of sensory disturbance	Level I - Effect expected to be indistinguishable from natural variation	Level III - beyond life of the Project (permanent)	Level III - Continuous	Level III - confined to RSA	Level II - partially irreversible (some natural regeneration will occur, post-closure)	Not Significant
Reduction in caribou movement	Negative	Utilize existing transportation corridors for future development activities	Level I - Effect expected to be indistinguishable from natural variation	Level II - life of mine	Level III - Continuous	Level III - confined to RSA	Level I - reversible	Not Significant
Caribou mortality	Negative	Apply mitigation in current Project to minimize potential for additional mortality	Level I - Effect expected to be indistinguishable from natural variation	Level II - life of mine	Level I - Infrequent	Level II - confined to LSA	Level I - reversible	Not Significant
Migratory birds	Negative	Apply mitigation in current Project to minimize potential for additional mortality	Level I - Effect expected to be indistinguishable from natural variation	Level II - life of mine	Level I - Infrequent	Level II - confined to LSA	Level I - reversible	Not Significant
FRESHWATER QUANTITY AND QUALITY								
Doubling of water takes from water supply lakes at Milne Port, the Mine Site and Steensby Port	Negligible	No mitigation required - water taking is below thresholds	Level I - Effect expected to be indistinguishable from natural variation	Level II - life of mine	Level III - Continuous	Level II - confined to LSA	Level I - reversible	Not Significant

Table 9-1.4 Cumulative Effects Summary (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	**Direction**	**Mitigation Measure (s)**	**Magnitude**	**Duration**	**Frequency**	**Extent**	**Reversibility**	
Increased loading of runoff from mining areas into the Mary River	Negative	Water management (diversion to alternate receiving waters) or water treatment, if necessary	Level II - Effect expected to be moderate magnitude following mitigation, meeting compliance requirements of water licence, fisheries authorization and aquatic effects monitoring (MMER) requirements.	Level II - life of mine	Level II - Intermittent	Level II - confined to LSA	Level I - reversible	Not Significant
FRESHWATER FISH								
Effects to Arctic char health and habitat resulting from water quality effects	Negative	Mitigation to be identified within an authorization under the *Fisheries Act*. Compliance with water licence and aquatic effects monitoring under the MMER.	Level I - Effects expected to be low magnitude after mitigation	Level II - life of mine	Level II - Intermittent	Level II - confined to LSA	Level I - reversible	Not Significant
SEA ICE								
Disruption of fast ice (ringed seal habitat)	Negative	Confine ice breaking to narrow corridor to manage disturbance of fast ice to less than 10 % threshold	Level II - Effect expected to approach but not exceed established threshold.	Level II - life of mine	Level III - Continuous	Level II - confined to LSA	Level I - reversible	Not Significant

Table 9-1.4 Cumulative Effects Summary (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	**Direction**	**Mitigation Measure (s)**	**Magnitude**	**Duration**	**Frequency**	**Extent**	**Reversibility**	
Changes to marine water quality at port sites due to more frequent shipping and discharge of ballast water	Negative	Ballast water exchange as required by law	Level I - Effects expected to be low magnitude after mitigation	Level II - life of mine	Level II - Intermittent	Level II - confined to LSA	Level I - reversible	Not Significant
Effects to marine biota, including Arctic char, due to potential water and sediment quality changes.	Negligible	Apply mitigation for water and sediment quality	Level I - Effects expected to be low magnitude after mitigation	Level II - life of mine	Level II - Intermittent	Level II - confined to LSA	Level I - reversible	Not Significant
RINGED SEAL								
Increased disruption of fast ice in Steensby Inlet	Negative	Confine ice breaking to narrow corridor to manage disturbance of fast ice to less than 10 % threshold	Level II - Effect expected to approach but not exceed established threshold	Level II - life of mine	Level III - Continuous	Level II - confined to LSA	Level I - reversible	Not Significant
BEARDED SEAL								
Habitat change, disturbance, and masking.	Negative	Apply mitigation in current Project	Level I - low (habitat change); Level II - moderate (disturbance, masking)	Level II - life of mine	Level III - Continuous	Level II - confined to LSA	Level I - reversible	Not Significant
WALRUS								
Habitat change, disturbance, and masking.	Negative	Apply mitigation in current Project	Level I - low	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA	Level I - reversible	Not Significant

Table 9-1.4 Cumulative Effects Summary (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	Direction	Mitigation Measure (s)	Magnitude	Duration	Frequency	Extent	Reversibility	
NARWHAL								
Habitat change, disturbance, and masking.	Negative	Apply mitigation in current Project	Level I - low (habitat change); Level II - moderate (disturbance, masking)	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA; possibly Level II - beyond the LSA and within the RSA	Level I - reversible	Not Significant
BELUGA WHALE								
Habitat change, disturbance, and masking.	Negative	Apply mitigation in current Project	Level I - low (habitat change); Level II - moderate (disturbance, masking)	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA; possibly Level II - beyond the LSA and within the RSA	Level I - reversible	Not Significant
BOWHEAD WHALE								
Habitat change, disturbance, and masking.	Negative	Apply mitigation in current Project	Level I - low (habitat change); Level II - moderate (disturbance, masking)	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA; possibly Level II - beyond the LSA and within the RSA	Level I - reversible	Not Significant
POLAR BEAR								
Habitat change, disturbance, and possibly mortality.	Negative	Apply mitigation in current Project	Level I - low	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA	Level I - reversible	Not Significant

NOTE(S):
1. CACs = CRITERIA AIR CONTAMINANTS [TSP, PM10, PM2.5, SO2, NO2, CO, Fe, Mn, As, Ca, Co and POI (potential acid input).

Table 9-1.4 Cumulative Effects Summary (Change)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	Direction	Mitigation Measure (s)	Magnitude	Duration	Frequency	Extent	Reversibility	
GREENHOUSE GASES								
Greenhouse gas emissions	No change	No change	No change	No change	No change	No change	No change	Not Significant
AIR QUALITY								
Air quality emissions of criteria of concern (COC) at the Mine Site from concurrent development of Deposits No. 2 and/or 3	No change	No change	No change	No change	No change	No change	No change	Not Significant
Air quality emissions of criteria of concern (COC) along the Milne Inlet Tote Road or Railway, from concurrent development of Deposits No. 2 and/or 3, or development of other deposits in the region that utilize the tote road or railway	No change	No change	No change	No change	No change	No change	No change	Not Significant
Air quality emissions of criteria of concern (COC) at Milne Port or Steensby Port from larger tonnages of ore handled through the port sites, from concurrent development of Deposits No. 2 and/or 3, or development of other deposits in the region, and construction of the Separation Lake hydroelectric site staged from Steensby Port	No change	No change	No change	No change	No change	No change	No change	Not Significant

Table 9-1.4 Cumulative Effects Summary (Change) (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	Direction	Mitigation Measure (s)	Magnitude	Duration	Frequency	Extent	Reversibility	
NOISE								
Increased noise within the noise study areas of each of the Project sites, resulting from an increased mining production rate and construction of the Separation Lake hydroelectric project (applicable to Steensby Port)	No change	No change	No change	No change	No change	No change	No change	Not Significant
VEGETATION								
Reduction in vegetation abundance and diversity within the terrestrial RSA	No change	No change	No change	No change	No change	No change	No change	Not Significant
Reduction in vegetation health due to deposition of dust and metals in soil	No change	No change	No change	No change	No change	No change	No change	Not Significant
Reduction in culturally valued vegetation (blueberries)	No change	No change	No change	No change	No change	No change	No change	Not Significant
TERRESTRIAL WILDLIFE AND HABITAT								
Reduction in caribou habitat	No change	No change	No change	No change	No change	No change	No change	Not Significant
Reduction in caribou movement	No change	No change	No change	No change	No change	No change	No change	Not Significant
Caribou mortality	No change	No change	No change	No change	No change	No change	No change	Not Significant
Migratory birds	No change	No change	No change	No change	No change	No change	No change	Not Significant
FRESHWATER FISH								
Effects to Arctic char health and habitat resulting from water quality effects	No change	No change	No change	No change	No change	No change	No change	Not Significant

Table 9-1.4 Cumulative Effects Summary (Change) (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	Direction	Mitigation Measure (s)	Magnitude	Duration	Frequency	Extent	Reversibility	
SEA ICE								
Disruption of fast ice (ringed seal habitat)	No change	No change	No change	No change	No change	No change	No change	Not Significant
Changes to marine water quality at port sites due to more frequent shipping and discharge of ballast water	No change	No change	No change	No change	No change	No change	No change	Not Significant
Effects to marine biota, including Arctic char, due to potential water and sediment quality changes.	No change	No change	No change	No change	No change	No change	No change	Not Significant
RINGED SEAL								
Increased disruption of fast ice in Steensby Inlet	No change	No change	No change	No change	No change	No change	No change	Not Significant
BEARDED SEAL								
Habitat change, disturbance, and masking	No change	No change	No change	No change	No change	No change	No change	Not Significant
WALRUS								
Habitat change, disturbance, and masking	No change	No change	No change	No change	No change	No change	No change	Not Significant
NARWHAL								
Habitat change, disturbance, and masking	Negative	Apply mitigation in current Project	Level I - low (habitat change); Level II - moderate (disturbance, masking)	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA; possibly Level II - beyond the LSA and within the RSA	Level I - reversible	Not Significant

Table 9-1.4 Cumulative Effects Summary (Change) (Cont'd)

Potential Effects			Evaluation Criteria					Rated Significance of Residual Effects
Effect	**Direction**	**Mitigation Measure (s)**	**Magnitude**	**Duration**	**Frequency**	**Extent**	**Reversibility**	
BELUGA WHALE								
Habitat change, disturbance, and masking	Negative	Apply mitigation in current Project	Level I - low (habitat change); Level II - moderate (disturbance, masking)	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA; possibly Level II - beyond the LSA and within the RSA	Level I - reversible	Not Significant
BOWHEAD WHALE								
Habitat change, disturbance, and masking	Negative	Apply mitigation in current Project	Level I - low (habitat change); Level II - moderate (disturbance, masking)	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA; possibly Level II - beyond the LSA and within the RSA	Level I - reversible	Not Significant
POLAR BEAR								
Habitat change, disturbance, and possibly mortality	Negative	Apply mitigation in current Project	Level I - low	Level II - life of the Project	Level III - Frequent	Level I - confined to LSA	Level I - reversible	Not Significant

NOTE(S):
1. CACs = CRITERIA AIR CONTAMINANTS [TSP, PM10, PM2.5, SO2, NO2, CO, Fe, Mn, As, Ca, Co and POI (potential acid input).

Table 6.34: Potential Cumulative Effects on Valued Ecosystem Components

VECs	Nanisivik Naval Facility and Military Exercises	Back River Project	Raglan Mine	Meadow Bank Mine	Meliadine Project	Hope Bay Project	Mary River Approved Project (up to 2022)	Regional Ship Traffic	Regional Air Transport	Communities; Traditional/Recreational Land	Regional Monitoring Programs	Sirmilik National Park	Baffinland Regional Explorations	Climate Change	Tullurutiup Imanga/ Lancaster Sound NMCA	Cumulative Effects Assessment Summary
Climate Change	X	X	X	X	X	X	X	X	X	X	X		X			The SOP will result in incremental emissions of GHGs associated with road transportation and shipping. However, residual effects on Climate Change are predicted to be negligible and consistent with what has been assessed previously. With the exception of protected areas (e.g., Sirmilik National Park and the Tullurutiup Imanga/Lancaster Sound NMCA), all other past, existing and reasonably foreseeable projects and activities are also expected to generate GHG emissions and will contribute to climate change, although none of these on their own, or in combination with the SOP are expected to result in measurable cumulative effects on Climate Change. Baffinland remains committed to improving energy efficiency and greenhouse gas emissions performance, and working with Nunavummiut to monitor and adapt to climate change. Cumulative effects on Climate Change are predicted to be not significant.
Air Quality	X						X	X	X		X		X			The SOP will result in incremental, localized emissions of dust and other air contaminants due to road transportation and shipping. However, ongoing improvements to mitigation measures to control these emissions will reduce cumulative effect contributions from the SOP as well as the Approved Project. With the exception of protected areas (e.g., Sirmilik National Park and the pending Tullurutiup Imanga/Lancaster Sound NMCA), all other past, existing and reasonably foreseeable projects and activities are also expected to generate dust and/or other air emissions, although given the relative location of these other projects and activities and environmental management measures implemented, cumulative effects on Air Quality are predicted to be not significant.
Noise and Vibrations							X		X		X		X			The SOP will result in incremental noise emissions associated with road transportation which could interact cumulatively with noise emissions from the Approved Project and ongoing regional exploration. However, cumulative effects on Noise and Vibrations are predicted to be not significant.

VECs	Nanisivik Naval Facility and Military Exercises	Back River Project	Raglan Mine	Meadow Bank Mine	Meliadine Project	Hope Bay Project	Mary River Approved Project (up to 2022)	Regional Ship Traffic	Regional Air Transport	Communities; Traditional/Recreational Land	Regional Monitoring Programs	Sirmilik National Park	Baffinland Regional Explorations	Climate Change	Tullurutiup Imanga/ Lancaster Sound NMCA	Cumulative Effects Assessment Summary
Vegetation							X						X	X		Although no new direct habitat loss is predicted, the SOP, primarily through dust deposition along the Tote Road, may contribute to changes in vegetation abundance and distribution resulting from the Approved Project, however, new mitigations to control dust will aim to maintain or reduce the levels of dust present in the current operation. Ongoing regional exploration may also affect vegetation abundance and distribution resulting in future cumulative effects. Climate change is expected to alter the species composition of vegetation with an expansion of shrub and graminoid coverage, and this effect will overlap with changes in vegetation diversity that will occur via the loss of vegetation from ground disturbance activities and effects to vegetation health that result from dust and other air emissions. Despite uncertainty associated with the realized emissions pathways over the lifetime of other projects and activities, including the Approved Project, and the accuracy of climate models to predict responses within the Arctic, cumulative effects on Vegetation are predicted to be not significant. .
Birds and Bird Habitat	X	X				X	X	X	X	X	X		X	X		Although the SOP will not result in any new habitat loss, other projects and activities (including the Approved Project) may contribute to direct and indirect habitat loss. Shipping and road transportation of iron ore will result in noise disturbance to migratory birds along the Northern Transportation Route. Direct mortality of a few individual birds because of collisions with Project vehicles is also expected to occur as a result of the SOP. However, in-project cumulative bird mortalities are expected to remain as a few individuals and not measurable at the population level. Although the potential effects of climate change on bird habitats is difficult to quantify, the likelihood of climate change affecting migratory birds and their habitat as a result of sustained operating levels is very low and not expected to change the effects determination. Cumulative effects on Birds and Bird Habitat are predicted to be not significant.

VECs	Nanisivik Naval Facility and Military Exercises	Back River Project	Raglan Mine	Meadow Bank Mine	Meliadine Project	Hope Bay Project	Mary River Approved Project (up to 2022)	Regional Ship Traffic	Regional Air Transport	Communities; Traditional/Recreational Land	Regional Monitoring Programs	Sirmilik National Park	Baffinland Regional Explorations	Climate Change	Tullurutiup Imanga/ Lancaster Sound NMCA	Cumulative Effects Assessment Summary
Terrestrial Wildlife and Habitat	X						X		X	X	X	X	X	X		Shipping and road transportation of iron ore will result in noise disturbance to terrestrial wildlife along transportation corridor for the SOP and direct mortality of individual animals may also occur as a result of collisions with Project vehicle. Dust deposition, particularly along the Tote Road, is also expected to result in localized changes in vegetation abundance and distribution. However, project monitoring to date (which has involved ore transportation of 6 Mtpa) has not identified any significant risk to ecological health. Similarly to what has been observed to date for the Approved Project and predicted for the SOP, most of the activities are minor contributors to habitat loss and/or sensory disturbance to terrestrial wildlife within the RSA or the range of North Baffin caribou. The exceptions include the harvesting of wildlife by communities, which though important to community food security and cultural well-being, results in mortalities that may have the potential to affect caribou at the population level. Mitigation and monitoring commitments that Baffinland has made for the Approved Project will extend for the SOP, as well as new mitigations introduced in 2022 and through this Proposal, including a highly sensitive and responsive form of adaptive management (refer to Section 6.3.4.4) This will reduce cumulative effects on terrestrial wildlife and habitat. Climate change may have a disruptive effect for many wildlife species on northern Baffin Island. Effects on wildlife species population parameters such as survival, fecundity, abundance and distribution are likely, but difficult to predict. Changes in environmental processes as a result of climate change will occur independently of the SOP. Therefore, potential interactions of climate change with the Project and their effects on wildlife are limited and likely not measurable within the life of the Project. In recognition of the scope of the SOP and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on Terrestrial Wildlife and Habitat are predicted to be not significant.

VECs	Nanisivik Naval Facility and Military Exercises	Back River Project	Raglan Mine	Meadow Bank Mine	Meliadine Project	Hope Bay Project	Mary River Approved Project (up to 2022)	Regional Ship Traffic	Regional Air Transport	Communities; Traditional/Recreational Land	Regional Monitoring Programs	Sirmilik National Park	Baffinland Regional Explorations	Climate Change	Tallurutiup Imanga/ Lancaster Sound NMCA	Cumulative Effects Assessment Summary
Freshwater Quantity and Quality							X						X	X		Other than activities associated with the Mary River Project, there are no other developments or activities occurring or expected to occur within the catchments affected by the SOP. Mitigation and monitoring commitments that Baffinland has made for the Approved Project, will extend for the SOP and Phase 2 Proposal (if applicable) (refer to Section 6.3.5 and Appendix 7) and will reduce cumulative effects on terrestrial wildlife and habitat. Cumulative effects on Freshwater Quantity and Quality are predicted to be not significant.
Freshwater Biota and Habitat							X						X	X		See above. Cumulative effects on Freshwater Biota and Habitat are predicted to be not significant.
Marine Ice, Water, and Sediment Quality	X						X	X		X				X	X	The SOP will occur within the same shipping season used in relation to the Approved Project. Other shipping in the area and/or potential restrictions in the Tallurutiup Imanga National Marine Conservation Area will influence shipping through ice. Ballast water releases will remain unchanged from the Approved Project. There are therefore no changes in in cumulative effects predicted to occur for Marine Ice, Water and Sediment Quality as a result of the SOP.
Marine Habitat and Biota																The SOP is not predicted to have negligible effects on marine habitat and biota. There are therefore no cumulative effects predicted to occur for Marine Habitat and Biota as a result of the SOP.

VECs	Nanisivik Naval Facility and Military Exercises	Back River Project	Raglan Mine	Meadow Bank Mine	Meliadine Project	Hope Bay Project	Mary River Approved Project (up to 2022)	Regional Ship Traffic	Regional Air Transport	Communities; Traditional/Recreational Land	Regional Monitoring Programs	Sirmilik National Park	Baffinland Regional Explorations	Climate Change	Tullurutiup Imanga/ Lancaster Sound NMCA	Cumulative Effects Assessment Summary
Marine Mammals	X	X				X	X	X	X	X	X	X		X	X	Shipping associated with the SOP, similar to all other projects and activities involving shipping, has the potential to interact with marine mammal populations through acoustic disturbances, and vessel strikes. Marine mammal monitoring for the Approved Project (which has only included shipping from Milne Port thus far) suggests temporary and localized avoidance behaviour of marine mammals due to shipping. Narwhal abundance and distribution near Milne Port has not significantly changed and no known vessel strikes have been reported. Nonetheless, cumulative effects on marine mammals, notably narwhal, remains an important issue of concern raised by North Baffin communities. In the future, once shipping also begins from Steensby Port (as part of the Approved Project), there will be an increased potential for acoustic disturbances and vessel strikes on marine mammals. However, there is no overlap between shipping impacts on the Northern Shipping Route and those on the Southern Shipping Route for marine mammals. If shipping operations were to occur in both project areas at the same time, shipping impacts in each respective area would be impacting different populations of marine mammals. The only exception to this is with bowhead whale. Bowhead whales occurring in the Northern and Southern RSAs belong to the same population (Eastern Canada / West Greenland population). This population winters in Hudson Strait and Davis Strait, and spend their summers all around Baffin Island and in Hudson Bay. Satellite tag data indicates that some individuals have in the past circumnavigated Baffin Island during a single summer. However, this would be considered rare, and it should be noted that in this case, individual animals will not be in the same areas at once, so any Project shipping effect on these animals would be consecutive, rather than simultaneous. There are no bowhead summering grounds in the northern RSA, it is considered a migratory route during the early shoulder season for several weeks, and the number of bowhead that pass through this area is relatively low. Noise from regional air transport may also contribute to acoustic disturbance of marine mammals and harvesting of marine mammals by communities, which though important to community food security and cultural well-being, results in mortalities. Effects of climate change on the marine environment may affect marine mammal populations, although the nature and extent of these effects is uncertain. Mitigation and monitoring commitments associated with the Approved Project (refer to Section 6.5.4 and Appendix 7), including new shipping mitigation outlined in the 2022 Narwhal Adaptive Management Plan, will be implemented for the SOP and will reduce the likelihood and severity of cumulative effects on marine mammals. Cumulative effects on Marine Mammals are predicted to be not significant.

Table 6.35: Potential Cumulative Effects on Valued Socio-economic Components

VSECs	Mary River Approved Project	Nanisivik Naval Facility and Military Exercises	Back River	Raglan Mine	Meadow Bank Mine	Meliadine Project	Hope Bay Project	Regional Ship Traffic	Regional Air Transport	Communities; Traditional/Recreational Land	Regional Monitoring Programs	Sirmilik National Park	Bylot Island Migratory Bird Sanctuary	Baffinland Regional Explorations	Climate Change	Tullurutiup Imanga/ Lancaster Sound NMCA	Mary River Phase 2 Proposal	Cumulative Effects Assessment Summary
Human Health and Well-being	X			X	X	X								X			X	The SOP is predicted to result in positive and adverse residual effects on Human Health and Well-Being. Positive effects are not carried forward in the CEA. Adverse effects predicted for the Approved Project including changes in parenting, transport of substances though Project sites, and absence from the community during work rotation, are predicted to continue for the SOP and will result in cumulative effects with the Approved Project and Baffinland's regional exploration activity. Mitigation and monitoring commitments associated with the Approved Project (Section 6.6.4 and Appendix 7) will be implemented for the SOP and will serve to enhance positive cumulative effects and reduce adverse cumulative effects. Cumulative effects on Human Health and Well-Being are predicted to be not significant.

VSECs	Mary River Approved Project	Nanisivik Naval Facility and Military Exercises	Back River	Raglan Mine	Meadow Bank Mine	Meliadine Project	Hope Bay Project	Regional Ship Traffic	Regional Air Transport	Communities; Traditional/Recreational Land	Regional Monitoring Programs	Sirmilik National Park	Bylot Island Migratory Bird Sanctuary	Baffinland Regional Explorations	Climate Change	Tullurutiup Imanga/ Lancaster Sound NMCA	Mary River Phase 2 Proposal	Cumulative Effects Assessment Summary
Culture, Resources and Land Use	X	X		X	X	X	X	X		X			X	X	X		X	The SOP is predicted to have no residual effect on archaeology (no new ground disturbance) but residual effects may occur on other key indicators associated with this VSEC. Cumulative effects with other projects and activities (as well as climate change) on air quality, noise and vibration, vegetation, birds and bird habitat, terrestrial wildlife and habitat, freshwater quantity and quality, freshwater biota and habitat and marine mammals, can negatively affect Inuit Culture, Land and Resource Use, including travel and use of the land, harvesting practices, public safety, and food security. Baffinland's monitoring data of recorded land-use at the Project site suggests Inuit land use and harvesting coexists with the Project to some degree, in general. Through the IIBA, Baffinland provides compensation for Inuit hunters and harvesters impacted by the Mary River Project through the Wildlife Compensation Fund, which is administered by the QIA. Ore dust from the Approved Project (and by extension, the SOP) is not predicted to result in levels of metals in the local study area that would be harmful to the health of animals or people harvesting in the area. A number of commitments were made related to country foods, including the development of dustfall thresholds and triggers with Inuit participation within the Air Quality monitoring framework, and monitoring of certain chemicals in country foods if metals are found to be increasing in the environment, as well as the development of an Inuit-focused risk communication strategy are other important commitments made by Baffinland related to country foods. Mitigation and monitoring commitments associated with the Approved Project (Section 6.6.4 and Appendix 7) will be implemented for the SOP and will serve to reduce adverse cumulative effects on Culture, Resources and Land Use. No additional mitigation is proposed to address cumulative effects on this VSEC. Cumulative effects on Culture, Resources and Land Use are predicted to be not significant.

Table 17.3: Summary of Cumulative Effects

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Atmospheric Environment																			
Climate Change																			
Air Quality							X												SOP2 will result in incremental, localized emissions of dust and other air contaminants due to road transportation and shipping. However, ongoing improvements to mitigation measures to control these emissions will reduce cumulative effect contributions from SOP2 as well as the Approved Project. The regional mineral exploration programs are minor sources of air emissions and will not result in measurable air quality cumulative effects. Other current and future projects and activities are also expected to release dust and/or other air emissions (including through marine shipping), although given the relative timing and/or location of most of these other projects and activities (limited spatial or temporal overlap of effects) and environmental management measures implemented, cumulative effects on Air Quality are predicted to be not significant.
Noise and Vibration							X												SOP2 will result in incremental noise emissions associated with road transportation which could interact cumulatively with noise emissions from the Approved Project and ongoing regional exploration. However, these effects will remain at a low magnitude and be limited to the Noise and Vibration LSA even when construction and operation of the Steensby Rail and Steensby Port temporally overlap with transportation of iron ore along Tote Road. Other current and future projects and activities will generate noise and vibration emissions, although given the relative distance of these activities to the Mary River Project and anticipated limited spatial overlap of emissions, cumulative effects of the Mary River Project (SOP2 and Approved Project) with other projects and activities are predicted to be not significant.
Terrestrial Environment																			
Ground/ Permafrost Stability														X					With proper siting and design of Mary River Project facilities to avoid soil structure alteration, destabilization or erosion and prevent thaw weakening and settlement, no residual effects from SOP2 or Approved Project are predicted to occur. It is assumed that other projects and activities occurring in the Terrestrial RSA are also designed to be structurally sound, suitable for site conditions and avoid adverse effects on landforms and ground/permafrost stability and therefore will not contribute to cumulative adverse effects on this VC. However, climate change will continue to act as a stressor and affect ground/permafrost stability. Current and future projects and activities will therefore need to take effects of climate change into account during project design to avoid future cumulative effects on this VC.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Snow Quality	X						X	X			X	X	X	X	X			X	Dust deposition on snow along the Tote Road and in the Milne Port area may contribute to changes in Snow Quality. However, recent additional mitigations implemented by Baffinland are resulting in reduced dust deposition from the Mary River Project, thereby reducing contributions to adverse cumulative effects on Snow Quality.These mitigations will continue, as applicable, with the construction and operation of the previously approved Steensby Component and for ongoing and future mineral exploration and development by Baffinland. Cumulative effects on Snow Quality are expected to be not significant.
Vegetation Quality	**X**						**X**	**X**			**X**	**X**	**X**	**X**	**X**			**X**	Although no new direct habitat loss is predicted as a result of the SOP2, dust deposition along the Tote Road on vegetation, may contribute to adverse changes in Vegetation Quality. However, recent additional mitigations implemented by Baffinland are resulting in reduced dust deposition from the Mary River Project, thereby reducing contributions to adverse cumulative effects on Segetation Quality. These mitigations will continue, as applicable, with the construction and operation of the previously approved Steensby Component and for ongoing and future mineral exploration and development by Baffinland. Climate change is expected to alter the species composition of vegetation with an expansion of shrub and graminoid coverage, and this effect will overlap with changes in vegetation diversity that will occur via the loss of vegetation from ground disturbance activities and effects on vegetation health that result from dust and other air emissions. Climate change will also continue to affect plant successional patterns. Despite uncertainty associated with the realized emissions pathways over the lifetime of other projects and activities, including the Approved Project, and the accuracy of climate models to predict responses within the Arctic, cumulative effects on Vegetation Quality are expected to be not significant.
Birds and Bird Habitat	X						X	X	X			X	X	X	X			X	Although SOP2 will not result in any new habitat loss, other projects and activities (including the Approved Project) may contribute to direct and indirect habitat loss within the Terrestrial RSA. Shipping and transportation of iron ore (Tote Road and/or Steensby Railway) will result in noise disturbance to migratory birds. Direct mortality of a few individual birds because of collisions with Project vehicles/vessels is also expected to occur due to the Mary River Project. However, cumulative bird mortalities for the Mary River Project (SOP2 and Approved Project) and current and future mineral exploration and development by Baffinland are expected to remain as a few individuals and not be measurable at the population level. Although the potential effects of climate change on bird habitats are difficult to quantify, the likelihood of climate change affecting migratory birds and their habitat due to sustained operating levels is very low and not expected to change the determination of the effects. Cumulative effects on Birds and Bird Habitat are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Terrestrial Wildlife and Wildlife Habitat	X						X	X			X	X	X	X	X			X	Road and, eventually, rail transportation of iron ore will result in noise disturbance to terrestrial wildlife, and the direct mortality of individual animals may also occur as a result of collisions with Project vehicles. Dust deposition, particularly along the Tote Road, will continue to result in localized changes in vegetation quality (despite improved mitigations). However, project monitoring to date (which has involved ore transportation of 6 Mtpa) has not identified any significant risk to ecological health. Similarly to what has been observed for the Approved Project, most activities are minor contributors to habitat loss and/or sensory disturbance to terrestrial wildlife within the Terrestrial RSA. Community wildlife harvesting is important for food security and cultural well-being. While it results in wildlife mortality, for most species, this activity is not predicted to result in population-level changes to species. Mitigation and monitoring commitments that Baffinland has made for the Approved Project will extend for SOP2 and future mineral exploration and development, where applicable. This will reduce cumulative effects on terrestrial wildlife and habitat. Climate change may have a disruptive effect on many wildlife species on northern Baffin Island. Effects on wildlife species population parameters such as survival, fecundity, abundance and distribution are likely but difficult to predict. Changes in environmental processes as a result of climate change will occur independently of the Mary River Project. Therefore, potential interactions of climate change with the Project and their effects on wildlife are limited and likely not measurable within the life of the Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on Terrestrial Wildlife and Habitat are predicted to be not significant.
Freshwater Environment																			
Freshwater Quantity and Quality							X							X	X			X	Other than activities associated with the Mary River Project, there are no other developments or activities occurring or expected to occur that overlap spatially with the combined SOP2 and Approved Project. With the application of appropriate mitigation, monitoring, and management commitments, residual effects from the combined SOP2 and Approved Project are not significant and are unlikely to persist beyond the temporal boundaries of the combined projects. It is assumed that future projects and activities associated with the Mary River Project will also apply appropriate mitigation, monitoring, and management measures and therefore will not significantly contribute to cumulative effects. While freshwater quantity and quality are vulnerable to the effects of climate change, application of appropriate mitigation measures to the SOP2 and Approved Project is expected to limit their interaction with the potential effects of climate change. Based on residual effects of the combined SOP2 and Approved Project that are not significant, as well as limited spatial and temporal overlap of the combined SOP2 and Approved Project with other developments and activities, cumulative effects on Freshwater Quantity and Quality are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Freshwater Biota and Habitat							X							X	X			X	Other than activities associated with the Mary River Project, there are no other developments or activities occurring or expected to occur that overlap spatially with the combined SOP2 and Approved Project. With the application of appropriate mitigation, monitoring, and management commitments, residual effects from the combined SOP2 and Approved Project are not significant and are unlikely to persist beyond the temporal boundaries of the combined projects. It is assumed that future projects and activities associated with the Mary River Project will also apply appropriate mitigation, monitoring, and management measures and therefore will not significantly contribute to cumulative effects. While freshwater biota and habitats are vulnerable to the effects of climate change through changes to water quantity, quality, and temperature, the magnitude and temporal scale of changes are difficult to predict. Application of appropriate mitigation measures to SOP2 and Approved Project is expected to limit their interaction with the potential effects of climate change. Based on residual effects of the combined SOP2 and Approved Projects that are not significant, as well as limited spatial and temporal overlap of the combined SOP2 and Approved Projects with other developments and activities, cumulative effects on Freshwater Biota and Habitat are predicted to be not significant.
Arctic Char[4]							X							X	X			X	Other than activities associated with the Mary River Project, there are no other developments or activities occurring or expected to occur that overlap spatially with the combined SOP2 and Approved Project. With the application of appropriate mitigation, monitoring, and management commitments, residual effects from the combined SOP2 and Approved Project are not significant and are unlikely to persist beyond the temporal boundaries of the combined projects. It is assumed that future projects and activities associated with the Mary River Project will also apply appropriate mitigation, monitoring, and management measures and therefore will not significantly contribute to cumulative effects. While Arctic char are vulnerable to the effects of climate change through changes to water quantity, quality, and temperature, the magnitude and temporal scale of changes are difficult to predict. However, the magnitude of the residual effects of the combined SOP2 and Approved Project on Arctic char suggests that their interaction with the potential longer-term effects of climate change occurring over the entire species range, is not likely to be significant at the level of the LSA populations. Therefore, based on residual effects of the combined SOP2 and Approved Projects that are not significant, cumulative effects on Arctic char are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Marine Environment																			
Sea Ice			X								X			X	X	X		X	Marine shipping operations for SOP2 will occur within the same shipping season and using the same established shipping corridor as the Approved Project, including icebreaking during the fall shoulder season to support end-of-season shipping activities along the Northern Shipping Route. Other non-Project related shipping / icebreaking with potential to occur in the Northern RSA that may cumulatively interact with the SOP in terms of effects on sea ice formation during the fall shoulder season would include routine icebreaking activities conducted by icebreakers operated by the Canadian Coast Guard (CCG). No other projects are occurring or are expected to occur within the Northern RSA that would involve icebreaking activities. This includes the Nanisivik Naval Facility (Canadian Forces Naval Facility set to replace the former lead-zinc mine at Nanisivik in Navy Board Inlet, with plans to come operational in 2025), given that the Royal Canadian Navy (RCN) have agreed with the Government of Nunavut to not conduct icebreaking near the facility in order to protect community access to frozen waters and protect wildlife; therefore access to this site will be restricted to the RCN's operational season, which is typically between four and six weeks during the open-water season. SOP2 is therefore not anticipated to result in any net increase in cumulative effects on sea ice associated with shipping/icebreaking activities in the Northern RSA, relative to the Approved Project. In the Southern RSA, once Steensby Port becomes operational, iron ore will be shipped year-round from Steensby Port using chartered ore carriers travelling along the Southern Shipping Route which includes waters of Steensby Inlet, Foxe Basin and Hudson Strait extending to the Nunavut Settlement Area boundary at the entrance of the Labrador Sea. Icebreaking in the Southern RSA will be required to provide support to Project vessels (i.e., ice escort services) transiting to and from Steensby Port between November and July. Other projects occurring or expected to occur in the Southern RSA that involve icebreaking that may interact cumulatively with Steensby icebreaking (and by extension, result in cumulative effects on sea ice) are limited to the Raglan Mine Project (port facility in Deception Bay, Nunavik) and the Nunavik Nickel Project (port facility in Deception Bay, Nunavik), both of which involve icebreaking activities in Hudson Strait during the ice-covered seasons. Icebreaking undertaken in the Northern RSA as part of SOP2 will not interact cumulatively with icebreaking activities in the Southern RSA (Project and non-Project related) as these activities would occur in geographically distinct and non-overlapping areas, eliminating the potential for any cumulative effects on sea ice. Although there will be a period when Baffinland icebreaking operations will take place simultaneously in the Northern and Southern RSAs, icebreaking would be impacting different areas of sea ice. Also, as previously noted, Project-related shipping along the Northern Shipping Route will be substantially reduced once the Steensby Component is fully operational as it will only be required for transport of supplies and personnel for the remainder of the Project life.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
																			Mitigation and monitoring commitments that Baffinland has made for the Approved Project will extend for SOP2 and future mineral exploration and development, where applicable. This will reduce cumulative effects on sea ice. Climate change is anticipated to have a major disruptive effect on sea ice in both the Northern and Southern RSAs, as described in more detail in Section 10.7. The potential effects of Project-related icebreaking on sea ice are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change, which will occur independently of the Mary River Project. Therefore, SOP2 is not anticipated to result in any net increase in cumulative effects on sea ice associated with shipping/icebreaking activities in the Northern RSA, relative to the Approved Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on sea ice are predicted to be not significant.
Marine Water and Sediment Quality											X			X	X			X	For SOP2, there is no predicted net increase in the number and/or size of vessels calling to Milne Port compared to shipping operations that have been carried out at Milne Port since 2018 (previously approved under the SOP Addendum). However, there remains the continued potential for adverse effects on Marine Water and Sediment Quality at Milne Port due to the continuation of the following activities at rates above what is otherwise approved under the ERP ore volume limits: propeller wash from ship berthing, ore dust dispersion/deposition, marine discharges from stockpile containment ponds, and ship discharges of ballast water. Residual effects from these activities on Marine Water and Sediment Quality will be spatially restricted to the immediate Milne Port area. There are no other projects presently occurring or expected to occur in the Milne Port area including Milne Inlet (aside from other Baffinland current and future mineral exploration and development). Therefore, there is no spatial or temporal overlap between residual effects of SOP2 on Marine Water and Sediment Quality and those from other Projects in the region. SOP2 is therefore not anticipated to result in any net increase in cumulative effects on Marine Water and Sediment Quality associated with port and shipping operations in the Northern RSA, relative to the Approved Project. As the Steensby Component becomes operational, port operational activities at Steensby Port will result in residual effects to Marine Water and Sediment Quality, including effects from propeller wash, ore dust dispersion / deposition, marine discharges from containment ponds, and ship discharges of ballast water. Residual effects from these activities on Marine Water and Sediment Quality will be spatially restricted to the immediate Steensby Port area. There are no other projects presently occurring or expected to occur in the Steensby Port area including Steensby Inlet (aside from other Baffinland current and future mineral exploration and development). Therefore, there is no spatial or temporal overlap between residual effects of SOP2 on Marine Water and Sediment Quality and those from other projects in the region. SOP2 is therefore not anticipated to result in any net increase in cumulative effects on Marine Water and Sediment Quality associated with port and shipping operations in the Southern RSA, relative to the Approved Project.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
																			Although there will be a period when Baffinland port operations will take place simultaneously in the Northern and Southern RSAs, these activities would be impacting different marine receiving environments. Therefore, Baffinland's SOP2 port activities in the Northern RSA will not interact cumulatively with Project and non-Project activities in the Southern RSA as these activities would occur in geographically distinct and non-overlapping areas, eliminating the potential for any Project cumulative effects on Marine Water and Sediment Quality. Also, as previously noted, Project-related shipping along the Northern Shipping Route will be substantially reduced once the Steensby Component is fully operational as it will only be required for transport of supplies and personnel for the remainder of the Project life. Mitigation and monitoring s implemented for the Approved Project, including but not limited to dust control around the ore docks, will continue to be implemented for SOP2 and the Steensby Component. Cumulative effects on Marine Water and Sediment Quality are predicted to be not significant. Climate change is anticipated to have a major disruptive effect on Marine Water Quality in both the Northern and Southern RSAs, as described in more detail in Section 10.7. The potential effects of Project-related residual effects on Marine Water Quality are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change on Marine Water Quality, the latter of which will occur independently of the Mary River Project. Therefore, SOP2 is not anticipated to result in any net increase in cumulative effects on Marine Water Quality associated with port operations in the Northern RSA, relative to the Approved Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on Marine Water and Sediment Quality are predicted to be not significant.
Marine Habitat and Biota											X			X	X			X	For SOP2, there is no predicted net increase in the number and/or size of vessels calling to Milne Port compared to shipping operations that have been carried out at Milne Port since 2018 (previously approved under the SOP Addendum). However, there remains the continued potential for adverse effects on Marine Habitat and Biota at Milne Port due to the continuation of the following activities at rates above what is otherwise approved under the ERP ore volume limits: propeller wash from ship berthing, ore dust dispersion/deposition, marine discharges from stockpile containment ponds, and ship discharges of ballast water. Residual effects from these activities on Marine Habitat and Biota will be spatially restricted to the immediate Milne Port area. There are no other projects presently occurring or expected to occur in the Milne Port area including Milne Inlet (aside from other Baffinland current and future mineral exploration and development). Therefore, there is no spatial or temporal overlap between residual effects of SOP2 on Marine Habitat and Biota and those from other Projects in the region. SOP2 is therefore not anticipated to result in any net increase in cumulative effects on Marine Habitat

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
																			and Biota associated with port and shipping operations in the Northern RSA, relative to the Approved Project. As the Steensby Component becomes operational, port operational activities at Steensby Port will result in residual effects to Marine Habitat and Biota, including effects from propeller wash, ore dust dispersion / deposition, marine discharges from containment ponds, and ship discharges of ballast water. Residual effects from these activities on Marine Habitat and Biota will be spatially restricted to the immediate Steensby Port area. There are no other projects presently occurring or expected to occur in the Steensby Port area including Steensby Inlet (aside from other Baffinland current and future mineral exploration and development). Therefore, there is no spatial or temporal overlap between residual effects of SOP2 on Marine Habitat and Biota and those from other projects in the region. SOP2 is therefore not anticipated to result in any net increase in cumulative effects on Marine Habitat and Biota associated with port and shipping operations in the Southern RSA, relative to the Approved Project. Although there will be a period when Baffinland port operations will take place simultaneously in the Northern and Southern RSAs, these activities would be impacting different fish habitat areas and associated biological communities. Therefore, Baffinland's SOP2 port activities in the Northern RSA will not interact cumulatively with Project and non-Project activities in the Southern RSA as these activities would occur in geographically distinct and non-overlapping areas, eliminating the potential for any Project cumulative effects on Marine Habitat and Biota. Also, as previously noted, Project-related shipping along the Northern Shipping Route will be substantially reduced once the Steensby Component is fully operational as it will only be required for transport of supplies and personnel for the remainder of the Project life. Mitigation and monitoring implemented for the Approved Project, including but not limited to dust control around the ore docks, will continue to be implemented for SOP2 and the Steensby Component. Cumulative effects on Marine Habitat and Biota are predicted to be not significant. Climate change is anticipated to have a major disruptive effect on Marine Habitat and Biota in both the Northern and Southern RSAs, as described in more detail in Section 10.7. In summary, the potential effects of Project-related residual effects on Marine Habitat and Biota are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change, which will occur independently of the Mary River Project. Therefore, SOP2 is not anticipated to result in any net increase in cumulative effects on Marine Habitat and Biota associated with port operations in the Northern RSA, relative to the Approved Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on Marine Habitat and Biota are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Anadromous Arctic Char											X	X	X	X	X			X	For SOP2, there is no predicted net increase in the number and/or size of vessels calling to Milne Port compared to shipping operations that have been carried out at Milne Port since 2018 (previously approved under the SOP Addendum). However, there remains the continued potential for adverse effects on anadromous Arctic char at Milne Port due to the continuation of the following activities at rates above what is otherwise approved under the ERP ore volume limits: propeller wash from ship berthing, ore dust dispersion/deposition, marine discharges from stockpile containment ponds, and ship discharges of ballast water. Residual effects from these activities on anadromous Arctic char will be spatially restricted to the immediate Milne Port area. There are no other projects presently occurring or expected to occur in the Milne Port area including Milne Inlet (aside from other Baffinland current and future mineral exploration and development). Therefore, there is no spatial or temporal overlap between residual effects of SOP2 on anadromous Arctic char and those from other Projects in the region. SOP2 is therefore not anticipated to result in any net increase in cumulative effects on anadromous Arctic char associated with port and shipping operations in the Northern RSA, relative to the Approved Project. As the Steensby Component becomes operational, port operational activities at Steensby Port will result in residual effects to anadromous Arctic char, including effects from propeller wash, ore dust dispersion / deposition, marine discharges from containment ponds, and ship discharges of ballast water. Residual effects from these activities on anadromous Arctic char will be spatially restricted to the immediate Steensby Port area. There are no other projects presently occurring or expected to occur in the Steensby Port area including Steensby Inlet (aside from other Baffinland current and future mineral exploration and development). Therefore, there is no spatial or temporal overlap between residual effects of SOP2 on anadromous Arctic char and those from other projects in the region. SOP2 is therefore not anticipated to result in any net increase in cumulative effects on anadromous Arctic char associated with port and shipping operations in the Southern RSA, relative to the Approved Project. Although there will be a period when Baffinland port operations will take place simultaneously in the Northern and Southern RSAs, these activities would be impacting different Arctic char populations. Therefore, Baffinland's SOP2 port activities in the Northern RSA will not interact cumulatively with Project and non-Project activities in the Southern RSA as these activities would occur in geographically distinct and non-overlapping areas, eliminating the potential for any Project cumulative effects on anadromous Arctic char. Also, as previously noted, Project-related shipping along the Northern Shipping Route will be substantially reduced once the Steensby Component is fully operational as it will only be required for transport of supplies and personnel for the remainder of the Project life. Mitigation and monitoring implemented for the Approved Project, including but not limited to dust control around the ore docks, will continue to be implemented for SOP2 and the Steensby Component. Cumulative effects on anadromous Arctic char are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
																			Climate change is anticipated to have a major disruptive effect on anadromous Arctic char in both the Northern and Southern RSAs, as described in more detail in Section 10.7. In summary, the potential effects of Project-related residual effects on anadromous Arctic char are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change, which will occur independently of the Mary River Project. Therefore, SOP2 is not anticipated to result in any net increase in cumulative effects on anadromous Arctic char associated with port operations in the Northern RSA, relative to the Approved Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on anadromous Arctic char are predicted to be not significant.
Marine Mammals	X		X	X	X					X	X	X	X	X	X			X	For SOP2, marine shipping and icebreaking operations (fall shoulder season only) will occur within the same shipping season and will use the same established shipping corridor in the Northern RSA as the Approved Project. SOP2 will not involve a net increase in the number and/or size of vessels calling to Milne Port compared to shipping operations that have been carried out at Milne Port since 2018 (previously approved under the SOP Addendum). However, there remains the continued potential for adverse residual effects on marine mammals along the Northern Shipping Route due to behavioural disturbance from ship and icebreaking noise. Other projects that occur or are expected to occur in the Northern RSA that involve shipping that may interact cumulatively with SOP2 shipping (and by extension, result in cumulative behavioural disturbance of marine mammals) include the Nanisivik Naval Facility near Arctic Bay, Arctic tourism operators (i.e., cruise and expedition ships), and Canadian Coast Guard (CCG)-operated vessels. Of these, only icebreakers operated by the CCG would involve potential icebreaking in the RSA; with these occurrences anticipated to be infrequent and limited to the early and late shoulder season. SOP2 is therefore not anticipated to result in any net increase in cumulative behavioural disturbance effects on marine mammals associated with shipping and/or icebreaking activities in the Northern RSA, relative to the Approved Project. In the Southern RSA, once Steensby Port becomes operational, iron ore will be shipped year-round from Steensby Port using chartered ore carriers travelling along the Southern Shipping Route which includes waters of Steensby Inlet, Foxe Basin and Hudson Strait extending to the Nunavut Settlement Area boundary at the entrance of the Labrador Sea. Icebreaking in the Southern RSA will be required to provide support to Project vessels (i.e., ice escort services) transiting to and from Steensby Port between November and July. Other projects occurring or expected to occur in the Southern RSA that involve shipping that may interact cumulatively with SOP2 shipping (and by extension, result in cumulative effects on marine mammals) include the Raglan Mine Project, the Nunavik Nickel Project, the Meliadine Mine Project, the Meadowbank Mine Project, Arctic tourism operators (i.e., cruise and expedition ships), and CCG-operated vessels. Of these, icebreaking activities will take

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
																			place as part of the Raglan Mine Project, the Nunavik Nickel Project and by icebreakers operated by the CCG. Shipping and icebreaking undertaken in the Northern RSA as part of SOP2 will not interact cumulatively with shipping and icebreaking activities in the Southern RSA (Project and non-Project related) as these activities would occur in geographically distinct and non-overlapping areas, eliminating the potential for any cumulative behavioural disturbance effects on marine mammals. Although there will be a period when Baffinland shipping operations will take place simultaneously in the Northern and Southern RSAs, these would be impacting different marine mammal populations, or in the case of bowhead whale (whose population extends across both the Northern and Southern RSAs), Project vessel activities in either RSA would be impacting different bowhead individuals. Also, as previously noted, Project-related shipping along the Northern Shipping Route will be substantially reduced once the Steensby Component is fully operational as it will only be required for transport of supplies and personnel for the remainder of the Project life. Mitigation and monitoring commitments that Baffinland has made for the Approved Project will extend for SOP2 and future mineral exploration and development, where applicable. This will reduce cumulative behavioural disturbance effects on marine mammals due to shipping and icebreaking noise. Cumulative effects on marine mammals will be primarily driven by regional climate change effects as described in more detail in Section 10.7. In summary, the potential effects of Project-related icebreaking on marine mammals are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change, which will occur independently of the Mary River Project. Therefore, SOP2 is not anticipated to result in any net increase in cumulative behavioural disturbance effects on marine mammals associated with shipping / icebreaking activities in the Northern RSA, relative to the Approved Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on marine mammals are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Narwhal	X		X	X	X						X		X	X	X			X	Narwhal abundance and distribution in the marine RSA (i.e., Eclipse Sound summer stock area) has not changed significantly since the start of iron ore shipping operations based on the results of aerial surveys conducted between 2013 and 2023. Nonetheless, cumulative effects on Narwhal remain an important issue of concern raised by North Baffin communities. For the SOP2, there is no predicted net increase in the number and/or size of vessels calling to Milne Port compared to shipping operations that have been carried out at Milne Port since 2018 (previously approved under the SOP Addendum). However, there remains the continued potential for adverse residual effects on Narwhal along the Northern Shipping Route due to the continuation of shipping operations above what is otherwise approved under the ERP ore volume limits; these include potential behavioural disturbance due to shipping/icebreaking noise and potential ice entrapment events from icebreaking activities during the fall shoulder season. A description of cumulative behavioural disturbance effects on narwhal from shipping and icebreaking noise is summarized in the CEA section above for Marine Mammals. In consideration of cumulative risk of narwhal entrapment, the only other project occurring or expected to occur in the Northern RSA that involves icebreaking during the fall shoulder season that may interact cumulatively with SOP2 icebreaking (and by extension, result in an increased risk of narwhal entrapment in the RSA) is routine icebreaking conducted by CCG vessels; which will be infrequent in occurrence. Mitigation and monitoring commitments that Baffinland has made for the Approved Project will extend for the SOP2 and future mineral exploration and development (i.e., no breaking of landfast ice; termination of shipping prior to Nov 01; aerial clearance surveys to monitor for entrapment). These continued commitments will effectively eliminate and/or minimize the potential risk of narwhal entrapment due to cumulative shipping and icebreaking activities in the RSA. Other cumulative stressors for narwhal occurring within (and beyond) the marine RSA include increased harvesting pressure, interaction with commercial fisheries, and climate change effects. Of these, climate change is anticipated to be the primary driver of of cumulative effects on on Narwhal in the Project area and beyond. A detailed description of these stressors is provided in Section 10.7. In summary, the potential effects of Project-related icebreaking on Narwhal are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change, which will occur independently of the Mary River Project. Therefore, the SOP2 is not anticipated to result in any net increase in cumulative behavioural disturbance effects on Narwhal associated with shipping/icebreaking activities in the Northern RSA, relative to the Approved Project. Recognizing the scope of the SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on narwhal are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Ringed Seal	X		X	X	X						X		X	X	X			X	Ringed seal abundance and distribution in the Northern RSA has not changed significantly since the start of iron ore shipping operations based on the results of aerial surveys conducted over the last decade. Nonetheless, cumulative effects on Ringed Seal remain an important issue of concern raised by North Baffin communities. For SOP2, there is no predicted net increase in the number and/or size of vessels calling to Milne Port compared to shipping operations that have been carried out at Milne Port since 2018 (previously approved under the SOP Addendum). However, there remains the continued potential for adverse residual effects on Ringed Seal along the Northern Shipping Route due to the continuation of shipping operations above what is otherwise approved under the ERP ore volume limits; these include potential behavioural disturbance due to shipping/icebreaking noise and potential alteration of ringed seal habitat due to icebreaking activities during the fall shoulder season. A description of cumulative behavioural disturbance effects on Ringed Seal from shipping and icebreaking noise is summarized in the CEA section above for marine mammals. In consideration of cumulative effects on ringed seal habitat during the fall shoulder season, the only other project occurring or expected to occur in the Northern RSA that involves icebreaking during the fall shoulder season that may interact cumulatively with SOP2 icebreaking (and by extension, result in an increased alteration of ringed seal habitat in the RSA) is routine icebreaking conducted by CCG vessels; which will be infrequent in occurrence. Mitigation and monitoring commitments that Baffinland has made for the Approved Project will extend for SOP2 and future mineral exploration and development (i.e., no breaking of landfast ice; avoidance of critical ringed seal life cycle periods, termination of shipping prior to Nov 01; adherence to the nominal shipping route; 9 knot speed restriction in the RSA). These continued commitments will effectively eliminate and/or minimize the potential for cumulative effects to ringed seal habitat during the fall shoulder season due to cumulative shipping and icebreaking activities in the RSA. Climate change effects are anticipated to be the primary driver of cumulative effects on Ringed Seal in the Project area and beyond, as described in detail in Section 10.7. In summary, the potential effects of Project-related icebreaking on Ringed Seal are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change, which will occur independently of the Mary River Project. Therefore, SOP2 is not anticipated to result in any net increase in cumulative behavioural disturbance effects on Ringed Seal associated with shipping/icebreaking activities in the Northern RSA, relative to the Approved Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on Ringed Seal are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Walrus	X		X	X	X						X		X	X	X			X	For SOP2, there is no predicted net increase in the number and/or size of vessels calling to Milne Port compared to shipping operations that have been carried out at Milne Port since 2018 (previously approved under the SOP Addendum). However, there remains the continued potential for adverse residual effects on walrus along the Northern Shipping Route due to the continuation of shipping operations above what is otherwise approved under the ERP ore volume limits; these includes potential behavioural disturbance of walrus due to exposure to shipping/icebreaking noise. A description of cumulative behavioural disturbance effects on walrus from shipping and icebreaking noise is summarized in the CEA section above for marine mammals. Mitigation and monitoring commitments that Baffinland has made for the Approved Project will extend for SOP2 and future mineral exploration and development (i.e., no breaking of landfast ice; avoidance of walrus on ice, termination of shipping prior to Nov 01; adherence to the nominal shipping route; 9 knot speed restriction in the RSA). These continued commitments will effectively eliminate and/or minimize the potential for cumulative effects to walrus during SOP2 due to cumulative shipping and icebreaking activities in the RSA. Climate change effects are anticipated to be the primary driver of cumulative effects on walrus in the Project area and beyond, as described in detail in Section 10.7. In summary, the potential effects of Project-related icebreaking on walrus are predicted to be negligible (non-measurable within the life of the Project) relative to the effects of climate change, which will occur independently of the Mary River Project. Therefore, SOP2 is not anticipated to result in any net increase in cumulative behavioural disturbance effects on walrus associated with shipping/icebreaking activities in the Northern RSA, relative to the Approved Project. Recognizing the scope of SOP2 and ongoing mitigation and monitoring commitments to reduce adverse effects, cumulative effects on walrus are predicted to be not significant.
Human Environment																			
Population Demographics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SOP2 is not predicted to result in changes to Population Demographics, and as such, no cumulative effects are predicted.
Education and Training	X	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	SOP2 is predicted to have positive residual effects on Education and Training through the continued provision of and support for opportunities for improved education and training of LSA residents, and continued provision of incentives related to school attendance and success. Interactions are identified where there is potential for significant workforce overlap between the Mary River Project and other projects in the region., and benefits to education and training are expected for all identified projects.
Livelihood and Employment	X	-	-	-	-	-	-	-	-	-	-	X	-	-	X	X	X	X	SOP2 is predicted to have a positive residual effect on Livelihood and Employment through the continued employment of LSA residents, creation of jobs, and expanded employment and career development options. Interactions are identified where there is potential for significant workforce overlap between the Mary River Project and other projects in the region.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Contracting and Business Opportunities	X	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	SOP2 is predicted to result in positive residual effects on Contracting and Business Opportunities through the continuation of business opportunities for contractors and associated support for entrepreneurial capacity development for Inuit Firms. Interactions are identified where there is potential for significant overlap between SOP2 and other project business and contracting activities.
Economic Development and Self-Reliance	X	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	SOP2 is predicted to result in positive residual effects on Economic Development and Self-Reliance through increased opportunities for youth, improved education and training, increased wealth and well-being, and continued economic activity. Interactions are identified where there is potential for significant workforce overlap between the Mary River Project and other projects in the region.. See interactions identified for Inuit Culture, Resources, and Land Use for further insight into cumulative effects on Economic Development and Self-Reliance.
Benefits, Royalty and Taxation	X	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	SOP2 is predicted to result in positive residual effects on Benefits, Royalty, and Taxation through the continued generation of revenue and associated payments, including benefits, taxes, royalties, and other payments. Interactions are identified where there is potential overlap between areas of IIBA royalties and payments associated with SOP2 and potential for similar payments from other projects. While other projects may also contribute taxes to the GN, interactions are focused on effects specific to the Land Use RSA.
Community Infrastructure and Public Services	X	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	SOP2 is predicted to have a positive residual effect on Community Infrastructure and Public Services through continued labour force capacity development. Interactions are identified where there is potential for significant workforce overlap between the Mary River Project and other projects in the region. SOP2 is not predicted to significantly increase competition for workers with hamlet governments and other local organizations, and other activities within the scope of the CEA which could increase competition for workers are primarily located outside of LSA point of hire communities. As such, no adverse cumulative effect is predicted for this VC.
Human Health and Well-being	X	-	-	-	-	-	X	X	-	-	-	-	-	X	X	X	X	X	SOP2 is predicted to result in positive residual effects on Human Health and Well-Being through increased household income, contributing to food security and increased ability to afford housing. Adverse residual effects predicted for SOP2 include effects on community stability through absence from the community during work rotation and potential for increased substance use as a result of increased income. Mitigation and monitoring commitments associated with the Approved Project will be implemented for SOP2 and future activities and components associated with the Mary River Project (where applicable) and will serve to enhance positive cumulative effects and reduce adverse cumulative effects. Cumulative effects may occur where CEA activities utilize the same labour pool from LSA point of hire communities for their activities. Interactions are identified where there is potential for significant workforce overlap between the Mary River Project and other projects in the region.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Inuit Culture, Resources and Land Use	X	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X	SOP2 is predicted to have no residual effect on archaeology (no new ground disturbance) but residual effects may occur on other key indicators associated with this VC. Cumulative effects with other projects and activities (as well as climate change) on other VCs such as terrestrial and marine environments, can negatively affect Inuit Culture, Land and Resource Use through impacts to harvesting practices and food security. Residual effects from other projects and activities which may cumulatively interact with SOP2 are largely limited to interactions with shipping activities, and the resulting potential residual effects on marine mammals harvested, as discussed in the preceding biophysical VC sections. These interactions are predicted for the following activities: Raglan Mine, Meadowbank Mine, Meliadine Project, Back River Project, Hope Bay Project, Nanisivik Naval Facility and Training Operations, Grays Bay Road and Port Project, and various marine infrastructure and transportation activities. Other projects and activities in the Terrestrial RSA may interact with the Terrestrial VC, which may in turn, result in cumulative effects to harvesting of terrestrial wildlife. These activities include Baffinland and other regional exploration programs, various pits and quarries, regional monitoring programs, community land and resource use, present and future proposed protected areas, Mary River deposits 2 to 3, and Mary River deposits 4 to 9. As well, climate change may result in effects to VCs which connect to ability of Inuit to harvest both terrestrial and marine life. Baffinland's monitoring data of recorded land-use at the Project site suggests Inuit land use and harvesting coexists with the Project to some degree, in general. Through the IIBA, Baffinland provides compensation for Inuit hunters and harvesters impacted by the Mary River Project through the Wildlife Compensation Fund, which is administered by the QIA. Mitigation and monitoring commitments associated with the Approved Project will be implemented for SOP2 and future activities and components associated with the Mary River Project (where applicable) and will serve to reduce adverse cumulative effects on Culture, Resources and Land Use. Based on the significance conclusions of the Marine Environment and Terrestrial Environment VCs – the primary pathways for potential effects to Inuit Culture, Resources, and Land Use, cumulative effects on this VC are predicted to be not significant.

VCs	Nanisivik Naval Facility and Training Operations	Back River Project	Raglan Mine	Meadowbank Mine	Meliadine Project	Hope Bay Project	Baffinland and Other Mineral Exploration Programs	Various Pits ad Quarries	Marine Infrastructure and Transportation[1]	Regional Air Transport	Community Land and Resource Use[2]	Regional Monitoring Programs	Present and Future Proposed Protected Areas[3]	Climate Change	Mary River Deposits 2 to 3	Chidliak Diamond Mine	Grays Bay Road and Port	Mary River Deposits 4 to 9	Cumulative Effects Assessment Summary
Inuit Travel Route Safety																			
Inuit Travel Route Safety	X	-	-	-	-	-	X	-	-	-	-	-	-	X	X	-	X	X	The continuation of activities at the Mine Site, Tote Road, and Milne Port with the SOP2 is predicted to extend the duration of adverse residual effects of safety risks along Inuit travel routes intersecting with Project activities. Ongoing and potential future mineral exploration and development associated with the Mary River Project has the potential to cumulatively affect Inuit travel route safety. However, mitigation implemented for the Approved Project and SOP2 will apply to these activities. Interactions have been identified where there is potential for spatial overlap of SOP2 and CEA project activities along Inuit travel routes known to Baffinland. Additionally, climate change has the potential to decrease the safety of travelling over ice due to decreasing sea ice thickness, which may contribute to an overall adverse cumulative effect on Inuit travel route safety if perceived safety of travel around SOP2 activities results in the use of alternative travel routes relying on sea ice. However, there is no available data to suggest that Inuit may defer to risky sea ice travel as an alternative to travel around SOP2 activities. As such, cumulative effects are predicted to be not significant.
Cultural Well-being	X	-	-	-	-	-	-	-	-	-	-	X	-	X	X	-	X	X	SOP2 is predicted to result in variable, but overall positive, residual effects to Cultural Well-being through continued opportunities to practice cultural activities, use Inuktitut on-site, and participate in environmental monitoring. As well, variable effects predicted include continued potential changes to ability to practice cultural activities as a community due to rotational work schedule and working at the mine site away from family and community. Climate change may have significant adverse effects to opportunities to practicing cultural activities (on and off-site, such as hunting), as well as biophysical VCs and related activities identified under Inuit Culture, Resources, and Land Use for some community members. Interactions are identified where there is potential for significant workforce overlap between SOP2 activities and other projects and activities, while interactions with land use (which is acknowledged as connected to cultural well-being) are identified under Inuit Culture, Resources, and Land Use).
Governance and Leadership																			SOP2 is not predicted to result in any changes to residual effects on Governance and Leadership, and as such, no cumulative effects are predicted.

Notes:

[1]Includes but not limited to small craft harbour and port activity, shipping, passenger transport, and recreational vessel use.

[2]Includes development (e.g., roads and other infrastructure), and traditional and recreational land and resource use.

[3]Includes present and proposed protected areas as per the screening conducted in Table 6.7.

Attachment 2

SOP2 Other Projects and Activities with the Potential to Interact Cumulatively with the Mary River Project

Table 6.8: Other Projects and Activities with the Potential to Interact Cumulatively with the Mary River Project

Category	Project / Physical Activity	Description	Proponent / Organization	Approximate Distance from Project	Status / Timeline	Temporal Overlap	Spatial Overlap	Inclusion in Updated CEA
Past Projects or Activities that Have Been Carried Out								
Mining and Mineral Exploration	Nanisivik Mine (Decommissioned) (NIRB Registry No. 04YN100)	Former Lead-Zinc Mine decommissioned in 2003 located in the Arctic Bay with ongoing research by the University of Saskatchewan for residual soil contaminants. Shipping and icebreaking operations occurred during spring, summer and fall seasons including icebreaking through landfast ice.	Breakwater Resources Inc.	~ 180 km NW of Milne Port	Operated: 1976-2002 Decommissioned 2003-2008	No	No spatial overlap between shipping operations and the Marine RSA	No Mine decommissioning occurred outside CEA temporal boundaries; no residual effects remain in the Marine RSA to interact cumulatively with the Mary River Project
Mining and Exploration	Polaris Mine (Decommissioned) (NIRB Registry No. 01MD098; 03YN103)	Former Zinc and Lead Mine located on Little Cornwallis Island in Nunavut. Final reclamation of the site was completed in 2011.	Teck Cominco	~ 650 km NW of Milne Port	Operated: 1981-2002 Decommissioned: 2003-2004	No	No spatial overlap between shipping operations and the Marine RSA	No Mine decommissioning occurred outside CEA temporal boundaries; no residual effects remain in the Marine RSA to interact cumulatively with the Mary River Project
Mining and Exploration	Diamond Exploration	Diamond exploration programs southwest of the Mine Site	DeBeers Canada Inc.	~ 50 km SW of Mine Site	2004 to 2008	No	Spatial boundaries within terrestrial RSA	No Previously assessed in the FEIS CEA; No residual effects remain in the terrestrial RSA to interact cumulatively with the Mary River Project
Present and Ongoing Projects or Activities								
Communities	Land and Resource Use	Traditional and recreational hunting, fishing and foraging activities associated with the seven potentially affected communities	Arctic Bay, Clyde River, Sanirajak, Igloolik, Pond Inlet, Kimmirut, Kinngait	Various	Ongoing	Within CEA temporal boundaries	Within land use RSA	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Commercial Fisheries	Commercial fishing	Various inshore and inland (Arctic char, shrimp, whelks, clams) and offshore fisheries (turbot and shrimp).	Across Nunavut (incl. Qikiqtani Region)	Various	Ongoing	Within CEA temporal boundaries	Within marine RSA	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Military	Nanisivik Naval Facility (NIRB Registry No. 09DN018) and Training Operations	Royal Canadian Navy (RCN) docking and refueling facility at the former Nanisivik Zink Mine site near the community of Arctic Bay (~100 km southeast of Resolute). Facility to serve primarily as a deep-water refueling and resupply station for Arctic Offshore Patrol Ships, Canadian Coast Guard and other government ships transiting through the Northwest Passage during the navigable season. The period of operation is expected to be about 4 weeks per year. The lifespan of the facility is at least 40 years. In November 2022, the Auditor General of Canada reported that the facility would start to be used by the RCN regularly beginning in 2025. The RCN have agreed with the Government of Nunavut to not break ice near the facility in order to protect community access to frozen waters and protect wildlife, therefore access is restricted to the RCN's operational season, which is typically between four and six weeks (between August and October). As long as the waters are navigable and the facility is accessible, the Nanisivik Naval Facility will be open to RCN and CCG ships. As of 2023 filings with NIRB, the facility is currently being constructed and commissioning was proposed for 2024. Operation Nanook is the Canadian Armed Forces' signature northern operation and takes place each year across Yukon, the Northwest Territories, Nunavut, and Labrador. It features up to 4 deployments throughout the year. In 2023 Operation Nanook-Nunalivut took place from March 1 to 20, 2023 in and around the community of Rankin Inlet, Nunavut. Operational activities included long range patrols, ice diving, and an austere range. Operation Nanook-Tuugalik took place from August 8 to August 25, with portions of the operation continuing through September 29. As part of the operation, the USS San Juan, with members of the Royal Canadian Navy aboard, navigated the Northwest Passage. Canadian Armed Forces are expected to undertake Operation Nanook annually, including up to four deployments by air, land and sea (Government of Canada 2023).	Department of National Defence	~ 180 km NW of Milne Port	Construction: 2014-2023 Operations: 2024-2064	Within CEA temporal boundaries	Unknown; could support shipping that overlaps with Northern Shipping Route	Yes Effects on marine environment may interact cumulatively with the Mary River Project

Category	Project / Physical Activity	Description	Proponent / Organization	Approximate Distance from Project	Status / Timeline	Temporal Overlap	Spatial Overlap	Inclusion in Updated CEA
Military	Military Radar Stations (DEW Line Decommissioning)	DEW Line system remediation concluded in 2014. The current North Warning System (NWS) consists of unmanned stations (radar tower, building and airstrip) south of the RSA. In Canada, the NWS consists of 47 radar sites of 11 long-range and 36 short-range radar sites. These sites are operated remotely but do require periodic visits for inspection and maintenance.	Department of National Defence	Closest station is ~ 500 km SE of Mine Site	1950s onwards	Within CEA temporal boundaries	Outside of terrestrial RSA	No Zone of influence of effects does not overlap with predicted zone of influence of the Mary River Project
Mining and Mineral Exploration	Raglan Mine	Operating nickel mine in Deception Bay in the Nunavik region of Northern Quebec. The mine includes two new mining phases called the Sivumut Project (Glencore 2017). In 2022, Raglan mine produced 24,323 tonnes of nickel, 5,488 tonnes of copper, and 498 tonnes of cobalt. Nickel concentrate travels 100 kilometers by truck the mine site to the Deception Bay seaport before traveling 2,600 km by sea voyage to the Port of Québec aboard the MV Arvik, a 27,000 metric ton icebreak bulk carrier. The concentrate then travels by train to Sudbury, Ontario for smelting into matte. The product returns to Québec City by rail and is then shipped to Kristiansand, Norway where the raw nickel is processed. The Raglan Mine involves year round shipping and icebreaking during the ice-covered periods. There were 8 trips planned for the MV Arvik between June 2023 and March 2024 from Raglan Mine to the Port of Québec (Glencore n.d).	Glencore Canada Corporation	~ 1000 km SSE from Steensby Port	Operations: 1997-2041	Within CEA temporal boundaries	Shipping and icebreaking activities overlap with Southern Shipping Route/marine RSA	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Mining and Mineral Exploration	Nunavik Nickel Project	The Nunavik Nickel Project involves the construction and operation of an open-pit mine for primary nickel extraction and secondary copper extraction and the construction of port infrastructure at Deception Bay in the Nunavik region of Northern Quebec. The mine is located south of the Raglan Mine, between the communities of Salluit and Kangiqsujuaq. The production phase started in February 2013 and continues to employ upwards of 1000 workers today. Due to the remote location of the Mine site, most all Canadian supplies are shipped into the Port of Deception Bay by sealift during the ice-free summer months between July and November inclusively. During the winter months between December and March, only ships with icebreaking capabilities can reach the Port. Between March 15 and June 15 is a black-out period where no ships are permitted in the Bay. This is so that the neighboring Inuit community residents can travel freely and safely on the iced over Bay. This leaves the Nunavik Nickel Project Mine with a narrow shipping window in which to receive supplies for a year-round operation. Under normal operations, this is managed through careful procurement, inventory, and storage plans. The ore carriers that the proponent plans to use have a maximum capacity of 25,000 tonnes and are approximately 190 m long. An estimated nine trips are made each year between mid-June and mid-March. This is the shipping period that has been agreed upon with the Inuit and that is specified in the certificate of authorization issued by the Quebec Department of Sustainable Development, Environment and Parks (MDDEP) in 2008. The proponent has indicated that CRI's ships will follow the same route in Deception Bay as Glencore Xstrata's ships. With the three trips required to supply fuel and goods, CRI would make a total of 12 trips per year in Deception Bay, two of which would be in ice-covered waters.	Canadian Royalties Inc. (CRI)	~ 1000 km SSE from Steensby Port	Operations: 2013-onwards	Within CEA temporal boundaries	Shipping and icebreaking activities overlap with Southern Shipping Route/marine RSA	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project

Category	Project / Physical Activity	Description	Proponent / Organization	Approximate Distance from Project	Status / Timeline	Temporal Overlap	Spatial Overlap	Inclusion in Updated CEA
Mining and Mineral Exploration	Meadowbank Mine (NIRB Registry No. 08CN076) (including Whale Tail [NIRB Registry No. 16MN056] and Amaruq extensions [NIRB Registry No. 15EN050])	Operating gold mine 100 km from Baker Lake, Kivalliq, Nunavut (Agnico Eagle Mines Ltd. 2017). Meadowbank Complex includes processing facilities and infrastructure at the Meadowbank mine site and mining and infrastructure at the Amaruq site. Amaruq property (127,042 hectares) is located approximately 50 km northwest of the Meadowbank mine site, with a 64-kilometre road connecting the two sites. The final year of production at the Meadowbank mine was 2019. The Amaruq mining operation uses the existing infrastructure at the Meadowbank mine, including mining equipment, mill, tailings facilities, camp and airstrip. Additional infrastructure has been built at the Amaruq site, including a truck shop/warehouse, fuel storage and a second camp facility. Amaruq ore is transported using long haul off-road type trucks to the mill at the Meadowbank facilities for processing. The mining rate at Amaruq underground is set to gradually ramp-up to approximately 2,300 tpd. Over the five-year mine life, the average mining rate is expected to be approximately 2,000 tpd. The current mine life for the Amaruq mine is 2026. The process design at the Meadowbank mill consists of two-stage crushing, grinding, gravity concentration, cyanide leaching and gold recovery in a CIP circuit with a current capacity of 3.6 million tonnes processed per year (9,840 tonnes per day). At the Meadowbank Complex in 2023, 32,000 metres of expensed exploration drilling was proposed, focused on testing open-pit and depth extensions of mineralization and the potential for further underground deposits at the Amaruq satellite operation. An additional 8,000 metres of drilling is proposed to investigate for new, near-surface satellite deposits close to the road and infrastructure around the Meliadine and Meadowbank/Amaruq operations (Agnico Eagle 2024a).	Agnico Eagle Mines Ltd.	~ 1,000 km SW from the Mine Site	Operating since 2010; with Extension Proposal extending operations to 2025 and closure activities planned from 2026 to 2051 Ongoing exploration	Within CEA temporal boundaries	Shipping overlaps with Southern Shipping Route/marine RSA	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Mining and Mineral Exploration	Meliadine Project (NIRB Registry No. 11MN034)	Gold project, 25 km from Rankin Inlet. Updates proposed to allow extension of mine life to 2043. Includes seven gold deposits, six of which are part of the current mine plan. The 98,222-hectare property covers an 80-km-long greenstone belt. Operations proposed include 10 open pits and two underground mining operations. The mill employs a conventional gold circuit comprising crushing, grinding, gravity separation and cyanide leaching with a carbon-in-leach circuit, followed by cyanide destruction and filtration of the tailings for dry stacking. In 2022, milling rates averaged 4,814 tonnes per day. The Phase 2 mill expansion is expected to be completed in mid-2024 and the processing rate ramp-up is expected to increase throughput to achieve 6,000 tpd by year-end 2024. An additional 8,000 metres of drilling is proposed to investigate for new, near-surface satellite deposits close to the road and infrastructure around the Meliadine and Meadowbank/Amaruq operations (Agnico Eagle 2024b)..	Agnico Eagle Mines Ltd.	~ 1000 km SW from Steensby Port	Currently in operations, with proposed extension to 2043 Ongoing exploration	Within CEA temporal boundaries	Shipping overlaps with Southern Shipping Route/marine RSA	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Mining and Mineral Exploration	Back River Project (NIRB Registry No. 12MN036)	Gold project in the West Kitikmeot region with a 160 km winter ice road connecting the mine (Goose Property) to a marine laydown area port facility in Bathurst Inlet. Construction is underway with estimated 15 years of production starting in 2025. Recent proposed modifications include the addition of wind and solar energy facilities. Exploration at other properties is ongoing. The processing plant mill at the Goose Property uses conventional gravity concentration and cyanidation techniques at approximately 6,000 tonnes of ore per day. The gold dore bars produced at the processing plant will be stored on-site and then transported off-site by aircraft on a semi-weekly basis. The marine laydown area consists of a single barge terminal, laydown areas, a camp facility, and associated storage and maintenance facilities. The project will be resupplied annually from southern Canada by barge during the open water season. Project materials would then be transported annually from the marine laydown area to the Goose Property using the winter ice road from mid-January to April.	B2Gold Corp. (formerly Sabina Gold and Silver Corporation)	~ 1200 km WSW from the Mine Site	Construction: 2023-2025 Operations: 2025-2040 Ongoing exploration	Within CEA temporal boundaries	Limited supply shipments through Northwest Passage – does not overlap with Northern Shipping Route or marine RSA.	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project

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Mining and Mineral Exploration	Hope Bay Project (Doris North Gold Mine [NIRB Registry No. 05MN047) and the Phase 2 Hope Bay Belt Project [NIRB Registry No. 12MN001])	Gold mine in the Kitikmeot region, Nunavut. Hope Bay Project Currently in care and maintenance mode. In 2022 and 2023, production activities remained suspended; the focus at Hope Bay is on exploration.	Agnico Eagle (previously TMAC Resources Inc.)	~ 1200 km SW of the Mine Site	Doris North: 2017-2022 Hope Bay: Exploration	Within CEA temporal boundaries	Limited supply shipments may overlap with Northern Shipping Route	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Mining and Mineral Exploration	Baffinland Regional Exploration	Baffinland continues to conduct ongoing regional exploration	Baffinland Iron Mines Corporation	~ 200 km SE of Mine Site; ~90 km ESE of Steensby Port	2019 onwards	Within CEA temporal boundaries	Within terrestrial RSA	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Mining and Mineral Exploration	Various Mineral Exploration Programs	Various ongoing mineral exploration programs on Baffin Island	Various	Various	Ongoing	Within CEA temporal boundaries	May occur within the terrestrial RSA	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Monitoring and Research	Regional Monitoring Programs	Marine mammal, marine environment, caribou, bird and freshwater environmental effects monitoring programs	DFO Government of Nunavut, Baffinland	Within the Terrestrial and Marine RSAs	Ongoing	Within CEA temporal boundaries	Within terrestrial and marine RSAs	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Natural Events	Climate Change	There is documented evidence that climate change is occurring globally and in the region, and that these trends will continue into the future. See Section 4.4 and 7.1.1 for more information on climate change in the Arctic.	N/A	Global	N/A	Within CEA temporal boundaries	Within terrestrial and marine RSAs	Yes Effects overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Pits and Quarries	Various	Various present and ongoing pits and quarries in Qikiqtani operated by the Government of Nunavut and private proponents for building materials, and Inuit art (e.g., soapstone and carving stone deposits)	Various	Various	Ongoing	Within CEA temporal boundaries	Potentially within the terrestrial RSA	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Transportation	Marine Transport / Shipping	Marine transport and shipping in Hudson Strait, Foxe Basin, Baffin Bay, Eclipse Sounds	Various	~ 100 km NE of Milne Port	Ongoing	Within CEA temporal boundaries	Shipping overlaps with Northern Shipping Route	Yes Activities overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Transportation	Regional Air Traffic	Air transport servicing communities located across Nunavut. The impacts of regional air transport are expected to be confined to a relatively compact area surrounding each community or industrial project, since these aircraft generally fly at high altitudes outside of the approach to airstrips.	Various	~ 150 to 400 km from the Mine Site	Ongoing	Within CEA temporal boundaries	Potentially within terrestrial and marine RSAs	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Transportation	Small Craft Harbours	Coastal infrastructure improvements by DFO to provide safe and accessible small craft harbour facilities to allow communities to pursue marine fish and marine mammal harvesting	Fisheries and Oceans Canada	Various (incl. Clyde River, Arctic Bay Pond Inlet, Iqaluit)	Ongoing	Within CEA temporal boundaries	Potential overlap with Northern Shipping Route	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Transportation	Community Roads	Operation and maintenance (including infrastructure upgrades and network expansion of various roads in Baffin Island communities	Various	Arctic Bay, Clyde River, Sanirajak, Igloolik, Pond Inlet, Kimmirut, Kinngait	Ongoing	Within CEA temporal boundaries	Potentially within terrestrial RSA for some communities	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project

Category	Project / Physical Activity	Description	Proponent / Organization	Approximate Distance from Project	Status / Timeline	Temporal Overlap	Spatial Overlap	Inclusion in Updated CEA
Transportation/ Tourism	Tourism (Arctic cruises)	Arctic cruise voyages in the Northwest Passage for tourism, wildlife viewing and landings (using zodiac boats) at local communities. Eight cruise ships conducted 23 voyages in Nunavut in 2018 and the Government of Nunavut estimates that 12 cruise ships conducted 21 separate voyages in Nunavut waters between July and September 2019 (Government of Nunavut nd(a). The expedition cruise season did not occur in 2020 due to the COVID-19 pandemic. Transport Canada subsequently canceled the season, which runs from July to October each year, through to February 2022. In 2023, the Association of Arctic Expedition Cruise Operators confirmed its members' ships would not travel through Eclipse Sound during the summer period (remaining in waters east of Pond Inlet) in response to MHTO's request to avoid this area given the number of summering narwhal in the Eclipse Sound summer stock area was shown to decrease in recent years, which they associated with increased shipping traffic. It is expected that Arctic cruise activity to return to pre-pandemic levels and increase in the future (Government of Nunavut nd(b).	Various (incl. F.K. Warren)	Various	Ongoing	Within CEA temporal boundaries	Potential overlap with Northern Shipping Route and Southern Shipping Route	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Protected Areas	Bylot Island Migratory Bird Sanctuary	Federally designated as a Category IV Habitat Species Management Area by the International Union for the Conservation of Nature. Activities include harvesting and bird research. Located within Sirmilik National Park.	Environment and Climate Change Canada	~ 175 km N of Milne Port	Ongoing	Within CEA temporal boundaries	Within marine RSA	No Overlaps with the Project temporally and spatially but is not predicted to have any adverse residual effects and therefore is excluded from the CEA
Protected Areas	Sirmilik National Park	Tourist visits to experience the ecology and remoteness of the area, backcountry camping, ski touring, wildlife viewing and boating (May-September).	Parks Canada	~ 175 km N of Milne Port	Ongoing	Within CEA temporal boundaries	Within marine RSA; the National Park is located north of Milne Port and overlaps with the RSA boundaries and shipping routes	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Protected Areas	Tuvaijuittuq Marine Protected Area (MPA)	MPA off the northwest coast of Ellesmere Island in the Arctic Ocean designated in August 2019 by Ministerial Order for interim protection until longer term protection for this area is established. Under the order no new or additional human activities are allowed for up to five years with the exception of the exercise of Inuit rights respecting wildlife harvesting; scientific research consistent with conservation objectives of the MPA; safety, security and emergency activities; and certain activities carried out by a foreign national, entity, ship or state	Government of Canada, Government of Nunavut, and QIA	Off the northwest coast of Ellesmere Island; >1,000 km from the Northern Shipping Corridor	Ongoing	Within CEA temporal boundaries	No	No The protected area would not result in adverse residual effects that could overlap and interact cumulatively with the Mary River Project
Certain and Reasonably Foreseeable Future Projects and Activities								
Mining and Mineral Exploration	Mary River Deposits 2 to 3	Baffinland plans to expand the Mary River Project to include iron ore Deposits 2 and 3. Baffinland has expanded current monitoring programs to collect baseline conditions data for these areas and plans to start the permitting process in the next 2-3 years. Deposits No. 2 and 3 are located within the Mary River watershed upstream of Deposit No. 1. Limited additional infrastructure would be required if these deposits were mined subsequent to mining Deposit No. 1, beyond a new haul road and/or conveyor to move ore from these deposits to the crusher and stockpiling area within the current Mine Site. The Mine Site PDA would expand to incorporate the footprint of the open pits and the associated waste rock stockpiles. These deposits could also be mined concurrent with Deposit No. 1 under an increased production rate scenario with modest additional infrastructure. Existing material handling and transportation infrastructure would need to be upsized to account for handling a larger quantity of ore. This would potentially include upsizing crushers, conveyors, stockpile areas, and increasing the number of rail cars transporting ore to one or both ports. Additional vessel traffic would be needed to ship the increased volume of ore to market. Refer to Section 2.4 for more information on Baffinland's long term development plan including Deposits 2 and 3.	Baffinland	Immediately adjacent to the Mine Site	2030-2060	Within CEA temporal boundaries	Within terrestrial RSA	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project

Category	Project / Physical Activity	Description	Proponent / Organization	Approximate Distance from Project	Status / Timeline	Temporal Overlap	Spatial Overlap	Inclusion in Updated CEA
Mining and Mineral Exploration	Chidliak Diamond Mine (NIRB Registry No. 22MN025)	Diamond mine at the Chidliak exploration site on the Hall Peninsula of Baffin Island, NU. De Beers is planning for a series of relatively small cylindrical pits or underground mines, likely mined in sequence. Each cluster would have an adjacent rock pile and processed kimberlite area with supporting infrastructure. The process plant is envisioned to be a mobile, modular facility which could be relocated to each cluster of kimberlites as required. The camp is anticipated to be small and modular, housing only those personnel that must be on site to perform their roles. Additional support personnel will be located off-site and may operate equipment remotely. De Beers is investigating low-carbon energy systems for use at the site, including synthetic diesel, micro-reactors, hydro-electricity, wind, and solar.	De Beers Canada Inc.	>700 km from Steensby Port; on Hall Peninsula (Southern Baffin Island)	2028-2051	Within CEA temporal boundaries	Within Land Use RSA (Iqaluit)	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project
Protected Areas	Tallurutiup Imanga National Marine Conservation Area (NMCA)	Proposed National Marine Conservation Area, final boundary was agreed upon in August 2017, IIBA negotiations included federal programs, investment in infrastructure, harbours, and a training centre in support of five communities (Arctic Bay, Clyde River, Grise Fiord, Pond Inlet, and Resolute Bay). Tallurutiup Imanga is internationally recognized for its natural and cultural value providing essential habitat for narwhal, beluga, polar bears and several seabird species and traditional Inuit resource use. An interim management plan is currently being prepared for the proposed NMCA.	Government of Canada, Government of Nunavut, and QIA	~ 270 km N of Milne Port	Proposed future	Expected to be within CEA temporal boundaries	Within marine RSA	Yes Overlaps with the Project temporally and spatially and potential restrictions on activities represent a change in the environment which could potentially interact cumulative with the Mary River Project
Protected Areas	North Water Polynya (Pikialasorsuaq)	Remains ice-free in winter and provides important habitat for Arctic and migratory species. Plankton explosion in early spring provides food for numerous species. Pikialasorsuaq Commission recommended identifying a protected area that includes the polynya and a larger management zone with Inuit-led management.	Pikialasorsuaq Commission	North of Baffin Bay and Northern Shipping Route	Proposed future	Within CEA temporal boundaries	No	No The proposed protected area would not result in adverse residual effects that could overlap and interact cumulatively with the Mary River Project
Protected Areas	Southampton Island Area of Interest	AOI (candidate Marine Protected Area) under the *Oceans Act* within the Hudson Bay Complex Marine Bioregion. Represents important migration pathway for marine mammals (narwhal, beluga whales and bowhead whales), contains walrus haul-out sites, polar bear dens, and habitat for numerous seabird colonies.	DFO	Adjacent to Southern Shipping Route; near confluence of Hudson Bay and Fox Basin waters	Proposed future	Within CEA temporal boundaries	Yes	No The proposed protected area would not result in adverse residual effects that could overlap and interact cumulatively with the Mary River Project
Protected Areas	Qikiqtait Protected Area Development (Belcher Islands Archipelago)	Inuit-led research and conservation project supporting the future protection of the Belcher Islands Archipelago	Hamlet of Sanikiluaq, Sanikiluaq Hunters and Trappers Association, Arctic Eider Society, QIA	In Hudson Bay; >1,000 km from Southern Shipping Route	Ongoing research with future objective of establishing a protected area	Within CEA temporal boundaries	No	No The proposed protected area would not result in adverse residual effects that could overlap and interact cumulatively with the Mary River Project
Transportation (Infrastructure)	Grays Bay Road and Port Project (GBRP) (NIRB Registry No. 17XN011)	Proposed 230 km all-season road linking the northern terminus of the Tibbitt- Contwoyto Winter Road to a deep-water port at Grays Bay. Intended to improve regional resupply and induce mining in the Slave Geological Province. Project assessment under previous proponent was terminated in March 2023. New proponent signed novation and assignment agreement with landowner and shareholder (previous proponent) in November 2023. A port for cargo ships to dock, a small craft harbour, and supporting infrastructure at Grays Bay are proposed.	West Kitikmeot Gold Corp. (formerly Kitikmeot Inuit Association)	~ 1,200 km from Milne Port	Planned proposal submission to NIRB in 2024	Within CEA temporal boundaries	Does not overlap with Marine RSA or Terrestrial RSA but within NSA	Yes Activities may overlap with the Project temporally and some effects may interact cumulatively with the Mary River Project
Potential Future Development								
Mining and Mineral Exploration	Mary River Deposits 4 to 9	Baffinland may potentially develop deposits 4 to 9 in the future which could potentially extend the life of the Mary River Project. Unlike potential future development of Deposits 2 and 3, these deposits are further removed from existing facilities and would likely require dedicated ore stockpiling, crushing and loading facilities as well as separate camps. Development of these future deposits could extend the useful life of infrastructure constructed for Deposit No. 1. Upsizing of material handling facilities would also be required for transport (e.g., more rail cars) and at Steensby Port.	Baffinland	Less than 30 km from the Mine Site	Potential future induced project	Within CEA temporal boundaries	Within terrestrial RSA	Yes Activities may overlap with the Project temporally and spatially and effects may interact cumulatively with the Mary River Project