NIRB Nunavut Impact Review Board
NUNAVUMI AVATILIKIYIN KATIMAYIN

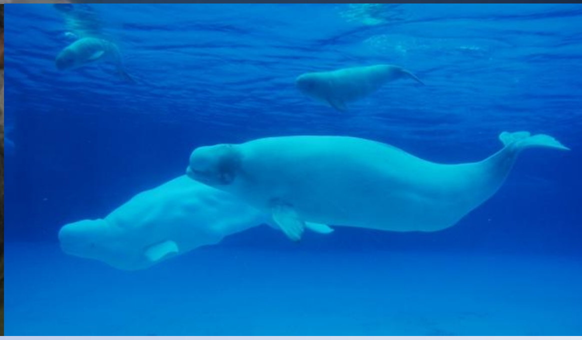
Nunavut Impact Review Board

Final Hearing Report

Mary River Project

Baffinland Iron Mines Corporation

NIRB File No. 08MN053



SEPTEMBER

2012

INSIDE COVER PAGE

The Nunavut Impact Review Board's Primary Objectives under the Nunavut Land Claims Agreement, Article 12, Section 2.2.5:

In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall take into account the well-being of residents of Canada outside the Nunavut Settlement Area.

Contact Information:
Nunavut Impact Review Board
PO Box 1360
29 Mitik Street
Cambridge Bay, NU X0B 0C0
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Cover Photo Credits:
Flowers and Sea—Courtesy of NIRB Staff
Mary River Project Site Aerial View— Courtesy of NIRB Staff
Ship—Courtesy of Baffinland Iron Mines Corp. (Photo from: "*Shipping and the Marine Environment*" Final Hearing presentation, slide 1)
Collaborative Mapping Session—Courtesy of Baffinland Iron Mines Corp. (Photo from: "*Final Hearing Nunavut Impact Review Board, Introductory Presentation*", Slide 9)
Beluga Whale, San Diego Aquarium— Courtesy of NIRB Staff

SIGNATURE PAGE

Photo 1: Board Members (from left) Henry Ohokannoak, Phillip Kadlun, Kaviq Kalluraq, Elizabeth Copland, Allen Maghagak, Guy Alikut

THIS REPORT IS SUBMITTED TO THE HONOURABLE JOHN DUNCAN, MINISTER OF ABORIGINAL AFFAIRS AND NORTHERN DEVELOPMENT AND FEDERAL INTERLOCUTOR FOR METIS AND NON-STATUS INDIANS BY THE NUNAVUT IMPACT REVIEW BOARD ON THIS 14TH DAY OF SEPTEMBER, 2012.

Elizabeth Copland
Acting Chairperson

Phillip Kadlun
Vice-Chairperson

Marjorie Kaviq Kaluraq
Secretary-Treasurer

Henry Ohokannoak
Board Member

Guy Alikut
Board Member

Allen Maghagak
Board Member

COVER LETTER

NIRB File No.: 08MN053

September 14, 2012

The Honourable John Duncan
Minister of Aboriginal Affairs and Northern Development Canada
Federal Interlocutor for Métis and Non-Status Indians
10 Wellington, 21st Floor
Gatineau, QC K1A 0H4

Sent via email and courier: duncan.j@parl.gc.ca; minister@aandc.gc.ca

Re: Final Hearing Report for Baffinland Iron Mine Corp.'s Mary River Project Proposal

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Dear John Duncan:

As required under Section 12.5.6 of the *Nunavut Land Claims Agreement* (NLCA) please find enclosed the Final Hearing Report of the Nunavut Impact Review Board (NIRB) with respect to Baffinland Iron Mines Corporation's "Mary River" Project Proposal, NIRB File No.: 08MN053. The enclosed Final Hearing Report contains the NIRB's assessment of the potential ecosystemic and socio-economic effects of the Mary River Project Proposal and concludes that the Project should proceed. In the Final Hearing Report, the NIRB has provided recommended Terms and Conditions for the Project consistent with the objectives set out in Section 12.2.5 of the NLCA.

This Final Hearing Report and recommended Terms and Conditions are provided to you for your consideration and decision as set out in Section 12.5.7 of the NLCA.

Translated versions of the Final Hearing Report are being prepared in Inuktitut and French, and will be available as soon as possible. Please contact the undersigned in writing if you have questions regarding this matter.

Sincerely,

Elizabeth Copland
Acting Chairperson
Nunavut Impact Review Board

cc: The Honourable Keith Ashfield, Minister of Fisheries and Oceans, GOC
The Honourable Peter Kent, Minister of Environment, GOC
The Honourable Denis Lebel, Minister of Transport, Infrastructure and Communities, GOC
The Honourable Joe Oliver, Minister of Natural Resources, GOC
Cathy Towtongie, President, Nunavut Tunngavik Incorporated
Okalik Eegeesiak, President, Qikiqtani Inuit Association
Mr. Tom Paddon, President and CEO, Baffinland Iron Mines Corporation
Mr. Erik Madsen, Vice President Sustainable Development, Baffinland Iron Mines Corporation
Mr. Oliver Curran, Director Sustainable Development, Baffinland Iron Mines Corporation
Parties and Intervenors

RECORD OF PROCEEDINGS

Project Proponent:	Baffinland Iron Mines Corporation Suite 1016, 120 Adelaide Street West Toronto, ON M5H 1T1 Telephone: (416) 364-8820 Fax: (416) 364-0193 Website: www.baffinland.com
Date Project Description Received:	March 20, 2008
Positive Conformity Determination Received from NPC:	April 30, 2008
Dates of Hearings	Day 1: July 16, 2012, Iqaluit, NU Day 2: July 17, 2012, Iqaluit, NU Day 3: July 18, 2012, Iqaluit, NU Day 4: July 19, 2012, Iqaluit, NU Day 5: July 20, 2012, Iqaluit, NU Day 6: July 23, 2012, Igloolik, NU Day 7: July 24, 2012, Igloolik, NU Day 8: July 25, 2012, Igloolik, NU Day 9: July 26, 2012, Pond Inlet, NU Day 10: July 27, 2012, Pond Inlet, NU Day 11: July 28, 2012, Pond Inlet, NU
Board Members Present:	Elizabeth Copland, Acting Chairperson Guy Alikut Phillip Kadlun Kaviq (Marjorie) Kaluraq Henry Ohokannoak Allen Maghagak

Board Staff:	Executive Director	R. Barry
	Director of Technical Services	A. Hanson
	Technical Advisor	L. Wan
	Technical Advisor (Nunavut Water Board)	S. Joseph
	Technical Advisor	S. Granchinho
	Assistant Technical Advisor	T. Bolt
	Senior Finance Officer	P. Evalik
	Director of Finance	M. Ings
Board Legal Counsel:	T. Meadows	

Interpreters:	S. Arnatsiaq	Inuktitut
	M. Arreak	Inuktitut
	G. Demers	French
	M. Hunt	Inuktitut
	L. Janes	Inuktitut
	A. Srouji	French
	J. Tucktoo-Lacasse	Inuktitut

Court Reporters: C. Funk
C. Longacre
T. Rizzoli

Sound Technicians: T. Bourque
G. Metuq
J. Veevee

Parties:
Proponent: Baffinland Iron Mines Corporation:

T. Paddon, President and CEO
M. Zurowski, Executive Vice President
M. Anderson, Vice President of Operations
E. Madsen, Vice President Sustainable Development
G. Missal, Vice President of Corporate Affairs
O. Curran, Director of Sustainable Development
J. Tigullaraq, Northern Affairs Manager
J. St. Paul-Butler, Environmental Analyst
M. Setterington, Terrestrial Wildlife Biologist
A. Pearce, General Manager of Human Resources
Q. Issuqangituq, Liaison Officer in Pond Inlet
D. McCann, Mary River Project site
K. Bergner, Legal Counsel
B. Armstrong, Legal Counsel
S. Walker, Consultant (AMEC)
F. Beaulac, Consultant (FPB Management)
B. LeDrew, Consultant (Sikumiut)
A. O'Toole, Consultant
V. Moulton, Consultant (LGL Limited)
R. Davis, Consultant (LGL Limited)
J. Binns, Consultant (HATCH)
B. Napier, Consultant
R. Cook, Consultant (Knight Piésold)
T. Keane, Consultant (Fednav Limited)
D. Brubacher, Consultant
M. Lepage, Consultant (RWDI)
M. Sheahan, Consultant (HATCH)

Nunavut Tunngavik Inc.:	J. Eetoolook, Vice President P. Irngaut, Wildlife Communications Advisor J. Ehaloak, Policy Analyst, Communication and Language
Qikiqtani Inuit Association:	O. Eegeesiak, President A. Qamaniq, Hall Beach Community Director J. Nutaruk, Pond Inlet Community Director E. Peter, Cape Dorset Community Representative J. Ikkidulak, Kimmirut Community Representative P. Paneak, Pond Inlet Community Representative L. Barnabus, Arctic Bay Community Representative S. Mikki, Igloolik Community Representative J. Natanine, Clyde River Community Director J. Fortier, Environmental Assessment Lead S. Awa, Mary River Project Coordinator S. Williamson Bathory, Director of Department of Major Projects D. Ingaut S. Qunatsiq H. Uniuksaraq J. Alooloo P. Panipakoochoo A. Kublu K. Nutarak N. Koonoo
Nunavut Planning Commission:	B. Aglukark, Director of Regional Planning C. Tickner, Senior Planner A. Blair, Legal Counsel
Government of Nunavut:	P. Suvega, Assistant Deputy Minister Sustainable Development, Executive and Intergovernmental Affairs C. Kieu, Legal Counsel D. Stenton, Director of Culture and Heritage R. Eno, Director of Environmental Protection Division J. Shirley, Manager of Research Design P. Hale, Manager of Wildlife Research M. Noreau, Senior Policy Counsel (Department of Justice) D. Carlson, Director of Department of Finances Fiscal Policy Division N. Strijak, Policy Analyst (Department of Health and Social Services) E. Prosh, Director of Mineral and Petroleum Resources R. Katsak, Department of the Environment and Transportation J. Price, Avatiliriniq Coordinator D. Lapierre, Manager of Environmental Assessment and Regulation (Department of Economic Development and Transportation) J. Daniel Blouin, Territorial Environmental Assessment Coordinator (Department of Environment)
Aboriginal Affairs and	R. Aitken, Regional Director General

Northern Development Canada:	K. Costello, Director of Resource Management M. Brisco, Manager of Impact Assessment A. Shen, Senior Impact Assessment, Analyst T. Fast, Socio-economic Analyst
Canadian Transportation Agency:	L. Fortin, Senior Environmental Officer
Department of Justice (Canada):	K. Landa, Legal Counsel
Environment Canada:	S. Forbrich, Manager of Environmental Assessment and Marine Programs A. Dunn, Senior Environmental Assessment Coordinator and Environmental Toxicologist J. Hodson, Environmental Assessment Coordinator For Canada Wildlife Service and Wildlife Biologist A. Wilson, Water Quality Biologist
Department of Fisheries and Oceans:	D. Moggy, Habitat Team Leader G. Williston, Habitat Management Biologist B. Ross, Regional Manager for Environmental Management in Major Projects R. Stewart, Research Scientist J. Lawson, Research Scientist V. Lesage, Research Scientist
Canadian Coast Guard:	P. D'Arcy, National Manager of the Icebreaking Program L. Trigatti, Regional Superintendent of the Environmental Response Program For the Central and Arctic Region
Natural Resources Canada:	D. McNabb, Director of Policy, Minerals and Metals Sector J. Clarke, Director of Environmental Coordinator A. Baker, Environmental Assessment Officer
Parks Canada:	J. Chisholm, Biologist and Environmental Assessment Coordinator, Nunavut Field Unit
Transport Canada:	H. Nikkel, Regional Director of Programs P. Topping, Manager of Environmental Protection C. Miller, Manager of Marine Safety J. Gascon, Director of Boat Safety D. Kirkland, Regional Manager of Programs D. Raymond, Regional Director of Marine B. Raitt, Manager of Safety Systems J. Cowan, Environmental Officer

Intervenors

Makivik Corporation:	A. Alaku, Executive Assistant to the Vice President of Renewable Resources G. Gilbert, Resource Management Coordinator
Nunavik Marine Region Impact Review Board:	P. Papigatuk, Chairperson M. Naseer, Regional Planner
Dr. Zacharius Kunuk	Z. Kunuk L. Lipsett, Legal Counsel
Registered Speakers:	
Royal Canadian Mounted Police	Chief Superintendent S. McVarnock, Commanding Officer of the RCMP, Nunavut
World Wildlife Fund	M. VonMirbach, Director of WWF's Canadian Arctic Program

For access to complete records of sign-in and attendance at all Hearing venues please visit the NIRB's ftp site at http://ftp.nirb.ca.

CHAIRPERSON'S FOREWARD

Although this report has been prepared by the Board for the Minister of Aboriginal Affairs and Northern Development Canada in fulfillment of Section 12.5.6 of the *Nunavut Land Claims Agreement* (NLCA), it is also the Board's sincerest hope that it will be of interest to all Nunavummiut and particularly to the many Elders, parties, intervenors and community members who shared their experience, their wisdom and their vision throughout the Board's Review of the Mary River Project Proposal.

During the Final Hearing, the Board heard concerns expressed that when facing development many Nunavummiut feel caught between two worlds: their hopes for development to yield lasting and sustainable benefits to individuals, communities, their region, Nunavut and Canada in general; and their concerns regarding potential negative impacts on the air, land, water, fish, wildlife, marine mammals, traditional areas, traditional ways and communities. The Board understands these hopes and concerns and sees thorough impact assessment as a way to bridge the gap between these worlds by ensuring that only development which will ensure the future well-being of Nunavut residents and that protects our land, water and resources be allowed to proceed.

On this basis, and after considering the extensive written material filed by the many participants referenced throughout the report regarding the potential ecosystemic and socio-economic effects of the Project Proposal, and after hearing the views of over 150 people who appeared on the record over the course of 11 days at the Final Hearing, the Board has concluded that the Mary River Project Proposal can proceed to the regulatory stage, in accordance with the terms and conditions included in this report.

The Board is grateful for the commitment and cooperation of all who contributed to this thorough and comprehensive review, including the Project Proponent, Baffinland Iron Mines Corporation, various federal, territorial and local government representatives, Nunavut Tunngavik Inc., the Qikiqtani Inuit Association, Elders, community representatives and members of the public; your contributions to this process, report and recommendations were invaluable. The Board is hopeful that the positive working relationships established as a result of this process will continue for many years to come.

In closing, I would also like to express my appreciation to the Board and Board staff for their hard work and dedication throughout this process.

Kind Regards,

Elizabeth Copland
Acting Chairperson
Nunavut Impact Review Board

EXECUTIVE SUMMARY

This report and recommendations relate to the Mary River Project Proposal, NIRB File No.: 08MN053 (the Project Proposal or Project), submitted by Baffinland Iron Mines Corporation to the Nunavut Planning Commission, the Nunavut Water Board and the Nunavut Impact Review Board (the NIRB or the Board) in March 20, 2008. As proposed, the Project involves the development of an open pit iron ore mine on northern Baffin Island, with associated infrastructure to include a tote road between Milne Inlet and a mine site at Mary River, ports at Milne Inlet and Steensby Inlet and a Railway connecting the mine to the Steensby port. Iron ore will be transported from the mine site via the Railway to the port at Steensby Inlet, with year-round shipping of ore through Foxe Basin and Hudson Strait to markets in Europe using custom designed ore carriers.

As set out in Article 12 of the Nunavut Land Claims Agreement (NLCA), the NIRB is responsible for assessing the extent of the potential environmental and socio-economic effects of the Project Proposal in order to determine whether the Project should proceed, and if so, to recommend the terms and conditions that should apply to the Project. In order to reach a decision, the Board conducted a thorough review of the Project Proposal, as required under Section 12.5.5 of the NLCA to consider all matters relevant to the NIRB's objectives and mandate. Throughout the NIRB's consideration of the Project, the Board has been guided by our central objectives: protecting and promoting the existing and future well-being of the residents and communities of Nunavut; and the protection of Nunavut's ecosystemic integrity.

As outlined in this report, over the course of the Board's Screening and Review, there were numerous opportunities for federal, territorial and local government representatives, designated Inuit organizations, community representatives, Elders and members of the general public to share their perspectives about the Project and about the potential effects, both positive and negative on communities and the environment of the Nunavut Settlement Area and adjacent jurisdictions. The Board considered this input, the extensive documentation filed regarding this Project, including the information contained within the draft and final Environmental Impact Statements filed by Baffinland Iron Mines Corporation, as well as the substantial written comments, information requests and final written submissions filed by formal intervenors. The NIRB also carefully considered comments, evidence and advice from community representatives, members of the public and formal intervenors throughout the Review, including hearing from over 150 people who appeared on the record during the NIRB's Final Hearing.

During the Board's review of the Project, a central theme emerged: This Project represents an unprecedented development for Nunavut and for Canada in many respects—the development of a Railway in arctic conditions, conducting year round shipping with purpose-built ice-breaking ore carriers that are considerably larger than any other ships that have travelled in Nunavut waters, a projected mine life greater than 20 years and the potential for billions of dollars in benefits and revenues to be shared by the federal and territorial governments and the land and mineral owners, the Qikiqtani Inuit Association and Nunavut Tunngavik Inc.

Given the unparalleled nature of the Project, the Board heard concern from many Review participants about uncertainty related to the predictions of environmental and socio-economic effects associated with the proposed activities, and as such, the Board was called on to apply the "precautionary

approach" to many aspects of this Review. In applying this approach, the Board required Baffinland Iron Mines Corporation to demonstrate that despite uncertainty, potential for significant adverse project effects could be limited by taking appropriate precautions and that improved accuracy for predictions could be gained through continued baseline data collection and ongoing adaptive management. From a practical perspective, the precautionary approach also requires the NIRB, Baffinland Iron Mines Corporation and all parties with regulatory and monitoring responsibilities for the Project to commit to an ongoing role for the life of the Project in relation to monitoring, assessing the effectiveness of measures designed to maximize positive effects and prevent or limit adverse effects and ensuring that these measures are reviewed and adapted where necessary to reflect the actual project effects being observed.

After due consideration of these factors and reflecting the Board's thorough review of this Project, the NIRB recommends to the Minister of Aboriginal Affairs and Northern Development Canada, that the Project may proceed to the regulatory phase. Further, as required under Section 12.5.6(c) of the NLCA, the Board has developed recommended Terms and Conditions considered necessary to prevent or mitigate the potential adverse environmental and socio-economic effects associated with the Project.

Through the course of the Final Hearing, Baffinland Iron Mines Corporation and other parties made significant commitments in respect of the Project that they are willing to meet to ensure the Project proceeds in the best manner possible; these commitments have been compiled into a "List of Commitments" (see Appendix A) for ease of reference. Some of these commitments have formed the basis for the NIRB's recommended Terms and Conditions, while some, for various reasons, such as limits on the NIRB's jurisdiction, have not. However, the NIRB wishes to clearly state that the Board has every expectation that Baffinland Iron Mines Corporation will fulfill **all** commitments made during the Final Hearing, within its Final Environmental Impact Statement and supporting documentation submitted during the Review, not just those commitments that were included in Terms and Conditions prescribed by the Board in this report.

ᓇᐃᓪᓕᒋᐊᖅᑕᐅᓯᒪᔪᖅ ᑐᓴᒐᒃᓴᖅ

ᐅᓇ ᑐᓴᒐᒃᓴᖅ ᐊᒻᒪᓗ ᐊᑐᓕᕐᑯᔭᐅᔪᓪᓗ ᓄᓘᔮᖕᓂ ᑐᒃᓯᕋᐅᑎᒃᑯᑦ ᐅᔭᕋᒃᑕᕐᕕᓕᐅᕐᕕᐅᔪᒪᓂᖓᓅᖓᔪᖅ, ᓄᓇᕘᒥ ᐊᕙᑎᔨᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᒃᑯᖏᓐᓄᑦ ᓈᓴᐅᓯᖅᑐᖅᑕᓯᒪᔭᖓᑦ ᐆᒥᙵ NIRB File No.: 08MN053 ᒥᑦ (ᑐᒃᓯᕋᐅᑎᒃᑯᑦ ᐱᓕᕆᐊᕆᓴᐅᔪᒪᔪᖅ ᐅᕝᕙᓘᓐᓃᑦ ᐱᓕᕆᐊᖅ), ᑐᒃᓯᖅᑑᑕᐅᒋᐊᙳᓚᐅᖅᓯᒪᔪᖅ ᐸᕝᕕᓐᓛᓐ ᐊᐃᔭᓐ ᐅᐊᕐ ᒪᐃᓐᔅ ᑯᐊᐳᕇᓴᒃᑯᓐᓄᑦ ᓄᓇᕘᒥ ᐸᕐᓇᐄᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ ᐊᒻᒪᓗ ᓄᓇᕘᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔩᓄᓪᓗ (NIRB ᑯᑦ ᐅᕝᕙᓘᓐᓃᑦ ᑲᑎᒪᔩᑦ) ᒫᔾᔨ 20, 2008ᖑᑎᓪᓗᒍ. ᑐᒃᓯᕋᐅᑎᖓ ᒪᓕᒡᓗᒍ, ᐅᔭᕋᒃᑕᕐᕕᓕᐅᓂᐊᖅᑐᑦ ᓄᓇᐅᑉ ᖄᖓᓂ ᐊᐃᔭᓐ ᐅᐊᕐᑕᕐᕕᐅᒃᑕᕐᕋᔭᖅᑐᒥ ᕿᑭᖅᑖᓗᐸ ᐅᐊᖕᓇᖅᐸᓯᐊᓂᒃ, ᐊᒻᒪᓗ ᓴᓇᓂᐊᖅᑕᖓᓄᑦ ᐃᓚᕐᑲᓯᐅᔾᔨᐅᓂᐊᕐᒥᔭᖅᑕᐅᑦᖅ ᐊᖅᑯᑦ ᓄᓇᓯᐅᑎᓄᑦ ᐊᒡᔭᖅᑐᖅᑐᓄᑦ ᐊᑐᖅᑕᐅᖃᑦᑕᕋᓴᓇᓪᓗᓂᑦᑕᐅᖅ ᕿᒻᒧᐊᓂᒃ ᓄᓘᔮᒃ ᐅᔭᕋᒃᑕᕐᕕᐊᓅᖓᓗᓂ, ᑐᓚᒃᑕᕐᕕᖅᑲᖅᑐᑎᒃ ᕿᒻᒧᐊᓂ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᒥᒍ ᓄᓇᓯᐅᑎᑯᑖᒧᓪᓗ ᐊᖅᑯᑎᓕᐅᖅᑕᖅᓴᕐᒥᔪᑦ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᕐᒎᖓᓇᓴᖅᑐᖅ ᑖᓐᓇ ᐊᖅᑯᓯᐊᖓ ᐅᔭᕋᒃᑕᕐᕕᖕᒥᑦ. ᓄᓘᔮᒃ ᐊᐅᓪᓚᕐᕕᖅᑲᕐᑕᖅᑐᓂ ᓄᓇᓯᐅᑎᑯᑖᒃᑯᑦ ᐊᒡᔭᖅᑐᖅᑕᐅᖅᑕᖅᓴᖅᑐᑦ ᐅᔭᕋᒃᑕᓚᐅᔪᓂᒃ ᐅᓯᔭᖅᐃᒃᐱᑭᑦᑐᕐᔪᐊᒃ ᑐᓚᒃᑕᕐᕕᐊᓄᑦ, ᐅᑭᐅᓕᒫᖅ ᐅᒥᐊᕐᔪᐊᐸᐅᔭᒃᑯᑦ ᐃᒡᓗᓕᐅᑉ ᐃᒪᖓᓂᒃ ᑕᕐᕋᐅᑉ ᐃᒪᖓᒍᓪᓗ ᑖᒃᑯᖓ ᑕᓇᐅᑉ ᐊᑭᐊᓂᕐᒥᐅᑕᓃᑦᑐᓄᑦ ᓂᐅᕕᐊᒃᓴᙳᖅᑎᑕᐅᒋᐊᖅᑐᑦ ᐅᐊᕐᑐᐃᓐᓇᕐᓂᒃ ᐅᒥᐊᕐᔪᐊᐸᐅᔭᒃᑯᑦ ᐅᓯᔭᓇᖅᑐᓂᒃ ᐊᒡᔭᖅᑐᖅᑕᐅᖅᑕᕐᓗᑎᒃ.

ᒪᓕᒡᓗᒍ ᐊᖏᕈᑎᓃᑦᑐᖅ 12ᒥ (NLCA), ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ ᖃᐅᔨᓴᕐᓇᐊᖅᑲᕐᓂᕐᒥᑦ ᐱᓕᕆᐊᖃᖅᑎᑕᐅᓯᒪᕗᑦ ᐊᕙᑎᒥᐅᑕᓃᑦᑐᑦ ᐊᒻᒪᓗ ᐃᓄᐃᓪᓗ ᐱᕙᓪᓕᐊᔾᔪᑕᐅᔪᒃᑯᑦ ᖃᓄᑎᒋ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔨᐅᓇᓴᕆᐊᖅᑎᕆᓂᒃ ᐃᓱᒪᒃᓴᖅᓯᐅᕈᑎᖃᖅᓂᐊᖅᔪᖅᑐᑎᒃ ᐱᓕᕆᐊᙱᐊᕆᓴᐅᔪᒪᔪᖅ ᑲᔪᓯᑎᑕᐅᓂᐊᕆᐊᙳᓴᓂᒃ ᑲᔪᓯᓂᐊᕿᓂᓗ, ᖃᓄᐃᑉᑎᓂᒃ ᐱᓕᕆᐊᖅᑭᒪᔪᖅ ᒪᓕᒋᐊᖃᖅᓴᕐᒪᖕᒑᕐᓗ, ᐱᓕᕆᐊᖃᓕᕈᓂ. ᐃᓱᒪᒃᓴᖅᓯᐅᙱᑦᖃᑭᓇᖅᓇᐊᖅᓴᖅᒥᒃ, ᑖᒃᑯᐊ ᑲᑎᒪᔩᑦ ᖃᐅᔨᓴᕐᓂᐊᖅᔭᐊᓯᐊᓗ ᑐᒃᓯᕋᐅᑎᒃᑯᑦ ᐱᓕᕆᐊᕆᓴᐅᔪᒪᔪᒥᑦ, ᒪᓕᒡᓯᓂᔅᔪᒃ 12.5.5 ᓄᓇᕗᒻᒥ ᓄᓇᑖᕐᓂᕐᒧᑦ ᐊᖏᕈᑎᓂᑦᑐᖅ ᐃᓱᒪᒃᓴᖅᓯᐅᕈᑎᖃᓇᐊᖅᑲᖅᑐᑦ ᑭᓯᓕᒫᓂᒃ ᑲᑎᒪᔩᑦ ᐱᓇᓱᐊᓚᓇᔪᒪᔭᖅᒋᓐᓃᑦᑐᑦ ᐱᓕᕆᐊᕆᓂᐊᖅᑐᕆᓴᖅᒋᓐᓃᑦᑐᓪᓗ. ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖅᒋᑦᑕ ᐱᓕᕆᐊᕆᓴᐅᔪᒪᔪᒥ ᐱᓇᓱᐊᓚᕆᓴᐅᔪᒪᓂᖓᓄᑦ ᐃᓱᒪᒃᓴᖅᓯᐅᕈᑎᖅᖅᓯᑎᒃ, ᑕᐃᒪᑦᑕᐅᖅ ᑲᑎᒪᔩᑦ ᐊᑐᖅᐊᖅᓯᓯᒪᖕᒥᔪᑦᑕᐅᖅ ᐱᓇᓱᐊᓚᕆᓴᐅᔪᒪᓯᑦᑎᓇᓃᑦᑐᓂᒃ ᐃᓱᒪᒋᖅᑲᓯᐅᖅᓯᓯᒪᓪᓗᑎᒃ ᒪᑯᓂᙳᑦ: ᓴᐳᒻᒥᒃᔩᓴᕆᐊᖃᖅᓂᖅ ᓴᖅᑭᔩᖅᑎᑦᓯᒋᐊᒃᑲᓇᓂᕆᐊᖃᖅᓂᖅ ᒫᓇᓗᑦ ᓯᕗᒃᓴᑯᑖᒧᓪᓗ ᓄᓇᕗᒻᒥᐅᑦ ᐃᓅᓯᖃᓯᒋᐊᕆᐊᖃᖅᓂᖅᒋᓇᓂᒃ ᓄᓇᑖᓪᓗ ᓄᓇᕗᒻᒥ ᓯᕗᓂᒃᓴᖃᑦᓯᐊᖃᖅᑲᑦᑕᐅᕙᓇᖅᑯᓪᓗᒥᑦ; ᐊᓴᐅᑦᓯᒃᑯᑦ ᓴᐳᒻᒥᒃᔩᒪᖃᑕᐅᓗᑎᒃ ᓄᓇᕗᑉ ᐊᕙᑎᒥᐅᑕᖅᒋᓇᓃᑦᑐᓖᑦ.

ᑕᒡᕙᓂ ᑐᓴᒐᒃᓴᒥ ᐅᖃᐅᓯᐅᑎᓪᓗᒍ, ᑲᑎᒪᔩᑦ ᕿᒥᕐᕈᖃᑎᒌᓚᐅᖅᓂᒋᓇᓂ ᐊᒻᒪᓗ ᖃᐅᓴᖅᑭᖃᖃᑎᒌᖕᓂᖕᒋᓇᓂᓪᓗ, ᐊᑕᐅᓯᐊᕋᑎᒃ ᐊᒥᓱᐊᖅᑎᖅᓱᑎᒃ ᑕᒪᒃᑯᐊ ᑲᓇᑕᒥ ᓄᓇᕘᒥᓗ ᓄᓇᓕᖕᓂᓗ ᒐᕙᒪᒃᑯᖏᓐᓄᑦ ᑭᒡᒐᖅᑐᐃᔨᒋᔭᐅᔪᑦ, ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᓪᓗ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᖏᓐᓄᑦ, ᓄᓇᓕᖕᓂᓗ ᑭᒡᒐᖅᑐᐃᔨᒋᔭᐅᔪᑦ, ᐃᓐᓇᕐᓂᕐᓄᑦ ᐃᓄᐃᓪᓗ ᖃᓄ ᐃᒪᓕᐅᖅᑕᕐᒪᖕᒋᑦ ᐱᓕᕆᐊᕆᓴᐅᔪᒪᔫᒃ ᒥᒃᓵᓅᖓᔪᓂᒃ ᐊᒃᑐᐃᑐᐃᓇᓇᕆᐊᖃᖅᓯᓂᖅᓯᓂᓪᓗ ᐅᖃᐅᓯᖃᖅᑎᑕᐅᕝᕕᖃᓯᐊᖃᑦᑕᖅᓯᒪᔭᐃᓇᓇᐅᔪᑦ, ᐊᑲᐅᓈᖅᑐᒃᑯᑦ ᐊᑲᐅᓈᙳᕐᓯᑦᑑᓗᐊᒃᑯᓪᓗᓇᓂᑦ ᓄᓇᓕᖕᓄᑦ ᐊᕙᑎᒥᐅᑕᓃᑦᑐᓄᓪᓗ ᓄᓇᕗᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᓂᖅᒋᓇᓃᑦᑐᑦ ᐊᑭᐊᓃᑦᑐᓪᓗ. ᑲᑎᒪᔩᑦ ᑕᒪᒃᑯᓂᓕ ᑎᑎᕋᖅᑕᐅᓯᒪᓂᑯᕕᓂᕐᓂᒃ ᑎᑎᕋᐅᑕᐅᓯᒪᓂᑯᕕᓂᕐᓃᑦᑐᓂᓪᓗ ᐱᓕᕆᐊᕆᓴᐅᔪᒪᔪᒎᖅᓴᔪᓂᒃ. ᐃᓚᖃᓯᐅᑎᓗᒋᑦ ᓯᕗᓪᓕᖅᐹᒥ ᑭᖑᓪᓕᖅᐹᒥᓗ ᐅᓂᒃᑳᓕᖕᓚᐅᓂᖅᑐᑦ ᖃᐃᑕᐅᓯᒪᔪᒪᔪᑦ ᐸᕝᕕᓐᓛᓐ ᐊᐃᔭᓐ ᐅᐊᕐ ᒪᐃᓐᔅ ᑯᐊᐳᕇᓴᒃᑯᓐᓄᑦ ᐃᓱᒪᒃᓴᖅᓯᐅᖃᖅᓯᐅᕐᓯᒪᕙᑦ ᐅᖃᐅᓯᐅᓂᑯᕕᓂᕐᓂᒃ, ᑎᑎᖃᑕᐅᓂᑯᕕᓂᓪᓗ

ᖃᐃᑕᐅᓯᒪᔪᑦ ᑎᒥᑦ ᓯᓚᑖᒨᖅᓯᒪᔪᓃᖅᒫᕐᓂᑯᓂᒃᑯ, ᑐᓴᕘᒃᓴᐅᑎᒃᓴᒃᑲᓐᓂᕐᓂᒃ ᑐᒃᓯᕋᐅᑕᐅᖃᑦᑕᕐᓂᑯᕕᓃᑦᑐᓪᓗ ᕿᖑᓪᓕᖅᐹᒥᒃᑯ ᖃᐃᑕᐅᓂᑯᕕᓃᑦᑐᓪᓗ. ᓄᓇᕗᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ ᐃᓱᒪᒃᓴᖅᓯᐅᕈᑎᖃᑦᓯᐊᖅᓯᒪᒐᑦᑕᐅᖅ, ᓴᖅᑭᖅᑎᑕᐅᓂᑯᐃᓪᓗ ᑕᑯᔭᒃᓴᑦ ᐅᖃᓖᖅᑕᐅᔫᒃᓴᑦ , ᐃᓱᒪᒃᓴᖅᓯᐅᕈᑕᐅᑦᓯᐊᖅᓚᐅᖅᑳᖅᓱᑎᒡᓗ ᐅᖃᐅᓯᐅᔭᕙᓃᓪᓗ, ᓄᓇᓕᖕᓂᓗ ᑭᒡᒐᖅᑐᐃᔨᓃᖅᒫᕐᓂᑯᕙᓂᓪᓗ ᓴᖅᑭᖅᑎᑕᐅᓯᒪᔪᑦ ᑎᑎᕋᖅᓯᒪᔪᓪᓗ, ᐃᓄᖕᓃᖅᒫᕐᓂᕙᓂᓂᕐᓂᒡᓗ ᑎᒥᒋᔭᐅᔪᓃᖅᒫᖅᑐᕙᓂᕐᓂᒡᓗ ᖃᐅᔨᓴᕈᑕᐅᑎᓪᓗᒍ ᑕᒪᓇ, ᐃᓚᕐᑲᓯᐅᑎᓗᒋᑦ ᐅᖃᓇᐊᖅᑐᖅᓯᒪᓂᑯᐃᑦ 150 ᐃᓄᐃᑦ ᓄᓇᕗᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ ᕿᖑᓪᓕᖅᐹᒥᑦ ᐃᓅᒋᐊᒃᑎᓪᓗᒍ ᑲᑎᒪᑎᕐᓯᒃᑲᐃᑎᓪᓗᒋᑦ.

ᑲᑎᒪᔩᑦ ᑖᑦᓱᒥᙵ ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᒥᑦ ᖃᐅᔨᓴᕈᑎᖃᖅᑎᓪᓗᒋᑦ, ᒪᓐᓇ ᐃᓱᒪᓐᓇᖃᑦᑕᓕᓚᐅᖅᓯᒪᔪᖅ: ᐅᓇ ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᖅ ᑕᑯᒃᓴᐅᑎᑦᓯᔫᔾᔭᓕᖅᓱᓂ ᒪᑐᒥᙵ ᓄᓇᕗᒥ ᑲᓇᑕᒥᒍ ᓯᕗᓪᓕᖅᐹᑦᓯᐊᒥᒃ— ᐅᑭᐅᖅᑕᖅᑐᒥ ᓄᓇᓯᐅᑎᑯᑖᑉ ᐊᖅᑯᓯᐅᕝᕙᐅᔪᒪᓂᖓᓐᓂᒃ ᐅᑭᐅᖅᑕᖅᑐᖅ, ᐅᑭᐅᓕᖕᒫᕐᓗ ᐅᒥᐊᕐᔪᐊᑦ ᐅᓯᖃᑦᑕᕋᔭᖅᑐᑦ ᓯᑯᓯᐅᕈᓐᓇᕐᓗᑎᒃ ᐅᐊᕐᑕᖅᑕᐅᕙᓪᓕᐊᔪᓂᒃ ᐊᔭᖅᑐᐃᓇᔭᖅᑐᑦ ᐊᖏᓂᖅᓴᒻᒪᕆᐊᓘᓗᑎᒃ ᐅᒥᐊᕐᔪᐊᑦ ᐊᓯᖏᓐᓂᒃ ᓄᓇᕘᑉ ᐃᒪᕐᑯᑎᖏᑦᑎᒨᖅᓯᒪᔪᓂᒃ, ᐅᔭᕐᑕᖅᑕᔭᖅᓱᑎᒃ ᐊᕙᑎᑦ ᐅᑭᐅᑦ ᐅᖓᑖᓂᒃ ᐊᒻᒪᓗ ᐃᑲᔫᓯᐊᖅᑖᕈᑕᐅᓪᓚᓇᑐᐃᓐᓇᓇᐊᖃᕐᓂᖕᒐᓂᒃᓗ ᑮᓇᐅᔭᓕᐅᕈᑕᐅᓪᓚᓇᒍᑕᐅᑐᐃᓐᓇᓇᐊᖃᖃᔭᕐᓂᖕᒐᓄᓪᓗ ᐊᒥᖅᑳᖅᑕᐅᓂᐊᕐᓗᑎᒃ ᐱᓕᐊᓐ ᑖᓚᐃᑦ ᐊᒥᓱᐊᖅᑎᐊᓗᒡᓗᑎᒃ ᑲᓇᑕᐅᑉ ᓄᓇᕗᓪᓗ ᓄᓇᖁᑎᖃᖅᑐᓄᓪᓗ ᓴᕙᖃᔭᒃᓴᖁᑎᖃᖅᑐᓄᓪᓗ, ᕿᑭᖅᑕᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔨᐊᖃᑎᒌᒃᑯᖕᒋᓐᓄᓪᓗ ᐊᒻᒪᓗ ᓄᓇᕗᑦ ᑐᙵᕙᒃ ᐃᓐᑯᐊᐳᓇᑎᑦᑯᓐᓄᓪᓗ.

ᑖᓐᓇ ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᓕᒫᓂᒃ ᐊᔾᔨᖃᙱᓐᓂᖓᓂᒃ, ᑲᑎᒪᔩᑦ ᖃᐅᔨᓴᖃᑕᐅᔪᓂᒃ ᑕᒪᑐᒥᙵ ᐊᒥᓱᒪᓕᖕᓂᒃ ᑐᓴᖅᑎᑕᐅᓯᒪᕗᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᑐᐃᓐᓇᓕᐊᖃᒃᑐᑦ ᓇᓚᐅᑦᓴᕈᑕᐅᓇᔭᖅᑐᑦ ᓇᑐᓇᖅᑐᑦ ᐊᒥᓵᓂᖅᒋᓐᓂᒃ ᐊᕙᑎᒥᐅᑕᓃᑦᑐᑦ ᐃᓄᐃᓪᓗ-ᐱᕙᓪᓕᐊᓂᒃᑯᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᑐᐃᓐᓇᓕᐊᖃᕐᓂᖅᒋᓐᓂᓪᓗ ᐱᓕᕆᐊᓕᔭᐅᔪᖅᑕᖃᓕᖅᓂᖅᐸᑦ ᑕᒪᑐᒥᙵ, ᑕᒪᓐᓇᐅᓂᖅᒐᓄᑦ, ᑕᐃᒪ ᑲᑎᒪᔩᑦ ᐅᖃᐅᔾᔭᐅᓯᒪᒍᑦ "ᐅᐱᓕᕆᔭᖃᑦᓯᐊᕐᑯᔭᐅᓯᒪᓪᓗᑎᒃ" ᐊᒥᓱᓂᒃᓄᑦ ᑖᑦᓱᒪ ᖃᐅᔨᓴᕈᑕᐅᓯᒪᓕᖅᑐᒨᖅᒐᔪᓂᒃ. ᑕᒪᑐᒥᙵ ᒪᓕᒃᓂᐊᕐᓗᑎᒃ, ᑲᑎᒪᔩᑦ ᐅᖃᓚᐅᖅᓯᒪᒍᑦ ᐸᕝᕙᓖᓐ ᐊᐃᔭᓐ ᐅᐊᕐ ᒪᐃᓐᓴ ᑯᐊᐳᓇᓵᒃᑯᓐᓄᑦ ᖃᓄᖅ ᑕᐃᒫᑦᓯᐊᖅ ᐱᓕᕆᐊᖃᔭᕆᐊᖏᓐᓂᒃ ᓇᓗᓇᖅᑑᑎᖃᐅᕋᓗᐊᖅᑎᓪᓗᒍ, ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᑐᐃᓐᓇᓕᐊᕇᑦ ᐊᒥᔫᖏᓐᓂᖅᓴᐅᑎᑦᓯᓗᑎᒃ ᐅᔾᔨᖅᑐᑦᓯᐊᕐᔫᒥᓗᑎᒃ ᐊᒻᒪᓗ ᐱᐅᓂᖅᓴᓂᒃ ᓇᓚᐅᑦᓴᕈᑎᒃᓴᓕᐅᕐᓗᑎᓪᓗ ᐊᕙᑎᒥᐊᑕᓃᑦᑐᓂᒃ ᖃᐅᔨᓴᕈᑎᒃᑲᓐᓂᖅᓴᓕᐅᖃᑦᑕᕐᓗᑎᒃ ᑲᑎᖅᓱᐃᖃᑦᑕᕐᓗᑎᓪᓗ ᖃᐅᔨᓴᕈᑎᕙᓂᕐᒥᒃ ᐊᐅᓚᑦᓯᑦᓯᐊᕙᓂᖅᓴᐅᖃᑦᑕᕐᓗᑎᓪᓗ. ᐊᑐᕐᓂᖃᕐᓂᐊᕐᓂᖅᒋᑦ ᑕᐅᑐᒃᓗᒋᑦ, ᑕᒪᓐᓇ ᐃᒪᐃᑎᑦᓯᓯᒪᖅᒥᔪᖅᑕᐅᖅ ᓄᓇᕗᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓂᒃ, ᐅᐱᓇᔭᖃᑦᓯᐊᕐᑯᔭᐅᓯᒪᓂᖅ ᒪᓕᒃᑐᒍ ᐸᕝᕙᓖᓐ ᐊᐃᔭᓐ ᐅᐊᕐ ᒪᐃᓐᓴ ᑯᐊᐳᓇᓵᒃᑯᓪᓗ ᑕᒪᐃᑕᒍ ᑎᒥᖏᔭᐅᔪᑦ ᒪᓕᒐᓕᕆᖃᑕᐅᖃᑦᑕᖅᑐᓂᒃ ᓇᐅᑦᓯᖅᑐᖃᑕᐅᖃᑦᑕᕐᓂᐊᖅᑐᓂᒡᓗ ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᒥᑦ ᐱᓕᕆᐊᖃᑎᖏᖃᑦᑕᕐᑯᔭᐅᓪᓗᑎᒃ ᓇᐅᑦᓯᖅᑐᐃᓂᕐᒥᑦ, ᖃᐅᔨᓴᖃᑦᑕᕐᓂᐊᕐᓂᕐᒥᒡᓗ ᐊᑲᐅᓂᖅᓴᒃᑯᑦ ᐱᓕᕆᐊᕆᔭᐅᖕᒫᖃᑦᑕᕆᐊᓇᕋᔭᖅᑐᓂᒃ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᑎᑦᓯᑦᑕᐃᓕᒫᔪᑎᒃᓴᐅᓇᔭᖅᑐᓂᒡᓗ ᓴᖅᑭᐊᑎᓇᓗᑎᒃ ᑕᐃᒫᒃ ᐱᓕᕆᐊᖃᖃᑦᑕᓇᐊᖃᕐᓂᕈᑎᒃ ᖃᐅᔨᓴᖅᑕᐅᖃᑦᑕᕐᓂᐊᕐᓗᑎᓪᓗ ᐊᓯᔾᔨᖅᑐᖅᑕᐅᔭᓇᐊᖃᓇᐊᖃᕐᓂᕋᐃᒍᑎᓪᓗ ᐊᓯᔾᔨᖅᑐᐃᖃᑦᑕᕐᓗᑎᒃ ᐱᓕᕆᐊᓇᔭᐅᔪᖅᑕᖃᖅᑎᓪᓗᒍ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᕙᓪᓕᐊᔪᖅᑕᖃᓕᖅᓂᕋᐃᒃᐸᑦ ᖃᐅᔨᒪᔭᐅᓯᒪᓕᖅᑐᓂᒃ.

ᐃᓱᒪᒃᓴᖅᓯᐅᕈᑕᐅᓯᐊᓚᐅᖅᑳᖅᑎᓪᓗᒋᑦ ᑖᒃᑯᐊ ᐊᒻᒪᓗ ᐃᓱᒪᕿᒃᓵᖅᓱᒍᓗ ᑲᑎᒪᔩᑦ ᖃᐅᔨᓴᕈᑎᒋᑦᓯᐊᓚᐅᖅᓯᒪᔭᖕᒫᓂᓪᓗ ᐆᒥᙵ ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔫᖕᒫᔪᒥᑦ, ᑕᐃᒪ ᓄᓇᕗᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ ᑲᓇᑕᒥ ᓄᓇᖃᖅᑳᖅᑐᓕᕆᔨᒃᑯᑦ ᐅᑭᐅᖅᑕᖅᑐᒥᓗ ᐱᕙᓪᓕᐊᔪᓕᕆᔨᓄᑦ ᒥᓂᔅᑕᖕᒫᓂᒃ ᐊᑐᑯᓕᖅᑯᔨᒍᕐᒫᓕᓯᒪᔪᑦ, ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᒥᑦ ᒪᓕᒃᑎᒨᖕᒫᔪᒃᑯᖑᓂᖅᒋᓐᓃᑦᑐᓂᒃ ᑲᔪᓯᖅᑯᔨᓪᓗᑎᒃ. ᐊᒻᒪᓗᑦᒋᐊᒃᑲᓂᖅᑕᐅᖅ, ᒪᓕᒡᓗᒍ 12.5.6(c) ᓄᓇᕗᒻᒥ ᓄᓇᑖᕐᓂᕐᒧᑦ ᐊᖏᕈᑎᓂᑦᑐᖅ, ᑲᑎᒪᔩᑦ

ᐋᖅᑭᑦᓯᓯᒪᓕᖅᑐᑦ ᒪᓕᒃᑕᐅᔪᒃᓴᓂᒃ ᑕᒪᒃᑯᐊ ᐊᕙᑎᒥᐅᑕᓂᑦᑐᑦ ᐃᓄᐃᑦᑐ -ᐱᕙᓪᓕᐊᓂᒃᑯᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᖅᑯᓇᒋᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᓪᔾᔭᐅᕐᒋᓐᓂᖅᓴᐅᔪᓐᓇᖅᑯᓪᓗᒋᓪᓘᓐᓃᑦ ᐱᓕᕆᐊᕆᔭᐅᔪᒧᑦ.

ᑕᒪᓐᓇ ᑭᖑᓪᓕᖅᐸᒥᑦ ᐃᓄᒋᐊᒃᑎᓪᓗᒍ ᑲᑎᒪᔾᔪᑕᐅᑎᓪᓗᒍ, ᐸᕕᓐᓖᓐ ᐊᐃᔭᓐ ᐅᐊᖅ ᒪᐃᓐᔅ ᑯᐊᐳᕇᓴᒃᑯᓪᓗ ᑕᒪᐃᑕᓗ ᑎᒥᒋᔭᐅᔪᑦ ᐱᓇᓱᐊᒐᕆᓂᐊᖅᑐᕆᔭᒥᓂᒃ ᓴᖅᑭᐊᑎᕆᓯᒪᔪᑦ ᑖᓐᓇ ᐅᓇ ᐱᓕᕆᐊᕆᔭᐅᔪᒪᔪᖅ ᐱᔾᔪᑎᒋᓪᓗᒍ ᑲᑎᒪᖅᑲᑎᒌᕐᓂᐊᖅᑐᕆᓯᒪᔪᑦ ᑕᒪᒃᑯᐊ ᓱᓇᑐᐃᓐᓇᐃᑦ ᑕᐃᒫᙵᐊᖅ ᐱᓕᕆᐊᕆᔭᐅᓂᖅᑲᕈᓐᓇᖅᑯᓪᓗᒋᑦ ᐱᒋᐊᖅᓂᕐᒪᓐᓂᒃ ᐱᒋᐊᖅᑐᒍ; ᑕᒪᒃᑯᐊ ᐱᓇᓱᐊᒐᕆᔭᐅᓂᐊᖅᑐᕆᔭᐅᔪᑦ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᓕᖅᑐᑦ “ᐱᓇᓱᐊᒐᕆᔭᐅᓂᐊᖅᑐᕆᔭᐅᓯᒪᔪᓃᑦᑐᑦ” (ᑕᑯᓗᒍ ᐊᐱᐊᓐᑎᒃᓴ A) ᑕᑯᔭᐅᑦᓴᐅᑎᒋᔪᓐᓇᓕᐊᕐᒍᓯᒪᔪᑦ. ᐃᓚᖏᑦ ᑕᒪᒃᑯᐊ ᐱᓕᕆᐊᕆᔭᐅᓂᐊᖅᑐᕆᔭᐅᓯᒪᔪᑦ ᐋᖅᑭᒃᓯᒪᔾᔪᑕᐅᓯᒪᓕᖅᑐᑦ ᒪᑐᒥᙱ ᓄᓇᕗᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᕐᒋᓐᓄᑦ ᒪᓕᒃᑕᐅᔪᒃᓴᓕᐊᕐᒍᑎᓯᒪᔪᓂᒃ, ᐃᓚᖏᓪᓗ, ᐊᔾᔨᒌᕐᒋᑦᑑᑏᑦ ᐱᔾᔪᑎᒋᓪᓗᒋᑦ, ᑭᒡᓕᓕᖅᑐᖅᑕᐅᓯᒪᔪᑦ ᓄᓇᕗᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᕐᒋᑦᑕ ᓴᙱᓂᖅᑖᖅᓯᒪᑎᑕᐅᕙᕐᒐᓐᓄᑦ, ᐋᖅᑭᒃᓯᓯᒪᕐᒋᑦᑐᑦ. ᑭᓯᐊᓂᑦᑕᐅᒻᖅ, ᓄᓇᕗᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᕐᒋᑦ ᑐᑭᓯᐅᒪᓵᓯᐊᖅᑯᔨᕗᑦ ᓂᕆᐅᕐᓂᐊᖅᑐᓇᓪᓗᑎᒡᓗ ᑖᒃᑯᐊ ᐸᕕᓐᓖᓐ ᐊᐃᔭᓐ ᐅᐊᖅ ᒪᐃᓐᔅ ᑯᐊᐳᕇᓴᒃᑯᑦ ᐱᓕᕆᐊᕆᓂᐊᖅᑐᕆᔭᐅᓪᓗᑎᒃ **ᑕᒪᐃᓐᓂᓕᒫᖅ** ᑭᖑᓪᓕᖅᐹᒥᑦ ᐃᓄᒋᐊᒃᑎᓪᓗᒍ ᑲᑎᒪᑎᓰᒃᑲᐃᑎᓪᓗᒋᑦ ᐅᖅᑲᐅᓯᕆᓚᐅᖅᓯᒪᔭᒥᓂᒃ, ᑭᖑᓪᓕᖅᐹᖅᓯᐅᑎᕐᒋᓐᓂ ᐊᕙᑎᒥᐅᑕᓂᑦᑐᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᑐᐃᓐᓇᕆᐊᖅᑲᖅᑐᑦ ᐅᓂᒃᑳᓕᐊᕐᒋᓐᓃᑦᑐᓂᒃ ᐊᒻᒪᓗ ᐃᑲᔫᑎᒋᒃᑲᓐᓂᕈᑎᒋᓂᐊᖅᑕᕐᒋᓐᓂ ᑎᑎᖅᑲᖅᑯᑎᕐᒋᓐᓃᑦᑐᓂᒡᓗ ᖃᐃᑕᕕᓂᕐᒋᓐᓃᑦᑐᑦ ᐅᓇ ᖃᐅᔨᓴᕈᑕᐅᓂᕐᒐᓐᓂ ᐱᒋᐊᖅᑐᒍ, nᑖᒃᑯᐊᑐᐊᕐᒍᕐᒋᑦᑐᑦ ᒪᓕᒃᑕᐅᔭᓇᐊᖅᑲᖅᑐᓃᑦᑐᓂᑐᐃᓐᓇᐅᕐᒋᑦᑐᖅ ᑲᑎᒪᔫᓐᓚᖅᑐᕕᓂᖅᓂᒃ ᐅᕙᓂ ᑐᓴᒐᒃᓴᐅᑎᒃᓴᓕᐊᓖᑦᑐᒥ.

SOMMAIRE

Le présent rapport et les recommandations qu'il contient concernent la proposition de projet de la rivière Mary portant le numéro de dossier CNER 08MN053 (ci-après la « proposition de projet » ou le « projet »), soumis le 20 mars 2008 par la société Baffinland Iron Mines Corporation à la Commission d'aménagement du Nunavut, à l'Office des eaux du Nunavut et à la Commission du Nunavut chargée de l'examen des répercussions (la « CNER » ou la « Commission »). Le projet, tel qu'il est proposé, consiste en l'extraction minière à ciel ouvert d'un minerai à haute teneur en fer dans le nord de l'île de Baffin, ainsi qu'en la construction des infrastructures qui y sont associées, notamment d'un chemin d'approvisionnement entre Milne Inlet et le site de la mine au bord de la rivière Mary, d'installations portuaires à Milne Inlet et à Steensby Inlet et d'une voie ferrée reliant le site de la mine au port de Steensby. Le minerai de fer sera transporté par chemin de fer du site de la mine au port de Steensby Inlet, avec transport à l'année du minerai par le bassin de Foxe et le détroit d'Hudson vers les marchés européens à l'aide de transporteurs de minerai sur mesure.

Comme l'indique l'article 12 de l'Accord sur les revendications territoriales du Nunavut, la CNER est chargée d'évaluer l'étendue des éventuelles conséquences environnementales et socioéconomiques du projet afin de déterminer si celui-ci devrait aller de l'avant et, si c'est le cas, de recommander les modalités et les conditions qui devraient s'y appliquer. Pour en arriver à une décision, la Commission a procédé à un examen détaillé de la proposition de projet, comme l'exige l'alinéa 12.5.5 de l'Accord sur les revendications territoriales du Nunavut afin d'étudier tous les points se rapportant aux objectifs et au mandat de la CNER. Pendant toute la durée de son étude, la Commission a tenu compte de ses objectifs centraux qui sont la protection et la promotion du bien-être actuel et futur des résidents et des communautés du Nunavut, ainsi que la protection de l'intégrité écosystémique du territoire.

Comme ce rapport l'indique, pendant que la Commission passait en revue et examinait le projet, les représentants des gouvernements fédéral, territoriaux et municipaux, les organismes Inuit désignés, les représentants de la communauté, les anciens et les membres du grand public ont eu de nombreuses occasions de partager leur point de vue au sujet du projet et d'éventuelles conséquences, positives et négatives, sur les communautés et sur l'environnement de la région du Nunavut et des provinces et territoires adjacents. La Commission a tenu compte de ces idées, d'une quantité importante de documents déposés au sujet du projet, y compris des informations contenues dans les versions préliminaires et finales des études d'impact environnemental déposées auprès de la société Baffinland Iron Mines Corporation, ainsi que d'un nombre important de commentaires, de demandes d'information et de conclusions écrites déposées par des intervenants officiels. La CNER a également pris attentivement en considération les commentaires, les preuves et les conseils émanant des représentants de la communauté, des membres du public et des intervenants officiels pendant toute la durée de l'étude, notamment en accordant audience à plus de 150 personnes dont les noms sont inscrits au dossier de l'audience finale de la CNER.

Un thème central se dégage de cette étude : ce projet représente, sous bien des aspects, une occasion sans précédent de développement pour le Nunavut et pour le Canada, notamment avec la construction d'un chemin de fer dans un climat arctique, le transport à l'année à l'aide de transporteurs de minerai brise-glace sur mesure, qui sont beaucoup plus gros que les autres navires ayant parcouru les eaux territoriales du Nunavut, le projet d'exploitation d'une mine pendant plus de vingt ans et des milliards de dollars de bénéfices et de revenus potentiels à partager entre les gouvernements fédéral et

territoriaux, les propriétaires fonciers et les propriétaires du minerai, soit l'Association Qikiqtani Inuit et Nunavut Tunngavik Inc.

Compte tenu de la nature sans précédent du projet, la Commission a pris le temps d'écouter les préoccupations de nombreux participants à l'étude quant au caractère incertain des prédictions au sujet des conséquences environnementales et socio-économiques liées aux activités proposées. D'ailleurs, la Commission a été appelée à adopter une « approche préventive » à l'égard de nombreux aspects de l'étude. Dans le cadre de l'application de cette approche, la Commission a demandé à la société Baffinland Iron Mines Corporation de démontrer que, malgré l'incertitude, il est possible de limiter d'importantes conséquences néfastes en prenant les précautions qui s'imposent et qu'il est possible d'obtenir des prédictions plus précises grâce à la collecte constante de données fondamentales et à une gestion adaptative à long terme. D'un point de vue pratique, l'approche préventive exige également que la CNER, la société Baffinland Iron Mines Corporation et toutes les parties ayant un rôle à jouer dans la réglementation et la surveillance du projet prennent l'engagement de s'investir pendant toute la durée de vie du projet dans la surveillance, dans l'évaluation de l'efficacité des mesures prévues pour maximiser les conséquences positives et prévenir ou limiter les conséquences indésirables et dans l'assurance que ces mesures seront revues et adaptées si nécessaire pour refléter les conséquences réellement observées dans le projet actuel.

Après avoir examiné attentivement tous ces facteurs et réfléchi aux conclusions de cette étude approfondie, la CNER recommande au ministère fédéral des Affaires autochtones et du Nord que le projet passe à l'étape de la réglementation. De plus, comme l'exige l'article 12.5.6 c) de l'Accord sur les revendications territoriales du Nunavut, la Commission a recommandé les modalités et les conditions jugées nécessaires pour prévenir ou atténuer les éventuelles conséquences négatives sur le plan environnemental et socio-économique.

Tout au long de l'audience finale, la société Baffinland Iron Mines Corporation et d'autres parties ont pris l'engagement de se réunir pour veiller à ce que le projet se réalise dans les meilleures conditions possibles. Ces engagements ont été répertoriés dans une « liste d'engagements » (voir à l'annexe A) pour en faciliter la consultation. Certains de ces engagements ont servi de fondement aux modalités et aux conditions recommandées par la CNER, alors que d'autres non, pour diverses raisons, par exemple les limites de la compétence de la CNER. Toutefois, la CNER tient à préciser clairement que la Commission a tout lieu de croire que la société Baffinland Iron Mines Corporation respectera **tous** les engagements pris lors de l'audience finale, dans son étude d'impact environnemental et dans les documents justificatifs présentés au cours de l'étude, et pas uniquement les engagements faisant partie des modalités et conditions recommandées par la Commission et mentionnées dans le présent rapport.

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Photo 1: Board Members (from left) Henry Ohokannoak, Phillip Kadlun, Kaviq Kalluraq, Elizabeth Copland, Allen Maghagak, Guy Alikut

1. INTRODUCTION

1.1 Project Overview[1]

The Mary River Project Proposal, NIRB File: 08MN053 (Figure 1) (the Project or Project Proposal) consists of the proposed construction, operation, closure, and reclamation of an open pit mine and associated infrastructure for the extraction, transportation and shipment of high grade iron ore from a deposit located on the North Baffin Island, in the Qikiqtaaluk Region of Nunavut. The proposed mine site would be 280 kilometres from Arctic Bay, 415 kilometres from Clyde River, 192 kilometres from Hall Beach, 155 kilometres from Igloolik, 1000 kilometres from Iqaluit and 160 kilometres from Pond Inlet. The Proponent of the Mary River Project is Baffinland Iron Mines Corporation (the Proponent or Baffinland).

The iron ore deposit, Deposit No. 1 consists of an estimated 365 Mt (million tonnes) of direct shipping iron ore with an average iron grade of 64.66%. The Project would involve the production and shipment of an estimated 18 million tonnes-per-annum (Mt/a) of high grade iron ore from Deposit No. 1. The Proposal indicates that the high grade iron ore from this deposit is suitable for shipment to international markets after crushing and screening with no requirement for additional processing. Deposit No. 1 is estimated to be sufficient to meet the production design for an operating period of 21 years.

After crushing and screening, the Proponent proposes to transport the iron ore from the mine via a 150 kilometre Railway that would be constructed between the mine site and an all season deep water port to be located at Steensby Inlet. Upon reaching Steensby Port, the iron ore would be loaded from the rail cars into purpose-built ore carrying vessels with ice-breaking capabilities for shipment to European customers.

During the construction period, material, equipment and supplies required for the construction at the mine site and the northern portion of the Railway would be received via a port site at Milne Inlet. A freight dock would be constructed at Milne Port. At the onset of the Project, much of the construction material and supplies, fuel and mining equipment would be received at Milne Port during the open water season. Milne Port and the existing Milne Inlet Tote Road linking the mine site to Milne Port would be upgraded to improve access from the Milne Port to the mine site. It is proposed that Milne Port would operate during the open water season while Steensby Port would operate year round. Once Steensby Port is operational, Milne Port would only be used occasionally for the delivery of oversized equipment to the mine site.

The Project would include the following major phases:

- Construction, which is projected to take four years;
- Operations, which is projected to last approximately 21 years;
- Closure, which is projected to take 3 years and Post-Closure Monitoring, which is projected to last for 5 years, and if closure objectives are not met, could extend beyond 5 years.

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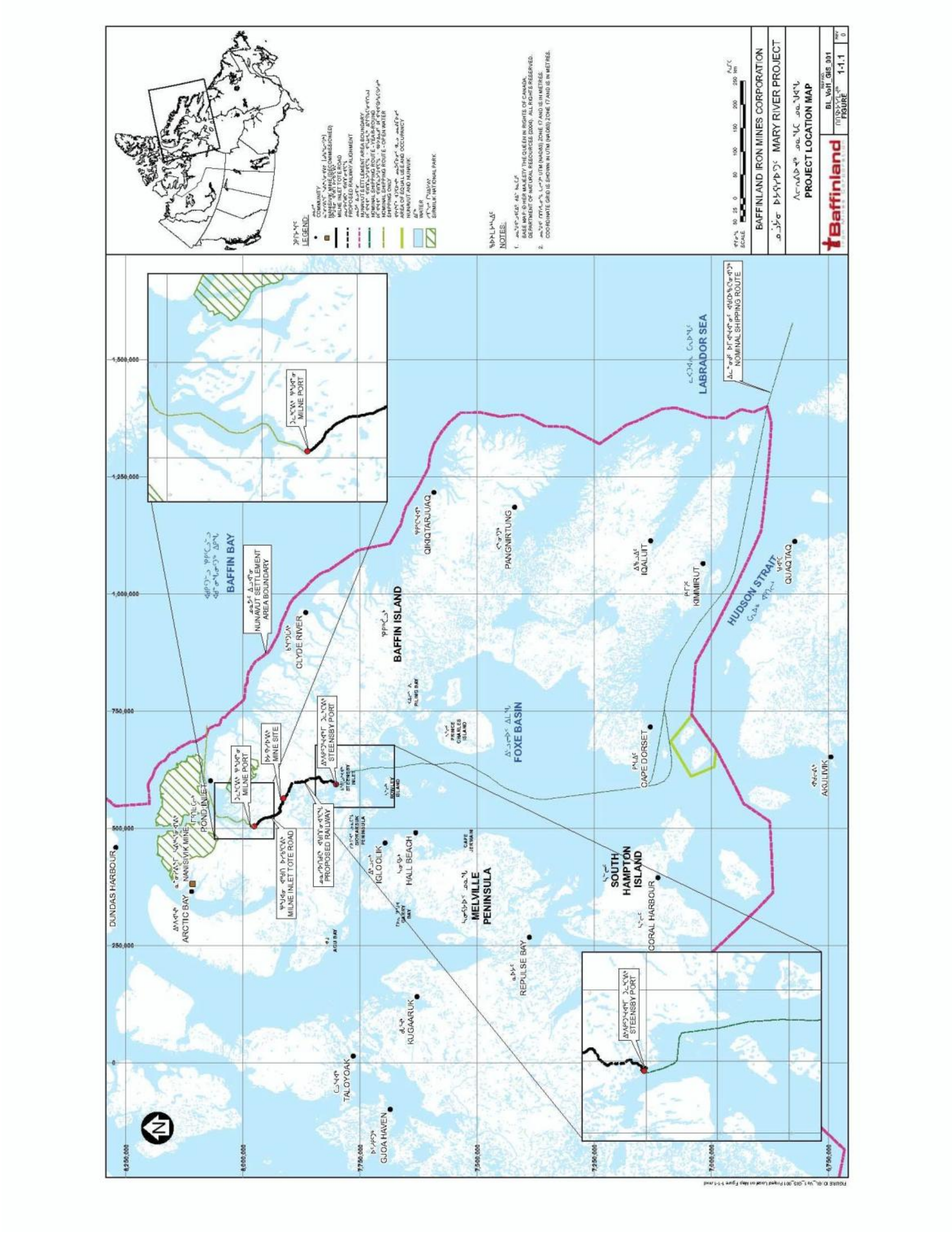
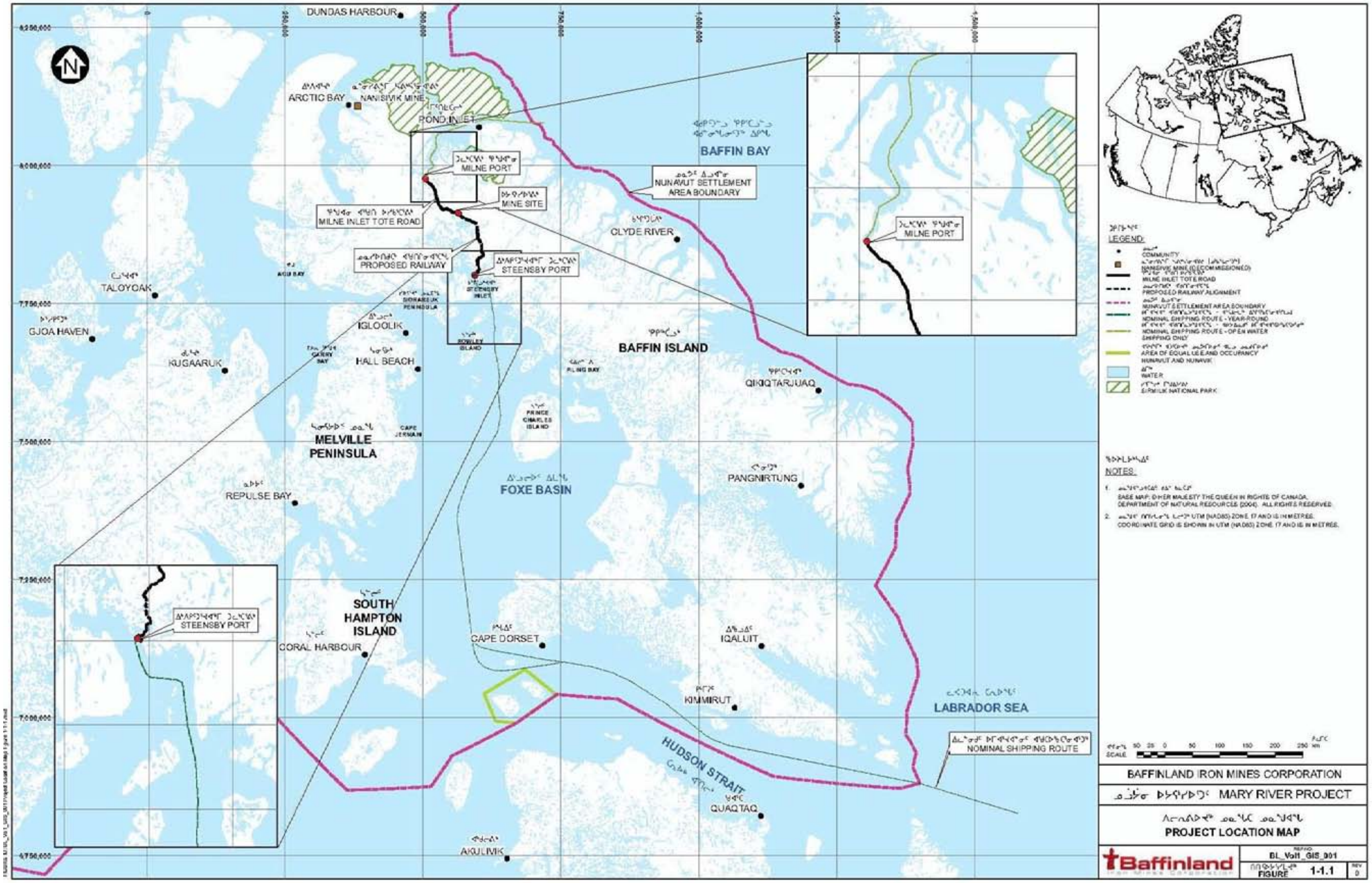
[1] Unless otherwise stated, the information presented in the Project Overview is based solely on the information as provided by the Proponent in the Project Proposal and Final Environmental Impact Statement (FEIS).

Figure 1: Project Location Map, FEIS Figure 1-1.1




DUNDAS HARBOUR
ARCTIC BAY
NANISIVIK MINE
POND INLET
BAFFIN BAY
MILNE PORT
NUNAVUT SETTLEMENT AREA BOUNDARY
MINE SITE
MILNE INLET TOTE ROAD
CLYDE RIVER
PROPOSED RAILWAY
STEENSBY PORT
TALOYOAK
GJOA HAVEN
IGLOOLIK
KUGAARUK
HALL BEACH
BAFFIN ISLAND
QIKIQTARJUAQ
MELVILLE PENINSULA
PRINCE CHARLES ISLAND
PANGNIRTUNG
REPULSE BAY
FOXE BASIN
SOUTH HAMPTON ISLAND
CORAL HARBOUR
CAPE DORSET
IQALUIT
KIMMIRUT
LABRADOR SEA
HUDSON STRAIT
NOMINAL SHIPPING ROUTE
QUAQTAQ
AKULIVIK
LEGEND:
COMMUNITY
NANISIVIK MINE (DECOMMISSIONED)
MILNE INLET TOTE ROAD
PROPOSED RAILWAY ALIGNMENT
NUNAVUT SETTLEMENT AREA BOUNDARY
NOMINAL SHIPPING ROUTE - YEAR-ROUND
NOMINAL SHIPPING ROUTE - OPEN WATER SHIPPING ONLY
AREA OF EQUAL USE AND OCCUPANCY NUNAVUT AND NUNAVIK
WATER
SIRMILIK NATIONAL PARK
NOTES:
1. BASE MAP: ©HER MAJESTY THE QUEEN IN RIGHTS OF CANADA, DEPARTMENT OF NATURAL RESOURCES (2004). ALL RIGHTS RESERVED.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
SCALE
BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT
PROJECT LOCATION MAP
Baffinland
BL_Vol1_GIS_001
FIGURE 1-1.1
REV 0

1.2 Procedural History

1.2.1 Key Procedural Steps in the Screening and Review of the Project Proposal

Figure 2 that follows provides a summary of the key procedural steps associated with the NIRB's screening and review of the Mary River Project Proposal, commencing with the receipt of the Project Proposal from the Proponent on March 20, 2008 and continuing through to the completion of the Final Hearing on July 28, 2012. Figure 2 identifies key milestones, opportunities for involvement of the public, parties and intervenors throughout the NIRB's screening and review process and the timelines associated with the various screening and review activities.

This summary is not exhaustive, and parties wishing to develop a more complete understanding of the activities associated with the screening and review process associated with the Project Proposal are encouraged to consult the complete listing of all documentation related to the Project available from the NIRB's public registry. Copies of the specific documents referenced in the listing and associated with the NIRB's Review of the Mary River Project can be accessed online from the Board's public registry using the following link: http://ftp.nirb.ca

Figure 2: Procedural History

Screening Step		Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
		Nunavut Impact Review Board (NIRB)	03/20/08	NIRB, NPC and Nunavut Water Board (NWB) receive Project Proposal from Baffinland (Proponent)	*Conformity determination required for area of project located in North Baffin Regional Land Use Planning area*
1	**Conformity Determination**	Nunavut Planning Commission (NPC)	30/04/08	NPC issues positive conformity determination for the Project Proposal	*Joint NPC/NIRB review of transportation corridor by NIRB and NPC required*
2	**Screening**	NIRB	30/04/08	NIRB Screening begins	*NIRB Screening Process must await NPC conformity determination*
			02/05/08	Project Proposal released for public comment	
		Public/Parties/ Intervenors	13/06/08	Comments on Project Proposal received from the public and interested parties	*Comment deadline extended at the request of parties from 23/05/08 to 13/06/08*
		NIRB	27/06/08	NIRB Screening Decision Report recommending review submitted to the Minister	*NIRB requests extension from Minister to 45-day Screening deadline on 13/06/08*
		Minister (INAC)	11/02/09	Minister refers project to NIRB for review	*Minister directs NIRB/NPC to develop joint review process to avoid delays*

Review Step		Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
1	**Community Scoping**	NIRB	13/03/09	*Draft* Scope of Project Proposal released for public comment	*Delayed as NIRB/NPC joint process developed; Joint Review Process Map released 16/03/09*
		Public/Parties/ Intervenors	09/04/09	Comments received from parties on *Draft* Scope	
		NIRB	28/03/09 - 10/05/09	Public Scoping meetings, open houses held in potentially affected communities	*Meetings held in 11 Nunavut Communities*
			18/06/09	Scoping Meeting Summary Report issued	

Review Step	Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
2 Guidelines Development	NIRB	24/06/09	*Draft* Environmental Impact Statement (EIS) Guidelines released for comment	*Draft EIS Guidelines contain input from public scoping sessions*
	Public/Parties/ Intervenors	04/08/09	Comments received from parties on *Draft* EIS Guidelines	
	NIRB	04/09/09	*Revised Draft* EIS Guidelines released for comment	*Additional scoping meetings held for 7 Nunavik communities (northern Quebec)*
	Public/Parties/ Intervenors	21/09/09	Comments received on *Revised Draft* EIS Guidelines	
	NIRB	29/09/09 - 30/09/09	EIS Guidelines Development Workshop	*Held in Iqaluit*
		16/11/09	EIS Guidelines issued to Proponent	*Appendix includes NWB SIG (MM3) and NPC NBRLUP requirements*
		24/11/10	Addendum to EIS Guidelines issued to Proponent	*Issued at Proponent's request, for "Road Haulage Option" alternative*
3 Draft EIS (DEIS)	Proponent	21/01/11	Proponent develops and submits DEIS to NIRB	*DEIS contains Draft Type A Water Licence application*
4 Conformity Review of DEIS	NIRB	15/02/11	NIRB issues positive conformity decision, accepts and distributes DEIS to parties	
	Public/Parties/ Intervenors	17/03/11	Information Requests (IRs) on the DEIS provided by parties	*IRs request additional information from Proponent and other parties prior to Technical Review*
	NIRB	24/03/11	NIRB forwards approved Information Requests (IRs) to Proponent and other parties for response	*All parties given 30 days to respond to IRs*
5 Technical Review of DEIS	Proponent	05/07/11	Proponent develops response to IRs and submits to NIRB	*60-day Technical Review Period of DEIS commences*
	Public/Parties/ Intervenors	05/10/11	Technical Review comments on the DEIS received from parties	*Deadline for Technical Review Period extended at the request of the parties from 06/09/11 to 05/10/11*
	Proponent	14/10/11	Proponent submits response to technical review comments to NIRB	*To help facilitate Technical Meeting*

Review Step		Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
6	**Technical Meeting**	NIRB	18-20/10/11	Technical Meeting (TM)	*Held in Iqaluit with participation by NWB*
		Proponent	04/11/11	Proponent submits finalized listing of commitments arising from TM and reflecting comments of parties	
7	**Pre-Hearing Conference**	NIRB	6-10/11/11	Community Roundtables and Pre-Hearing Conference (PHC)	*Held in Pond Inlet & Igloolik with participation by NPC and NWB*
			09/12/11	NIRB issues PHC decision	
8	**Final EIS (FEIS)**	Proponent	09/12/11-14/02/12	Proponent develops FEIS	
9	**Compliance Review of FEIS**	NIRB	14/02/12	NIRB receives FEIS; PHC Compliance Review begins	*FEIS contains Type A Water Licence application*
10	**Technical Review of FEIS**	NIRB	29/02/12	NIRB issues positive PHC compliance decision; accepts and distributes FEIS	*90-day Technical Review Period commences, parties given 30 days to submit IRs*
		Public/Parties/ Intervenors	02/04/12	Information Requests (IRs) on the FEIS provided by parties	*IRs request additional information from Proponent and other parties prior to Technical Review*
		NIRB	05/04/12	NIRB forwards approved IRs to Proponent	*Additional IRs also forwarded to other parties for response*
		Proponent	19/04/12	Proponent provides response to IRs	
		NIRB	01-03/05/12	Technical Meeting	*Held in Iqaluit; some parties in attendance by teleconference*
			08/05/12	Public Notice of the Final Hearing issued	*Notice includes information regarding how to seek formal intervenor status at the Hearing*
		Public/Parties/ Intervenors	18/05/12	Applications for Intervention Status filed	*Intervenor applications received from Makivik Corporation, Nunavik Marine Region Impact Review Board and Dr. Zacharius Kunuk*
		NIRB	25/05/12	Intervenor Status granted to the applicants	
		Public/Parties/ Intervenors	30/05/12 & 08/06/12	NIRB receives final written submissions from parties and Intervenors	
11	**Final Hearing**	NIRB	16-28/07/12	Final Hearing	*Held in Iqaluit, Pond Inlet and Igloolik*

1.2.2 Applications for Activities to Be Excepted from the Review

Section 12.10.1 of the Nunavut Land Claims Agreement (NLCA) establishes that, during the review process no licence or approval that would be required in order to allow a proposed project to proceed (e.g., water licences, authorizations under the Federal Fisheries Act, land lease agreements with land owners, etc.) shall be issued by an authorizing agency in respect of the project until after the required review has been completed and a NIRB Project Certificate has been issued. However, this general prohibition is modified by Sections 12.10.2 and 13.5.5 of the NLCA that allow for approvals or licences to be issued prior to the completion of a NIRB review under specific circumstances, including where the proposed activities are related to exploration or development connected to the project under review and the activity can, in the judgement of the NIRB proceed without such a review.

On September, 16, 2011, the Proponent filed a formal application under Section 12.10.2(b) of the NLCA to request an exception from the NIRB that would enable the Proponent to proceed with various works, described by the Proponent as the “pre-development works” prior to the completion of the Review. The activities included in the application were described as consisting primarily of construction laydown areas, fuel storage, access roads, and transporting and receiving materials at each of the Mary River Project sites, Milne Inlet, Mary River Mine Site, Steensby Port, and the Railway corridor construction camps. The specific listing of activities provided in the application included the following:

- Shipping of equipment and material during the open water season August to mid October 2012 and the receipt of equipment and material at both Milne Inlet and Steensby Inlet Project sites;
- The development of infrastructure at Milne Inlet, Steensby site and the Mine Site for receiving and storing equipment and material that would be used for the construction of the Project if approved, including:
- The airstrip and access roads required to provide all-season access to the Project sites for transportation of personnel;
- The construction of winter ice roads for temporary access to the Railway camp site during the 2012-2013 winter;
- Earthworks (earth/ground movement activities such as clearing, grading, contouring, etc.) to support these development activities at each Project site;
- Construction of adequate storage facilities to ensure availability of supply between the shipping seasons (fuel, bulk construction material, equipment, etc.); and
- Accommodation for housing of personnel involved in these activities (including camp, complete with kitchen, water supply, sewage treatment, waste disposal, first aid and recreational facilities).

In response to the application, the NIRB issued a letter on September 22, 2011 to the project specific distribution list acknowledging the receipt of the application and inviting parties to file their comments on the associated activities by October 28, 2011 (the NIRB extended this deadline to November 4, 2011 at the request of the parties). The exception application was discussed by parties, community representatives and members of the public during the NIRB’s Review of the larger Mary River Project

Proposal at the Technical Meeting in Iqaluit (October 18-20), as well as at Community Roundtable and Pre-Hearing Conference meetings in Igloolik and Pond Inlet (November 6, 7, 9 and 10).

Written comments were received on the application from Nunavut Tunngavik Inc., the Qikiqtani Inuit Association, the Government of Nunavut, Aboriginal Affairs and Northern Development Canada, Environment Canada, Fisheries and Oceans Canada and Natural Resources Canada. On the basis of information gaps and technical issues raised by the parties, the community and the Board, on November 14, 2011 the NIRB requested that Baffinland provide a response to the comments made by parties and additional questions raised by the Board. On November 24, 2011 the Proponent provided its response and indicated that having heard from the parties and the community, Baffinland recognized that the perceived risks associated with seeking approval for all of the works proposed were too significant. As such, the Proponent indicated it was considering significantly reducing the scope of the proposed works, and re-submitting an amended application to the NIRB.

On December 14, 2011 Baffinland formally withdrew its original Section 12.10.2(b) application. On January 3, 2012 the Proponent filed a new application, titled “Mary River Project 2012 Work Plan” with the NIRB that was significantly reduced in scale in terms of the exploration and development works proposed compared to the original application package. The NIRB requested comments on the new application be submitted to the Board on or before February 13, 2012 (later extended to February 27, 2012 at the request of the parties). Comments on the new application were received from the Qikiqtani Inuit Association, the Government of Nunavut, Aboriginal Affairs and Northern Development Canada, Environment Canada, Fisheries and Oceans Canada and Transport Canada.

On March 5, 2012 the Board issued a determination regarding the “Mary River Project 2012 Work Plan” exception application, partially granting the Proponent’s request for an exception, for all activities proposed in the new application but excluding, on the basis of regulatory issues and significant public concern, the proposed overwintering of a 10 million litre fuel barge in Steensby Inlet. On March 9, 2012 the Proponent provided the NIRB with an update regarding their intentions related to the activities proposed in the “Mary River Project 2012 Work Plan” indicating that they would not be pursuing the activities in the application except for those activities which had previously been approved under existing permits, licences and approvals and that did not require new regulatory authorizations.

All materials received by the NIRB and pertaining to the section 12.10.2(b) applications for this Project are available from the NIRB’s online public registry at the following link: http://ftp.nirb.ca

1.3 Purpose of this Report

This Final Hearing Report presents the results of the NIRB’s review of the Mary River Project. It includes the NIRB’s conclusions and recommendations to the Minister, reflecting the Board’s authority under the Nunavut Land Claims Agreement (NLCA). The Board is satisfied that it has complied with its obligations under the NLCA and that it has sufficient information to draw conclusions and make recommendations regarding the potential effects of the project.

The reporting parameters for the Board's determination are found in section 12.5.6 of the NLCA:

> 12.5.6 After reviewing the project proposal, NIRB shall issue a report to the Minister and the proponent containing:
>
> (a) its assessment of the project and its impacts;
>
> (b) its determination as to whether or not the project should proceed based on its assessment under (a); and
>
> (c) in the event the project were to proceed, terms and conditions reflecting the primary objectives set out in Section 12.2.5.

1.4 Jurisdiction of the Board

The Board has jurisdiction over the review of this Project pursuant to Article 12, Part 5 (Review of Project Proposals by NIRB) and Part 12 (Application) of the NLCA.[2] When a Review is required under Part 5, Section 12.10.1 of the NLCA prohibits the issuance of licences or approvals required to allow a project to proceed until after the Review has been completed and a NIRB project certificate is issued.

1.5 The Mandate of the Board

Section 12.2.5 of the NLCA states that:

> In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall take into account the well-being of residents of Canada outside the Nunavut Settlement Area.

In the present context, the function of the Board is to gauge and define the extent of the regional impacts of the Project Proposal, including a review of the ecosystemic and socio-economic impacts of the Project, to determine if the Project should proceed, and if so, under what terms and conditions. Reflecting the provisions of the NLCA, in carrying out this function, the NIRB's primary objective is at all times the protection and promotion of the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and protecting the ecosystemic integrity of the Nunavut Settlement Area.

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[2] As directed in the letter of the Honourable Chuck Strahl, then-Minister of Indian and Northern Affairs Canada, dated February 11, 2009, referring the Project Proposal to the NIRB for a review of the ecosystemic and socio-economic impacts under Part 5 of Article 12 of the NLCA.

1.6 Evidentiary Issues

1.6.1 The Burden and Standard of Proof

The burden of persuading the Board that the Project can, in the Board's judgment, proceed, rests with the Proponent. The community, Elders and Intervenors do not have the onus of persuading the Board that the Proponent has not satisfactorily assessed the anticipated ecosystemic or socio-economic impacts and environmental effects of the Project, or that the steps to avoid and mitigate or compensate for adverse impacts are insufficient. Rather, it is the responsibility of the Proponent, in whose interest the application has been filed, to prepare an impact statement that fully reflects the NIRB-issued guidelines and Minister's direction so that the Board may conduct a full review of the matters relevant to its mandate[3] and determine whether the Project may proceed, and if so, on what terms and conditions.

The standard of proof in this Hearing requires a careful balancing of all of the evidence presented in writing and at the Final Hearing. However, the onus remains on the Proponent to demonstrate that it is consistent with the Board's mandate and requirements of the NLCA.

1.6.2 The Precautionary Principle and Adaptive Management

With respect to areas where there are substantial gaps in data or uncertainty regarding predicted effects, the Board is guided by the "precautionary principle". In Canadian environmental assessment decisions and case law, the most widely cited description of the precautionary principle is found in Principle 15 of the Rio Declaration on Environment and Development (1992): "Where there are threats of serious or irreversible damage, lack of full scientific certainty *shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*" [emphasis added]. [4] This version of the principle has been cited by the NIRB in the past, and was cited in the EIS Guidelines issued by the NIRB for the Mary River Project Proposal.

When the precautionary principle applies, as is the case here with respect to some predicted effects, it is the project proponent who bears the burden of proof to show that despite the uncertainty, the potential adverse environmental impacts can be mitigated or reversed. The burden on the Proponent created by the precautionary principle in the case of the Mary River Project Proposal was laid out in the NIRB's EIS Guidelines. The EIS Guidelines required the Proponent to:

- Demonstrate that the proposed actions are examined in a precautionary manner in order to ensure that they do not cause serious or irreversible damage to the environment;

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3 See sections 12.5.1 and 12.5.2 of the NLCA.
4 UN (United Nations). 1972. Rio declaration on environment and development. In: Report of the United Nations Conference on the Human Environment, Stockholm; pp. 5-16.

- Outline the assumptions made about the effects of the proposed actions and the approaches to minimize these effects;
- Identify any follow-up and monitoring activities planned, particularly in areas where scientific uncertainty exists in the prediction of effects; and
- Present public views on the acceptability of these effects.

The application of the precautionary principle in environmental decision-making results in decisions which reflect the potential for adverse environmental impacts, even though the risk of such impacts cannot be definitively proven. In the context of environmental assessment and project approvals, implementing a precautionary approach to decision-making also generally involves the adoption of "adaptive management" tools to address the potential for adverse impacts that are not fully understood at the time a project is proposed and reviewed.

Adaptive management is an ongoing process of decision-making that involves making initial decisions based on the existing data, subsequently monitoring for potential effects, assessing the effectiveness of the initial decisions (including assessing the effectiveness of mitigation measures) and then adjusting actions going forward to reflect the monitoring data and the effectiveness of measures taken to minimize adverse effects. Adaptive management provides the basis for sound environmental decision-making even in the face of uncertainty surrounding the nature and extent of effects that is often inherent at the environmental assessment stage. Adaptive management enables such projects to proceed, but in a manner that ensures the mechanisms chosen to manage the predicted effects are adjusted, when necessary, to reflect subsequent information that provides a more complete understanding of the nature, extent and appropriate management of such effects. The implementation of adaptive management is both consistent with, and supported by, NIRB's project monitoring jurisdiction as set out in Part 7 of Article 12 of the Nunavut Land Claims Agreement (NLCA). In addition, Part 8 of Article 12 of the NLCA expressly recognizes the need for flexibility in relation to project certificates developed by the NIRB, and provides the NIRB with the jurisdictional basis to revisit and modify, as required to meet the Board's objectives, the terms and conditions of a project certificate.

This approach is also consistent with the expectations of many of the key participants in this Review. As emphasized by the Qikiqtani Inuit Association submission to the NIRB, the adoption of adaptive management is considered critically importance in the context of this Review:

> *… we insist on development that is environmentally sound, respects our culture, provides a real and sustained benefits, and adopts a management philosophy that is receptive to operational adjustments when required. This will only benefit the Baffinland and the people of this region. We believe that the communities can grow and prosper, and as long as we do things right, that is why we place so much emphasize on monitoring adaptive management to our submissions to NIRB. QIA looks forward to working with NIRB, the proponent, and other parties. We look forward to making adaptive management a cornerstone for the success of this project, should it proceed.*[5]

[5] O. Eegeesiak, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 482, lines 12-24.

It is however, important to note that the precautionary principle has been expressed in various forms and there is developing commentary that suggests a more stringent version of the precautionary principle than that cited by the NIRB in the past may be warranted in certain circumstances. The focus of the version of the principle cited by the NIRB in previous decisions prevents project proponents from using scientific uncertainty as a reason not to act, while the more rigorous version of the principle that is emerging focuses on compelling **positive** action where there is serious risk of environmental degradation and high levels of uncertainty by requiring monitoring for and mitigation of potential adverse effects before such impacts actually occur. In such cases, the precautionary approach incorporates a "safety margin" into monitoring and mitigation measures and the adaptive responses to potential adverse effects are designed to be proportional to the risk (i.e. the higher the risk of significant adverse impacts the more extensive the required monitoring and mitigation measures).

The practical effect of applying a more stringent version of the precautionary principle is that the adaptive management strategies chosen are required to be highly responsive to early warning signs that risks may materialize. Rather than waiting for impacts to be noted before mitigation measures are triggered, a more stringent approach requires that thresholds and triggers are set to require responses long before adverse impacts are likely. In order to determine the extent to which the NIRB should implement this heightened approach in this review, the Board has considered the following factors:

(i) the seriousness or reversibility of potential adverse impacts;

(ii) the likelihood that should the impacts occur they could be mitigated or reversed;

(iii) the jurisdictional authority of the NIRB; and

(iv) public concern.

On this basis, where not expressly stated otherwise in this report and recommendations, the Board has applied the version of the precautionary principle set out in the FEIS Guidelines. However, where, based on the Board's consideration of the four factors outlined in the paragraph above, the Board has found it necessary to apply a more stringent approach to the precautionary principle and adaptive management, in order to maintain the ecosystemic integrity of the Nunavut Settlement Area, the Board has provided a brief summary statement regarding its analysis and rationale supporting the adoption of the more stringent approach.

1.6.3 Inuit Qaujimaningit

As indicated in both the EIS Guidelines and the Board's previous decisions, in the Board's view, Inuit Qaujimaningit (IQ), which encompasses Inuit Traditional Knowledge (TK) (and variations thereof) as well as contemporary Inuit knowledge that reflects Inuit societal values and experience, contributes vital information to the NIRB's review process. The term Inuit Qaujimaningit is meant to encompass local and community-based knowledge, ecological knowledge (both traditional and contemporary), which is rooted in the daily life of Inuit people and represents experience acquired over thousands of years of direct human contact with the environment.[6] With its emphasis on personal observation, collective

[6] Berkes, F. 1993. Traditional ecological knowledge in perspective. In: Inglis, J. (ed.), Traditional Ecological Knowledge: Concepts and Cases. Ottawa: Canadian Museum of Nature, pp. 1-9.

experience and oral transmission over many generations, Inuit Qaujimaningit provides factual information on such matters as ecosystem function, social and economic well-being, and explanations of these facts and casual relations among them. In this regard, Inuit Qaujimaningit has played a significant role in this Review by: contributing to the development of accurate baseline information; comparing predictions of effects with past experience; and assisting in the assessment of the magnitude of projected effects.

The Proponent was required to incorporate Inuit Qaujimaningit into the Environmental Impact Statement (EIS), to the extent that the Proponent had access to such information and in keeping with the expectation that the Proponent would undertake appropriate due diligence to gain access to the information but may be limited by obligations of confidentiality and other ethical obligations that may attach to such information. In addition to Inuit Qaujimaningit provided as part of the EIS or in questions or responses provided by the intervenors, during the approximately six days of Community Roundtables at the Final Hearing, Elders, Inuit harvesters and other community members freely shared their extensive Inuit Qaujimaningit with the Board.[7] The NIRB has benefitted immensely from the Inuit Qaujimaningit provided in the EIS and shared with us by the participants at the Final Hearing and the Board has considered and incorporated this information throughout the report and recommendations.

1.7 Scope of NIRB's Assessment and Environmental Impact Statement Guidelines

On the basis of comments received and the NIRB's screening of the Project Proposal, when the Board issued its screening decision report to the Minister of Indian Affairs and Northern Development Canada (as he then was) on June 27, 2008 the Board identified the following as issues that should be considered if the project proceeded to a review under Article 12, Part 5 of the NLCA:

- Works in and around water such as the construction of bridges, dams and culverts
- Impacts to wildlife, especially caribou, posed by the proposed Railway and existing tote road
- Impacts to marine mammals caused by shipping and potential spills along the proposed shipping routes from Milne Inlet though Eclipse Sound and from Steensby Inlet, via Foxe Basin to Hudson Strait
- Potential impacts to traditional land uses in the Ikpikituryuaq area
- Socio-economic impacts to communities in the region
- Potential impacts on surface water quality from the use of explosives; potential acid rock drainage and metal leaching from waste rock stockpiles; construction fills, embankment of roads, and other open quarry sites during both construction and operation of the project

[7] See for example NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, starting at p. 985, July 20, 2012, starting at p. 1123, July 24 (am), 2012, starting at p. 1734, July 25 (am), 2012, starting at p. 1826, July 25 (am), 2012, starting at p. 1900, July 27 (am), 2012, starting at p. 2464, July 28 (am), 2012, starting at p. 2583 and July 28 (am), 2012, starting at p. 2667.

- The effects of construction, closure, and post-closure activities relating to site runoff and road crossings on surface water quality of natural water bodies and adjacent areas
- The anticipated impacts of construction, operation, and closure activities on specific vegetation associations and geomorphologic structures
- The potential of cumulative impacts resulting from ongoing and incremental land use activities associated with mining, terrestrial transportation corridor creation, and marine shipping
- Potential impacts on marine water quality, in particular, the marine water quality in proximity to the sea port
- Potential impacts to air quality
- Potential impacts to wildlife resulting from human activities and habitat loss associated with mining activities
- Potential impacts to species at risk
- Disturbance to waterfowl and seabirds nesting in coastal areas along proposed shipping route
- Shoreline erosion as a result of wake effects along proposed shipping route
- Impacts resulting from accidents or malfunctions which may occur during mining operations, rail transportation, and marine shipping[8]

In the Minister's response of February 11, 2009 directing the Board to undertake a review of the Project Proposal under Article 12, Part 5 of the NLCA, the Minister also identified two additional issues for the Board to consider: the requirements for potential amendments to the North Baffin Regional Land Use Plan and joint NPC/NIRB review of the transportation corridor and consideration of the unprecedented rate of seasonal ice breaking and the potential for this activity to have effects on adjacent jurisdictions.

With these issues in mind, the NIRB prepared a preliminary scoping list for the Project and then conducted public scoping sessions in the eleven communities identified by the NIRB as potentially affected by the Project, Pond Inlet, Arctic Bay, Resolute, Grise Fiord, Igloolik, Hall Beach, Coral Harbour, Cape Dorset, Kimmirut, Clyde River and Iqaluit. As indicated in the Board's Public Scoping Meeting Summary Report, released on June 18 2009, the scoping process assisted the Board in identifying those components of the biophysical and/or socio-economic environment that may be impacted by the Project and/or for which there is public concern. On November 16, 2009, after due consideration of the issues identified in screening, the issues identified by the Minister and the comments received during the scoping process, and in accordance with section 12.5.2 of the NLCA, the NIRB provided the Proponent with the EIS Guidelines for the Project.[9]

While it is the sole responsibility of a Proponent subject to a NIRB review to prepare an EIS that includes sufficient baseline data and analysis for a complete assessment of the anticipated impacts of the Project, the purpose of the EIS Guidelines is to assist the Proponent and participants in the Review by identifying the information requirements and expectations for the EIS that will form the basis for the Board's

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[8] NIRB Screening Decision Report, NIRB FILE NO.: 08MN053, June 27, 2008 at pp. 5-6.

[9] See the "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.

review of the Project. If an EIS conforms to the EIS Guidelines it enables the Board and interested parties to understand and assess the potential adverse and beneficial biophysical environmental and socio-economic effects associated with development of the project.

On September 7, 2010 the Proponent advised the NIRB of its intention to include a new alternative means of carrying out the Project, the “Road Haulage Option” into the effects assessment in the Draft EIS and requested further guidance from the NIRB in order to ensure that the assessment of this proposed alternative met with the expectations of the NIRB and other reviewing parties. After soliciting comment and clarification with respect to the inclusion of the “Road Haulage Option” in the Draft EIS (DEIS), on November 10, 2010 the NIRB issued an Addendum to the November, 2009 EIS Guidelines to address the inclusion of the Road Haulage Option.

On February 15, 2011 the NIRB assessed the Proponent’s DEIS against the EIS Guidelines and found that the DEIS conformed to the EIS Guidelines and distributed the DEIS for review and comment. Following information requests, technical review and the Pre-Hearing Conference associated with the DEIS, further direction was provided to the Proponent regarding additional information required by the Board and the parties in the FEIS (FEIS) and the NIRB communicated these requirements in the Pre-hearing Conference Decision released on December 9, 2011.

On February 9, 2012 the NIRB indicated that the Proponent’s FEIS conformed to the requirements of the EIS Guidelines and the additional requirements identified in the Pre-hearing Conference Decision, and remitted the FEIS to the parties for review and comment.

On May 11, 2012 following technical meetings in Iqaluit on the FEIS, the Board provided the parties with further guidance regarding the key issues that the NIRB anticipated would likely warrant focused discussion at the Final Hearing (these issues are listed in Section 1.10 of this report that follows).

1.8 The NPC/NIRB Joint Review of the Transportation Corridor

Upon submission of the Mary River Project Proposal to the Nunavut Impact Review Board (NIRB), Nunavut Water Board (NWB) and Nunavut Planning Commission (NPC or Commission) in March 2008, Baffinland noted it required a positive conformity determination from the NPC with regards to the provisions of the North Baffin Regional Land Use Plan (NBRLUP). Further, Baffinland indicated its understanding that the portion of the proposed Railway line falling within the area covered by the NBRLUP[10] constituted a proposed “transportation corridor” requiring an amendment to the NBRLUP in order to proceed.

On April 30, 2008 the NIRB received a positive conformity determination from the Nunavut Planning Commission for the Project in relation to the NBRLUP. The conformity determination also outlined the provisions set forth in sections 3.5.11 and 3.5.12 of Appendix C of the NBRLUP, regarding the requirement for a joint public review by the NIRB and the NPC which would address the transportation corridor proposed by the Project.

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[10] Approximately 34 km of the proposed Railway routing lies within the area covered by the NBRLUP, FEIS Volume 2, Section 2.2.1, page 45.

Following receipt of the NPC's conformity determination for the Project the NIRB commenced Screening pursuant to Part 4 of Article 12 of the Nunavut Land Claims Agreement (NLCA). On May 2, 2008, the NIRB created an online public registry for the file and distributed a Notice of Screening for the Mary River Project Proposal to various Federal and Territorial agencies, Inuit Organizations, and those communities and organizations potentially affected by the proposed development. The Parties were asked to review the application and provide the NIRB with comments by May 23, 2008 regarding, among other things, "any concerns related to requirements of the NBRLUP, specifically regarding conformity requirement 3.5.12 (Appendix C of the NBRLUP) which requires that the NIRB and the NPC to publicly review the transportation corridor component of the project to address a potential amendment to the Plan".

On June 27, 2008 the NIRB issued a screening decision report to then-Minister of Indian and Northern Affairs Canada (INAC), the Honourable Chuck Strahl, (the Minister), recommending that the Mary River Project Proposal be subject to a review under Part 5 or 6 of Article 12 of the NLCA.

Within its Screening Decision Report, the NIRB noted that during the Screening process, a jurisdictional issue had been raised with respect to the NIRB's jurisdiction to screen the project notwithstanding the potential requirements to amend the NBRLUP. In their respective comment submissions to the NIRB, the Qikiqtani Inuit Association (QIA), INAC and to a lesser extent the Government of Nunavut, raised concerns about the NPC's exercise of its discretion in reaching a positive conformity determination in light of the transportation corridor requirements contained in the NBRLUP. However, as the NIRB does not have jurisdiction to address the land planning issues raised by these parties, and in light of the conformity determination by the NPC, the NIRB determined that it was required to move forward and screen the Project Proposal as required by Section 12.4.1 of the NLCA. Consequently, the NIRB proceeded to make its determination as to whether the Project Proposal had significant impact potential, and therefore whether it required review under Part 5 or Part 6 of the NLCA.

In addition to the Minister's decision on a referral to a Part 5 or 6 Review, within its Screening Decision Report the Board noted the concerns raised around the transportation corridor application associated with the project proposal and further sought the Minister's direction with respect to the NPC conformity determination and the outstanding requirements of the NBRLUP.

On July 29, 2008 Baffinland wrote to the Minister in response to the submissions of QIA, INAC and the GN and clearly stated their position that the conformity decision and suggested joint review of the Railway by the NPC and NIRB was entirely consistent with the provisions of the NLCA and the NBRLUP. Further, Baffinland indicated that the NIRB screening and/or review need not be suspended pending the NPC's amendment to the NBRLUP to allow for the transportation corridor, clearly indicating that it is appropriate for the proposed amendment to the NBRLUP to be dealt with in the context of a joint review process rather than be conducted solely as an amendment application in isolation and in advance of the review of the Project Proposal. Baffinland expressed the view that: "Dealing with the proposed corridor amendment in isolation will unnecessarily extend the regulatory process at great cost to Baffinland and the local communities" and noting that "There is no corresponding benefit that comes from this unwarranted procedural delay since the joint process will provide for the active and informed participation of Inuit and other residents affected by the proposed corridor."

On September 18, 2008 the Minister responded to Baffinland and indicated the following:

> As you have noted, in addition to seeking a determination pursuant to section 12.4.7 for the Mary River Project, the Board also took the opportunity to bring several issues to my attention. Specifically, the Board has indicated there is still "uncertainty around the North Baffin Regional Land Use Plan and the completion and sequencing of the land use planning process", and has asked for advice on the Nunavut Planning Commission's conformity determination given the outstanding requirements of the land use plan. I intend to carefully consider the issues raised by the Board in its correspondence and to seek the views of the other federal departments with jurisdictional responsibility in relation to the proposal before making my determination. It is my objective to do this as expeditiously as possible.

Pursuant to Section 12.4.7 of the NLCA, on February 11, 2009 the Minister referred the Project to the NIRB for a review of the ecosystemic and socio-economic impacts under Part 5 of Article 12 of the NLCA. Pursuant to Sections 12.5.1 and 12.5.4 of the NLCA, the Minister also requested the following:

> In order to limit the delays to the overall review of the Proposal, I would encourage the Board and the Commission to develop an arrangement that will satisfy the outstanding requirements of the land use planning process, while not unduly encumbering the Board's Part 5 review process. Once finalized, I would encourage the Commission and Board to communicate the agreed upon processes to all parties involved in the review.

Following the direction from the Minister, on March 16, 2009 the NIRB and NPC formalized an arrangement to ensure an efficient joint review process intended to satisfy both organizations' requirements for the review of the Mary River Project Proposal. A detailed description of the process to be followed for the NIRB's Review of the Project and the steps NPC/NIRB joint review was provided to all parties for information.

As was determined to be appropriate by the NPC and the NIRB, the information requirements set out in the NBRLUP for the review of a proposed transportation corridor (NBRLUP Appendices J and K) were included within the scope of the NIRB's Review and incorporated into the Board's EIS Guidelines for the Mary River Project Proposal. The NPC was to assist the NIRB in the conformity review of the Draft EIS with respect to the transportation corridor and related information requirements of the North Baffin Regional Land Use Plan, as included in the *Final* EIS Guidelines. It was recognized that, should it be determined that Baffinland's Draft Environmental Impact Statement (DEIS) conformed to the EIS Guidelines issued by the NIRB, the submission would also be permitted to serve as an application to amend the NBRLUP for the proposed transportation corridor.

On September 4, 2009 the NIRB, the NPC and the NWB, issued a revised process map and detailed description of the process to be followed for the NPC/NIRB joint review, and a revised Detailed Coordinated Process Framework describing the planned coordination between the NIRB and the NWB.

Following the NIRB's determination that Baffinland's DEIS submission conformed to the EIS Guidelines issued for the Project, the NIRB initiated a public technical review of the DEIS, inviting comments from all interested parties. Parties were advised that during the technical review period, the NIRB and the NPC would evaluate the information in the DEIS pertaining to Appendices J and K of the NBRLUP, and it was subsequently requested that parties provide their related analysis within their technical review comments. During public information sessions held by the NIRB throughout the Nunavut Settlement

Area, the Board also updated the public on the NPC/NIRB joint review process for Baffinland's NBRLUP amendment application.

October 12, 2011 NPC issued correspondence to NIRB to indicate that as the NPC was in the process of preparing a draft Nunavut Land Use Plan to replace the NBRLUP, which would address transportation corridors, the NPC would not be seeking an amendment to the NBRLUP. In response, Nunavut Tunngavik (NTI) sent a letter on October 25, 2011 to the NPC and the NIRB to request the NPC to reconsider its position, based on NTI's view that the amendment to the NBRLUP was a conformity requirement that could not be waived by the NPC based on the introduction of an overall Nunavut Land Use Plan. On October 31, 2011 Baffinland issued its response to the NPC's October 12 letter expressing concern that the NPC's approach was a significant deviation from the agreed upon process for joint/review and prospective NBRLUP amendment.

On November 5, 2011, the NPC responded independently to Baffinland's letter and to NTI's letter, affirming the NPC's commitment to participation in the NPC/NIRB joint review process of the transportation corridor in accordance with its terms but stating clearly that the NPC did not view the amendment to the NBRLUP as a conformity requirement but rather an action that is to be implemented independently of the NPC's conformity assessment and which did not change the NPC's original conformity assessment of April 30, 2008. In this correspondence, the NPC indicated that until such time as the NIRB issued a Project Certificate, the NPC would not be able to make a recommendation to the Minister regarding the amendment to the NBRLUP, because the precise alignment of the Railway and therefore location of the transportation corridor would not be sufficiently clear. NTI responded on November 9, 2011 in a letter to the NPC by reiterating its view that the amendment was a conformity requirement under the NBRLUP and questioning the extent to which the NIRB review could proceed without the NPC making a determination regarding the amendment to the NBRLUP.

In addition, throughout this time, technical review comments were being received from all the parties regarding the Draft EIS, including comments regarding the NBRLUP amendment application, and the NIRB forwarded all comments which were associated with the NBRLUP amendment application to the NPC for its information. Following the technical review period, the NPC attended a Community Roundtable and Pre-Hearing Conference (PHC) held by the NIRB in Pond Inlet to facilitate further discussions on technical matters related to the DEIS.

On December 9, 2011 the NIRB released a Pre-Hearing Conference Decision which contained an update on the NPC/NIRB joint review process, as well as a listing of additional information which would be required to form part of Baffinland's FEIS submission in order to satisfy Appendix J of the NBRLUP. Subsequently, following the submission of the FEIS, the NIRB's compliance review of the FEIS, the consideration of Information Requests (IRs) received from the parties and the Proponent's responses to IRs, on April 30, 2012 the Board advised the NPC that, in the NIRB's view, the information that could reasonably be expected to be provided in the NIRB's review process had been provided in support of Baffinland's application for a transportation corridor to meet with the specific requirements of Appendices J and K. The Board also noted that having provided the NIRB's views on the status of compliance with the requirements of Appendix K to be addressed under the joint review, the NIRB had reached the extent of its advice and expertise under the NPC/NIRB joint review process, and would, on that basis proceed to the next steps in the Review unless otherwise requested by the NPC or the Minister.

On May 17, 2012 the NPC issued correspondence to Baffinland, stating that the NPC had determined, as was consistent with the NIRB's advice, that adequate information had been provided by Baffinland and parties to meet the requirements of the NBRLUP's Appendix J & Appendix K requirements. On May 30, 2012 the NPC issued a letter to the NIRB confirming the NPC's determination that adequate information had been provided to meet the requirements of the NBRLUP's Appendices J & K and restating that the timing of NPC's decision regarding whether to request an amendment to the NBRLUP would follow the completion of the NIRB process, following the issuance of a NIRB Project Certificate if the Project Proposal is recommended to proceed by the NIRB and approved to proceed by the Minister.

At the Final Hearing, the NPC summarized the interplay and timing between the NIRB Review and the potential amendment to the NBRLUP triggered by the proposed Railway as follows:

> *In summary, the north Baffin regional land use plan does not contemplate that a land amendment be complete before the Nunavut Land Claims part 5 project review is finalized or before any permits, licences, or authorizations can be issued. Implementation of the Nunavut Land Claims Agreement 11.6.3, requires that the Commission provide a recommendation to the Minister of Aboriginal Affairs and Northern Development Canada and the Minister of Environment, Government of Nunavut. The recommendation must advise the ministers on whether their request for the plan amendment should be accepted or rejected in whole or in part. The recommendation of the Commission to accept or reject the plan amendment proposal in whole or in part has no effect on the Nunavut Impact Review Board Review or the issuance of permits, licence, or authorizations.*[11]

Further, at the Final Hearing the NPC also reiterated the timing and process for a potential amendment to the NBRLUP would be as follows:

> *The Commission concludes that any requests, whether to amend the north Baffin land use plan to include the new transportation corridor would not advance until the final location of the Railway is determined. The final decision on the location of the Railway will not be provided to the Commission until the minister accepts the Nunavut Impact Review Board final hearing report and a Nunavut Impact Review Board final certificate is issued*.[12]

1.9 The NIRB/NWB Detailed Co-ordinated Process Framework

Prior to submission of Baffinland's project proposal in 2008, the NIRB and the NWB had been considering opportunities for enhanced coordination between the NIRB's impact assessment process and the NWB's water licensing process, as envisioned by Nunavut Land Claims Agreement (NLCA) Sections 13.5.2 and 13.6.1:

[11] B. Aglukark, NPC, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 535, lines 9-24.
[12] B. Aglukark, NPC, NIRB Final Hearing File No.: 08MN053 Transcript, July 27, 2012, p. 536, lines 15-24.

13.5.2 Where the water application is referred for review under Article 12, the NWB and the review body shall coordinate their efforts to avoid unnecessary duplication in the review and processing of the application. Legislation may provide for joint hearings or authorize the NWB to forego public hearings on any water application where it has participated in a public review of the relevant water application pursuant to Article 12.

13.6.1 The NPC, NIRB and the NWB shall co-operate and co-ordinate their efforts in the review, screening and processing of water applications to ensure they are dealt with in a timely fashion.

Upon submission of the Mary River Project Proposal to the NIRB, the NPC and the NWB in March 2008, Baffinland expressed its support for enhanced coordination of the NPC, NIRB and NWB processes.

On May 2, 2008, the NIRB distributed the Mary River Project Proposal to various Federal and Territorial agencies, Inuit Organizations, and those communities and organizations potentially affected by the proposed development. The Parties were asked to review the application and provide the NIRB with comments by May 23, 2008 regarding, among other things, "any concerns regarding the suitability of a coordinated effort, as envisioned in Section 13.5.2 of the NLCA, between the NIRB and Nunavut Water Board (NWB) in the review and processing of this application".

On February 24, 2009 the NIRB and the Nunavut Water Board (NWB) released a *Draft Framework to Guide a Coordinated NIRB/NWB Process* (Detailed Coordinated Process Framework or DCPF). The objective of the Detailed Coordinated Process Framework was to demonstrate how the NIRB and the NWB would coordinate their efforts to avoid unnecessary duplication in the review and processing of Type A water licence applications for projects undergoing a NIRB Review, pursuant to Sections 13.5.2 and 13.6.1 of the NLCA. As requested by the Proponent, the Mary River Project Proposal was to be one of the first project proposals subject to this coordinated approach.

In March through May of 2009, the NWB participated with the NIRB in the scoping meetings for the Project, and subsequently contributed *Appendix C: Nunavut Water Board Information Requirements for Type A Water Licence Application* to the EIS Guidelines released in late September, 2009.

On September 4, 2009, in response to comments the NIRB, the NPC and the NWB, issued a revised process map and a revised Detailed Coordinated Process Framework describing the planned coordination between the NIRB and the NWB for the Mary River Project Proposal. The focus of the Detailed Coordinated Process Framework was on eliminating overlap and duplication of effort for not only the Boards, but also the Proponent, the reviewing parties and the public, but it did not involve joint hearings. Consequently, in this Review the coordinated process does not eliminate the normal public hearing process associated with Type A water licences conducted by the NWB.

Following receipt of the DEIS addendum, on July 5, 2011 the NIRB commenced a 60 day technical review period and scheduled a Technical Meeting and Pre-Hearing Conference (PHC). During the technical review period, the NWB conducted its concordance assessment to determine whether the Draft Type A Water Licence application within the DEIS addressed the NWB information requirements set out in Appendix C of the EIS Guidelines. On October 5, 2011 the NWB provided its technical review comments, focusing on the aspects of the DEIS aimed at fulfilling the Type A water licensing requirements, including the draft water licence application, environmental management plans and sections pertaining to water

use and waste disposal activities. Overall, the NWB indicated that there was a lack of and/or insufficient information contained in the DEIS and accompanying draft of the water licence application for the NWB to deem it complete, and the NWB provided direction to the Proponent as to the outstanding information requirements that needed to be included in the FEIS in order for the NWB to consider the water licence application to be complete.

On October 7, 2011, following the NIRB's receipt of technical review comment submissions from the other participants to the Review regarding Baffinland's DEIS, the NIRB forwarded copies of those comments specific to the Draft Type A Water Licence Application to the NWB, for its consideration. The NWB attended and provided technical advice to the NIRB during the Technical Meetings associated with the review of the DEIS in Iqaluit on October 18-20, 2011 and the Community Roundtables and Pre-hearing Conference (PHC) in Igloolik and Pond Inlet on November 6-7 and 9-10 respectively. As indicated in the update on the co-ordinated process provided in the NIRB's PHC decision issued in December, 2011, the NWB's conformity assessment of the DEIS indicated that the draft Type A water Licence application accompanying the DEIS was deficient, and identified, in Appendix 3 to the PHC Decision several additional information requirements that would need to be met in order for the application to be considered complete.

On February 29, 2012, the NIRB and NWB issued joint correspondence regarding the FEIS, in which the NWB noted that following an internal preliminary conformity review of the Type A Water Licence application and supporting information provided as an appendix to the FEIS, the application was considered to be materially complete and acceptable. On March 2, 2012 the NWB invited the parties to comment on the completeness of the Type A Water Licence Application. Following receipt of comments, on April 16, 2012 the NWB gave notice of the receipt of a complete Type A Water Licence Application, as required under s. 55(1) of the Nunavut Waters and Nunavut Surface Rights Tribunal Act,[13] and invited technical review comments on the Application to be received by June 22, 2012.

On April 25, 2012 the NIRB and the NWB released an updated version of the DCPF, noting that the document had been developed further since its 2009 release through its continued application to Baffinland Iron Mines Corporation's Mary River Project Proposal. During the Technical Meeting regarding the FEIS held in Iqaluit on May 1-3, 2012, the NWB attended by teleconference and provided comments and technical advice. As of June 22, 2012 the NWB had received comments on the Type A Water Licence Application from the Qikiqtani Inuit Association, Aboriginal Affairs and Northern Development Canada, the Department of Fisheries and Oceans, Environment Canada and Natural Resources Canada.

During the Final Hearing for the NIRB's Review of the Mary River Project Proposal, reflecting the DCPF, a NWB staff member acted as a Technical Advisor to the NIRB.

As indicated in the DCPF, if the Minister approves the Project and allows it to proceed, the next steps in the NWB process would be to proceed with the usual water licensing process, including hosting a technical meeting, pre-hearing conference to set the issues and timelines for a public hearing and then conducting a public hearing in respect of the Type A Water Licence Application.

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[13] Nunavut Waters and Nunavut Surface Rights Tribunal Act, S.C. 2002, c. 10.

1.10 Key Issues

On May 11, 2012, following technical meetings held in Iqaluit to prepare for the Final Hearing, the Board identified that in addition to particular issues raised by the submissions of the parties, the following key technical issues were likely to warrant focused discussion during the Final Hearing:

a) Alternatives analyses associated with proposed Railway routing, marine shipping route and proposed frequency, seasonal duration and potential need for periodic suspension of shipping activities;

b) Design considerations for construction and operation of a Railway under arctic conditions, including management plans for mitigation of potential impacts to caribou and terrestrial wildlife;

c) Potential impacts from proposed mining and quarrying activities, including dust dispersion from the transport and storage of waste rock and ore, and impacts to water quality from acid rock drainage;

d) Adequacy of proposed mitigation measures to protect archaeological resources and other heritage sites;

e) Potential for accidents and malfunctions associated with proposed marine transport and storage of bulk fuel, including overwintering of fuel vessels and emergency preparedness;

f) Adequacy of marine baseline information and proposed monitoring and adaptive management plans;

g) Management of ballast water, including regulatory role in oversight/enforcement, potential for introduction of invasive species, and potential cumulative impacts to marine water quality, habitat and food chain/web dynamics;

h) Potential impacts to marine mammals and Inuit harvesting, including movement through the marine environment, resulting from proposed year-round shipping and associated ice breaking, noise and wake effects;

i) Potential for transboundary impacts associated with proposed shipping activities;

j) Potential direct and indirect socio-economic impacts, including impacts to community demographics, capacity of current services to meet future needs, traditional land use and food security; and,

k) Other issues as raised by parties, intervenors and the public.

2. PROJECT SETTING AND DESCRIPTION[14]

[14] Unless otherwise stated, the Project Setting and Description is based on the information provided by the Proponent in the Project Proposal and Final Environmental Impact Statement (FEIS).

2.1 Project Setting

2.1.1 Site Features

The landforms and the iron ore deposits in the Mary River Project area are associated with widespread past and current glaciation on Baffin Island. The Mary River iron deposits are located within the Mary River Group, an assemblage of Late-Archean metasedimentary to metavolcanic rocks that have been folded and preserved in greenstone belts. The Mary River Group greenstone belts are present as fragmented remnants stretching from Bylot Island south to Eqe Bay, with a maximum thickness of 4,000 m. The high-grade iron ore at Deposits No. 1, 2, 3 and 4 were discovered in 1962, and these initial hematite-magnetite mineralized zones were mapped out within extensive belts of banded iron formation in the area over the next three years. As typified at Deposit No. 1, the high-grade iron formations are inter layered with thin bands of chlorite-actinolite schist, staurolite-garnet-mica schist and banded iron formation across their strike width, with the entire assemblage up to 400 m-thick. With an awareness of the potential significance of the deposits in the Mary River area, the Inuit of the North Baffin secured a mineral lease in the area, and this mining lease over the proposed mine site predated the establishment of Nunavut under the Nunavut Land Claims Agreement.[15]

Surface geology consists of locally abundant sediment deposits from glaciers and rivers. The Project Mine Site area is located in a major glaciofluvial outwash deposit in what appears to be a classic “U’ shaped valley. In addition to the glaciofluvial deposits, there appears to be some direct glacial deposition consisting of kames, moraines, and eskers in and around the southeastern portion of Sheardown Lake.

The dominant landforms and deposition features in the Milne Inlet area are typically of glacial activity, marine and mechanical forms in various degrees. Glacial activity is not overly apparent on the immediate site but is more pronounced in the higher elevations south of the site. Marine and mechanical features are most predominant with terraces and strand (beach) lines formed by marine action which have been cut by mechanical features, some of which may be attributed to permafrost. Wind appears to have been responsible for some drifting on the finer grained soils on the lower part of the site. Recently deposited colluvium is present on many of the slopes and side hills in the area. The action of surface water has produced numerous sharp gullies along water-ways. Marine clays were also noted at some locations at the site.

The topography of the Rail Alignment to Steensby Port is generally quite hilly, with the exception of the Ravn River area, which is relatively flat. Glaciated valleys are evident along a portion of the alignment. Surficial geology consists of several types of deposits including glacio-lacustrine sediments, alluvial sediments (alluvial deposits), end moraine till, and till veneers and blankets. Occasional outcrops of pre-Quaternary bedrock and sedimentary rock formations are also common along the southern section of the Rail Alignment.

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[15] Exhibits 16 and 17, NIRB Final Hearing File No.: 08MN053, July 17, 2012, Nunavut Tunngavik Inc., Intervenor Submission English and Inuktitut, slides 4-6.

Near surface bedrock is dominant in the Steensby Port area. Limited overburden is in the form of marine sediments and localized deposits of till. The majority of the overburden is located in depressions between the numerous bedrock outcrops and is typically overlain by a significant layer of wet organics and boulders.

The Mary River Project is located in a zone of continuous permafrost. The active layer through the Project area typically ranges from approximately 1 to 2m but may be greater in areas where there is loose, sandy soil at the edges of lakes or ponds and less in areas with significant layer of wet organics at surface. Unfrozen zones termed “taliks” can exist within areas of continuous permafrost below lakes, under major rivers or near the coast.

All streams with the possible exception of large rivers freeze solid in winter. Lakes provide the only overwintering habitat for the two fish species, land-locked arctic char and nine-spined stickleback. Lakes also provide spawning habitat for arctic char across the study areas. Many streams provide rearing and foraging habitat and potential protection from predators for juvenile arctic char. Most of the drainage basins that support arctic char either contain barriers preventing fish migrations from the rivers into the oceans, and/or are distant from the coast, and most populations in the five study areas are land-locked. Nearshore zones of larger lakes also provide rearing and foraging habitat and potential protection from predators for juvenile arctic char, foraging and, in some cases, spawning habitat for adult arctic char, and overwintering habitat for all life stages.

As is typical of Arctic ecosystems, the freshwater environment in the Project area is relatively nutrient-poor and primary productivity is relatively low. In general, Arctic freshwater ecosystems are characterized by relatively low diversity of zooplankton communities due to low temperatures and nutrients. The benthic invertebrate communities in the Mine Area are generally moderately diverse, although higher diversity is found in some small tributaries, and are dominated by chironomids (midges).

Plant life is relatively sparse in much of the Project area and is generally consistent with the plants that usually occur in arctic regions. Vegetation of the study areas are generally consistent with flora of Arctic regions; short plant heights growing on rocky, sandy or silt soils of low nutrient content.

While some populations of caribou migrate between preferred habitats in summer and winter, North Baffin caribou appear to be non-migratory and are likely to be found relatively equally in many locations throughout the Project area. Migratory bird species observed in the Mary River area include snow geese, ducks, eiders, loons, and mergansers. Raptors found include rough-legged hawks, peregrine falcons, gyrfalcons, and snowy owls.

The inland waters near the Project mainly contain landlocked arctic char, though sea-run char are present in a lake next to Steensby Port and up the Cockburn River system next to a portion of the Railway. Fish in the marine waters include arctic char, sculpin, and Atlantic lumpfish at Steensby Inlet, and arctic char, sculpin and Greenland cod at Milne Inlet.

The marine physical environment varies across the Project area. Milne Inlet is comprised of a fjord system having water depths reaching over 800m with depths commonly between 150 and 300 m. Closer to the proposed Milne Port location is a characteristic U-shaped cross-sectional profile common to fjords that has a maximum water depth of approximately 150 m. Phillips Creek and a smaller creek to the east discharge into the inlet and have formed a sand, fjord-head deltaic complex along the southern shore

with small estuaries. Hudson Strait is generally between 200 and 400 m in depth with depths north of Ungava Bay reaching 1,000 m. Foxe Basin is a broad shallow depression and is characterized by water depths commonly less than 100 m. Water depth was in excess of 40 m over most of the area surveyed in 2008. Southern Steensby Inlet is marked by two north-south longitudinal troughs reaching maximum depths of about 145 m, shoaling to a depth of 40-60 m near the proposed port area.

2.1.2 Biophysical Conditions

The North Baffin region containing the Mary River Project area lies within the Committee Belt, a granite-greenstone terrain mixed with sedimentary and volcanic rock. Occasional outcrops of granitic and sedimentary rock formations occur. The mountains to the east are older than 540 million years old, and the lowland plateaus to the west are about 250 to 540 million years old.

The climate is semi-arid and permafrost coverage is continuous extending to a depth of 500 metres, with an active layer of up to 2 metres. The extremely cold temperatures of the region, combined with the permafrost, result in a short period of runoff that typically occurs from June to September. All rivers and creeks, with the exception of the very largest systems, freeze completely during the winter months. Due to the combination of low temperatures and the low capacity of the soil to hold moisture, vegetation is minimal and surface water is abundant. The region is dotted with thousands of small lakes and streams.

The region experiences near 24-hour darkness with less than two hours of twilight from November to January. During the winter months, the treeless topography and fine powdery snow produce blowing snow conditions, resulting in restricted visibility. There is continuous daylight from May to August and frost-free conditions occur from late June to late August. The months of July and August usually experience the greatest precipitation. From September to November, temperature and the number of daylight hours decrease, and by mid-October the mean daily temperature is generally well below 0°C. The highest snowfall typically occurs during this period. Air quality is very good, as would be expected in a pristine environment, and noise levels are low in the Project area as is typical of a remote environment.

The coastal habitats of Milne Inlet and Steensby Inlet are typical of periglacial coastal environments where most of the shoreline is dominated by either rock or coarse sediment beaches comprised of poorly sorted boulder, cobble, pebble, and sand. Limited open-water seasons and the coarse nature of the shorelines results in complex, poorly organized shoreline morphology. The presence of sea ice limits the development of intertidal biota, although rockweed was commonly observed along the shore.

Streams within the Project area typically have naturally elevated concentrations of dissolved oxygen, turbidity, aluminum and iron. Some average values for pH exceeded the Canadian Council of Ministers of the Environment (CCME) guidelines as did average values for cadmium and mercury at most sites. Selenium routinely was reported at the CCME guideline. When all areas for stream sampling were compared based on Water Quality Index values, the sampling locations within the area between Camp Lake and Milne Port indicated the highest value of 99.5, or “excellent” water quality.

Lakes within the project area generally undergo vertical thermal stratification in late July and early August. In late August and early September the lakes undergo uniform mixing of the water column. Average values for pH exceed the CCME range of 6.5 to 8.5 for lakes within the Mine Site area (Mary

Lake, Camp Lake and Sheardown Lake). Cadmium and Mercury are at or above CCME guidelines in some lakes.

The streambeds are typically dominated by cobbles and boulders. Sediment quality at stream and lake sites across the project area were generally good with naturally higher levels of chromium, copper and, to a lesser extent, arsenic, cadmium, mercury, lead and zinc.

The water composition from Milne Inlet and Steensby Inlet reflect those typical of marine waters (e.g., chloride, sodium, sulphate, magnesium, etc.). Several metals (including cadmium and iron) are present in low concentrations and are generally below the analytical level of detection.

A total of 146 benthic infauna species were identified from Milne Inlet. *Polychaetes* and *ostracods* were the most abundant taxa in Milne Inlet, although copepods, amphipods and several species of bivalves were also common. As reported in previous studies of the Canadian Arctic, the abundance and community composition of benthic infauna in Milne Inlet varies with depth.

The nearshore marine fish community in the vicinity of the Milne Port is characterized by low species diversity and abundance. arctic char, fourhorn sculpin, shorthorn sculpin, Arctic staghorn sculpin, and Greenland cod were captured during the experimental gillnetting program, with sculpin species accounting for 80 % of the catch. Muscle samples collected from the arctic char catch contained an average mercury concentration below the Health Canada commercial export limit of 0.5 ug/g. Although few arctic char were captured at the Milne Port site, the nearby Tugaat and Robertson Rivers support anadromous (migratory) char populations.

In general, the marine fish community near the Steensby Port documented during Project specific studies was characterized by low species diversity and abundance. arctic char, fourhorn sculpin, shorthorn sculpin, and Atlantic lumpfish were captured during experimental gillnetting programs. arctic char were by far the most common species observed, comprising 90.6 % of the catch. The average concentration of mercury within muscle tissue samples collected from the arctic char catch was below the Health Canada commercial export limit of 0.5ug/g.

Terrestrial mammals in the region include barren-ground caribou of the North Baffin herd, wolf, arctic and red fox, ermine, arctic hare, and lemmings. Marine mammals are found in abundance in the region, including polar bears, narwhals, beluga whales, bowhead whales, several species of seals, and walrus. Killer whales and northern bottlenose whales were found in small numbers.

North Baffin caribou are currently present at low densities and their numbers seem to vary in accordance with a 60 to 70 year cycle. The last period of caribou abundance in the area was 1980 to 2000, and the previous period of low abundance was in the 1940s. Caribou are expected to remain at low numbers for the next couple of decades. However, there is evidence that caribou do occur throughout the entire region.

Relatively low densities of songbirds and shorebirds were recorded throughout the region. There are also numerous sea birds in the area of the shipping route including thick billed murres and many types of gulls. There are two fish species in the freshwater environment: arctic char and a minnow species named nine-spine stickleback.

In total twenty-two marine mammal species are known or expected to occur in the identified Regional Study Area (RSA) including the proposed shipping routes in Baffin Bay and Davis Strait. Species accounts are provided for all species; however, emphasis is placed on species which regularly occur within the RSA. Only one mysticete or baleen whale species, the bowhead whale (*Balaena mysticetus*), occurs regularly in the RSA. Narwhal (*Monodon monoceros*) and beluga (*Delphinapterus leucas*) are abundant in the RSA; other Odontocetes that occur (albeit in low numbers) in the RSA include killer whales (*Orcinus orca*) and northern bottlenose whales (*Hyperoodon ampullatus*). Pinniped species which occur regularly in the RSA include ringed seal (*Pusa hispida*), bearded seal (*Erignathus barbatus*), and walrus (*Odobenus rosmarus*). Polar bears (*Ursus maritimus*) also occur throughout the RSA.

2.1.3 Socioeconomic Conditions

The Baffin Region of Nunavut has a rich and visible archaeological heritage dating back many thousands of years. There are many archeological sites both small and more significant, particularly around Milne Port and Steensby Port but also along some sections of the proposed rail line.

The five North Baffin communities in the immediate vicinity of the Mary River Project are Arctic Bay (280 km), Clyde River (415 km), Hall Beach (192 km), Igloolik (155 km), and Pond Inlet (160 km). Each of these communities has long term social, economic and environmental ties to the Project area. For many of these North Baffin households, harvest of country food provides an important contribution to their overall well-being, both physical and cultural. In all five communities, caribou, ringed seal, and arctic char are of major importance. In addition, walrus is a significant species in Hall Beach and Igloolik, while narwhal is a key component of the harvest among households in Arctic Bay, Pond Inlet, and to a lesser degree, Clyde River.

The rate of subsidy that is effectively applied to country food harvests equates to between one-tenth to one-fifth of the subsidy rate applied to southern foods transported for sale in the North Baffin region. On this basis, harvesting from the land and sea is estimated to produce food worth between $12 million and $20 million per year in this region. The amount of work to harvest this food is estimated to be 350 full-time jobs.

The population of the North Baffin region are mostly Inuit (94 %), with non-Inuit accounting for just 6 %. The proportion of Inuit and non-Inuit in Iqaluit differs markedly, with 60 % of the population being Inuit and 40 % non-Inuit. While the Inuit population has a very young age profile, nearly all non-Inuit residents in North Baffin are of working age. In Iqaluit, 58 % of the population - 66 % of the male population - age 40 to 64 are non-Inuit. Non-Inuit men make up the majority of Iqaluit's male population aged 25 to 39. The demographic data suggest non-Inuit residents move to the communities primarily to work and that relatively few are raising families or living out their retirement years in these communities.

The Inuktitut language is prevalent in North Baffin communities. Nearly all Inuit residents of the North Baffin learn this language as their mother tongue, and for 9-in-10 residents, Inuktitut is the language most commonly spoken at home. A portion of the population, ranging from 6 % in Hall Beach to 24 % in Igloolik, consists of unilingual Inuktitut speakers. In North Baffin, nearly 2-in-3 Inuit work in settings where Inuktitut is the prevalent language.

The linguistic picture in Iqaluit is dramatically different from that of North Baffin. In the capital, slightly more than one-fifth of the Inuit population did not learn Inuktitut as their mother tongue and fewer than half speak Inuktitut at home. Only 20 % of Inuit in Iqaluit speak Inuktitut in the workplace, and only 3 % are unilingual Inuktitut speakers.

In addition to the $12-20 million in-kind income generated for North Baffin households through harvest activities in the land-based economy, residents gain monetary income through employment and various social transfers. In 2007, personal income reported by residents of the five North Baffin communities was $83 million, and income reported by Iqaluit residents was $196 million. Among the resident Inuit population, earned income accounts for between 70 % (Clyde River) and 81 % (Pond Inlet) of total income. Most of the remaining income, ranging from 17 % (Pond Inlet) to 27 % (Clyde River) is derived from government transfers. Other income, such as that from investments, accounts for less than 3 % of total income. In Iqaluit, the role of government transfers is much lower than in North Baffin communities, accounting for only 8 % of the total income of the Inuit population of the city.

The public sector accounts for a large portion of Nunavut's economic activity, and jobs in administration, education and health account for about half of all employment earnings in the territory. Public administration accounted for $271 million, or 24 %, of the territory's total $1.1 billion GDP in 2008. Education and health expenditures account for another $202 million. Combined, these public expenditures account for more than 40 % of the territory's GDP.

Nunavut's mining sector is once again expanding following closure, in the previous decade, of the Nanisivik and Polaris mines in the North Baffin region and the Lupin and Jericho mines in the Kitikmeot region. The Meadowbank Mine outside the study area in the Kivalliq region is expected to begin contributing over $90 million to Nunavut's GDP. Medium-term prospects for expansion in the sector include Newmont's Hope Bay development in Kitikmeot and AREVA Resources' Kiggavik project in the Kivalliq region. The Mary River Project is the most advanced project In the Baffin region.

The construction industry in Nunavut is driven by a combination of government-funded infrastructure projects and major private sector developments such as the Meadowbank Mine Project. Territorial government planned capital expenditures for the North Baffin total $32.3 million for the planning period 2010-11 to 2014-15, with another $33 million planned for Iqaluit. Across the territory, $381.6 million in capital expenditures is envisioned over this period.

The transportation sector provides a critical link between Nunavummiut in small communities to the specialized medical and educational services available only in larger centres. For the 2010/2011 fiscal year, for example, the territorial government has budgeted $47.9 million for medical travel, an expenditure item that has increased at a rate of 6.9 % year-over-year, from a level of $32.6 million in 2005-06. Goods imported into Nunavut by air and marine transport totalled $900 million in 2008, and the Iqaluit airport was among the top 20 busiest airports in Canada, based on number of flights. In spite of the tremendous importance of air and marine transport, the sector is largely based outside the territory and transportation contributes less than $21 million to the territorial GDP.

Infrastructure gaps are frequently suggested as important barriers to business, social, and cultural development in communities across the region. Hamlet Community Economic Development Plans call for many types of infrastructure: space for small businesses, workshop space for carvers, visitor centres, fish plants, swimming pools, day cares, youth centres, healing centres.

Nunavut has a small commercial fishery based on turbot and shrimp fished offshore primarily in Baffin Bay and Davis Strait. In addition to the offshore fishery, commercial arctic char production is carried out at plants in Pangnirtung, Iqaluit, Rankin Inlet, and Cambridge Bay. Although the economic value is modest, the quality of this product is high and potential for value-added processing and marketing, including supplying the local Nunavut market where high retail food prices are the norm, continues to be realized. A modest commercial caribou and musk ox harvest is also carried out, the former predominantly from Coral Harbour and the latter from Cambridge Bay. As with the char fishery, these products represent high-value specialties that sell for premium prices.

Most visitors to Nunavut come to the territory for work. Business travelers account for approximately three-quarters of all Nunavut visitors. Between 3,000 and 6,000 visitors come each year for non-work purposes and this component spends $6 to $12 million annually. An amount of $500,000 is estimated to be allocated each year across the North Baffin to tourism activities outside business travel and sport-hunting. In addition to spending by tourists who come to visit friends and family living in the north, these expenditures also include those of cruise ship visitors ($15,000 in one community), visitors to the national park, and adventure tourists.

The current amount of work opportunity generated by the wage economies of the study area amounts to the equivalent of 3,700 to 3,900 full-time, year-round jobs, of which 1,100 are located in North Baffin and 2,600 to 2,800 in Iqaluit. This equates to approximately 2 million hours of work in the North Baffin labour market each year, and 4.7 million hours of work in the Iqaluit labour market.

Most North Baffin region residents reporting self-employment income earned less than $5,000 through their business activities. In Iqaluit, self-employment earnings are a little higher, with half of self-employment income earners reporting more than $5,000, and 1-in-5 reporting $35,000 or more. Of the self-employment income earners in Iqaluit, 1-in-4 had family incomes with no other source of market income. Most people who report self-employment income however, live in families where a wage income is also earned. This other income can be substantial.

In Iqaluit in 2004, 100 of the 240 self-employment income earners, or 42 %, had family wage incomes of $85,000 or more. In the rest of the Baffin region, a similar proportion of self-employment earners (24 %) have no other family wage income. In these communities, however, the level of other family wage income is lower, with only 41 % of families having wage incomes of $35,000 or more, suggesting that employment income plays an important role as a spring-board to self-employment. While a few families rely on self-employment as their main source of income, it is more common that self-employment activities are nurtured by the wage employment earnings of either the self-employed person or a family member, or both. This pattern appears to be stronger in Iqaluit than it is in the other Baffin region communities.

Low baseline levels of literacy and numeracy present a major challenge to labour force development in the region and across Nunavut. In a report on adult learning in Nunavut, the largest group of adult learners in the territory are said to be at the lowest two levels of the four-level scale used in the International Adult Literacy and Skills Survey.

Early childhood education (pre-school) opportunities are not widely available across the study area. Before-school and after-school programs, which are important for parents working during the day, are absent in nearly all communities in the region, except for Clyde River, where an after-school program

has been in place since 2008. The level of service in Iqaluit is better, with full-day and part-day preschool programs and after-school programs available.

The number of high school graduates has been increasing in Iqaluit and across North Baffin over the past 20 years. In total, 390 North Baffin and 393 Iqaluit residents have graduated from high school since 1987. However, while Grade 12 enrolment in Iqaluit and Pond Inlet has increased in recent years, it has declined elsewhere in the North Baffin region.

While education levels are low across the study area, many residents of the Baffin region have been engaged in training and upgrading through the local college system and through various specialized programs. Arctic College, which has Adult Learning Centres in every community, reports that between 1,200 and 1,350 Nunavummiut enrol in full-time programs at the college. This equates to roughly one-quarter of the population between 20 and 29, or one-fifth of the 20-to-34 age group.

The Inuit of the North Baffin region have experienced tremendous social and cultural change over the course of a few decades. In particular, initiatives such as residential schools, have affected family integrity and by implication, social cohesion. Elders are becoming increasingly engaged in community life and in promoting the learning of traditional culture for the younger generation. At the same time, a shift toward western middle-class expectations appears to be taking place among Inuit youth. These communities have experienced dramatic population growth over the last 20 years. Over 70% of the population is under the age of 25. Underemployment and lack of opportunities are contributing to social stress.

Demand amongst residents for wage employment is very high. However, job opportunities in the North Baffin are limited. Inuit employment in North Baffin is characterized by many individuals earning small levels of income, well under what full-time work would pay, and a small number earning full-time, year-round incomes. Most residents working in full-time jobs in Iqaluit do so year-round. In North Baffin, many more full-time workers are engaged in these jobs for only short periods. Women who work full-time jobs in North Baffin are more likely to work year-round than are men.

Still, there are good-paying, full-time, year-round employment opportunities available. These are often in government and the "public sector" and require levels of education and kinds of experience that many residents do not have.

The number of jobs occupied by women has generally increased at a greater pace than those occupied by men. However, women in the region are working mostly in the public sector. The past public sector growth is not likely to continue and this suggests that as young women start to look for employment, they may need to find work in sectors not traditionally filled by women.

There are indications of an increasing net movement of Inuit from communities in the north to urban centres in the south. During the 10-year period between the 1996 and 2006 censuses, the Inuit population in regions outside traditional Inuit lands, or "Inuit Nunaat," increased 62 % from 6,795 to 11,000 individuals. In 2006, Inuit living outside Inuit Nunaat accounted for 21.8 % of the 50,480 Inuit living in all regions of Canada.

Approximately one-in-five jobs in North Baffin and in Iqaluit require a university education. One-quarter to one-third of jobs in the region require college or apprenticeship levels of training and skills. A similar

number require high school education and/or occupation-specific training. The remainder can be accessed by unskilled workers with on-the-job training.

The Government of Nunavut relies on federal transfer payments for at least 90% of its revenue. Government employment is a mainstay of the wage economy with many of Nunavut's small businesses and retail outlets established to support government needs, or those of public servants. Government jobs in administration, education, and health areas account for about half of all employment earnings in the territory. Construction employment has also been growing to support the development of government infrastructure.

Life expectancy at birth in Nunavut is 10 years shorter than it is for the Canadian population overall. From 1999 to 2001, life expectancy at birth in Nunavut was 68.7 years. Life expectancy at age 65 is similar among the male populations of Canada and Nunavut. However, while Canadian women age 65 can expect to live an additional 20.6 years, a Nunavut woman's average life expectancy at age 65 is only an additional 11.4 years.

In Nunavut, the birth rate is roughly twice that of Canada generally, while the incidence of pre-term delivery and low birth weight are both high relative to Canada overall. Although Nunavut's infant mortality rate has been improving, it is, however, much higher than in other regions of Canada.

Tobacco smoking rates are high in Nunavut and have an adverse effect on the health of residents. Alcohol abuse is also an issue that concerns many residents, health practitioners, social service providers and those involved in the justice system. As summarized at the Final Hearing:

> *…this territory has always had the highest Criminal Code work ratio, and it's always had the highest crime severity index of all the provinces and territories in the country.… Consistently since this place became its own territory, we have been number one. Last year we become number two in Criminal Code. Second only to the Northwest Territories by a very small margin. We seem to be at the top consistently year after year. Most apprised, one of the causal factors of that level is the level of alcohol that is abused in the territory.*[16]

In the Baffin Region, Iqaluit is the only "open" community, while Kimmirut, Pangnirtung, and Sanikiluaq are the only "dry" communities. The five communities of the North Baffin Local Study Area each have policies in place to restrict access to alcohol. Bootleg alcohol, however, is considered to be widely available at a high cost.

The rate of violent crime in Nunavut is the highest across Canada, varying from between six and eight times the national rate during the period 1999 to 2007. Within the Local Study Area, violent crime across North Baffin has been slightly over half the rate in Iqaluit.

A territorial breakdown of crime incidents provides insight into the nature of this violence. The rate of sexual assault across the territory reached a peak in 2003 at over ten times the national rate. While

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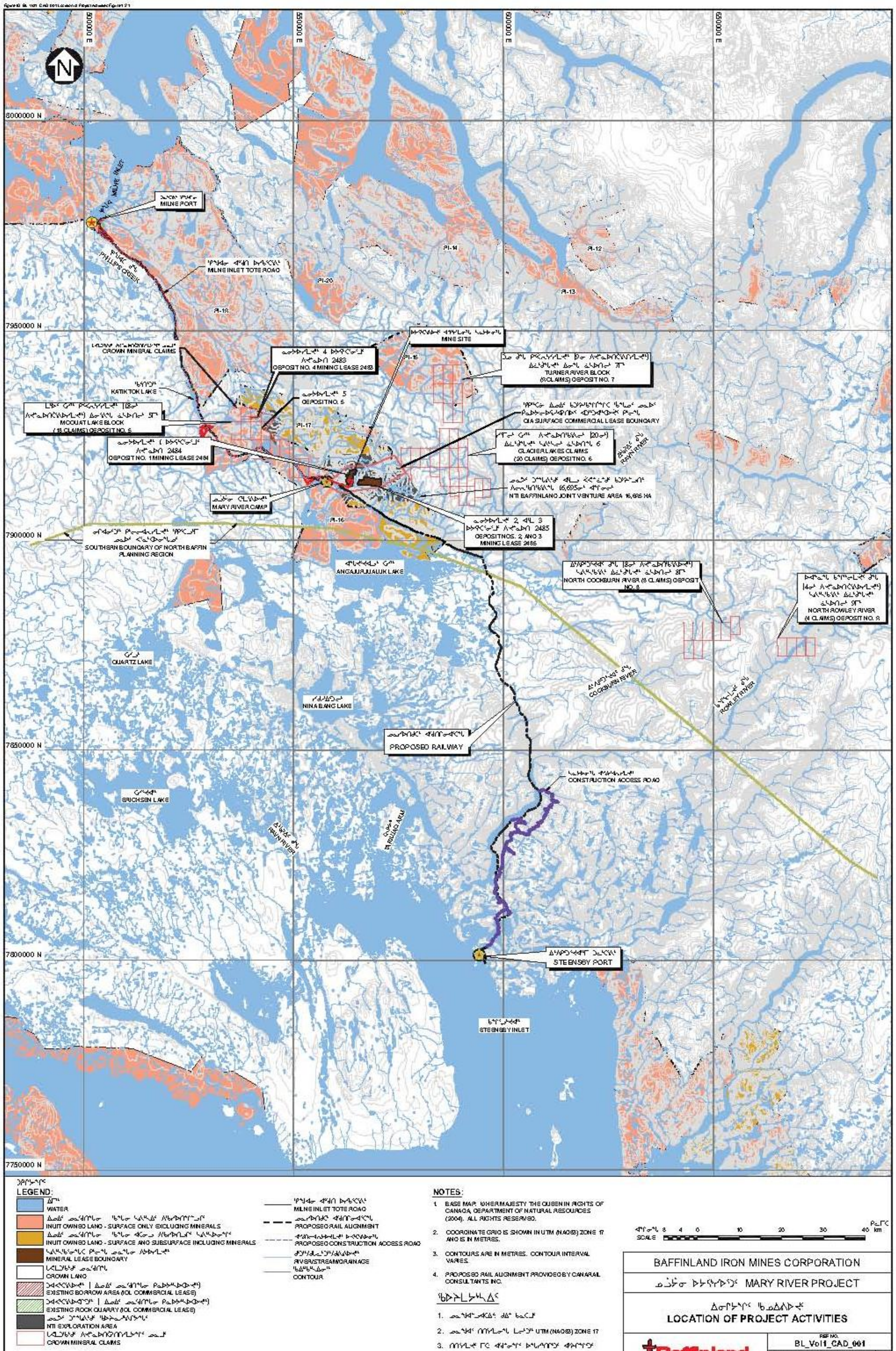
[16] Chief Superintendent S. McVarnock, RCMP, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1213, lines 2-13.

rates of sexual assault continued to be high into the later part of the decade, a decline has been noted, with the 2008 rate being the lowest of the ten-year period. Assaults with weapons and assaults causing bodily harm have increased consistently and dramatically over the decade.

2.1.4 Map of Project Activities

Figure 3: Location of Project Activities, FEIS Figure 1-2.1


MILNE PORT
MILNE INLET
PHILLIPS CREEK
MILNE INLET TOTE ROAD
CROWN MINERAL CLAIMS
KATIKTOK LAKE
MINE SITE
DEPOSIT NO. 4 MINING LEASE 2483
DEPOSIT NO. 5
TURNER RIVER BLOCK (5 CLAIMS) DEPOSIT NO. 7
MCOUAT LAKE BLOCK (18 CLAIMS) DEPOSIT NO. 6
QIA SURFACE COMMERCIAL LEASE BOUNDARY
DEPOSIT NO. 1 MINING LEASE 2484
GLACIER LAKES CLAIMS (20 CLAIMS) DEPOSIT NO. 6
MARY RIVER CAMP
NTI BAFFINLAND JOINT VENTURE AREA 16,696 HA
DEPOSIT NOS. 2 AND 3 MINING LEASE 2485
SOUTHERN BOUNDARY OF NORTH BAFFIN PLANNING REGION
ANGAJURJUALUK LAKE
NORTH COCKBURN RIVER (6 CLAIMS) DEPOSIT NO. 8
NORTH ROWLEY RIVER (4 CLAIMS) DEPOSIT NO. 9
QUARTZ LAKE
NINA BANG LAKE
COCKBURN RIVER
ROWLEY RIVER
PROPOSED RAILWAY
CONSTRUCTION ACCESS ROAD
ERICHSEN LAKE
STEENSBY PORT
STEENSBY INLET
6000000 N
7950000 N
7900000 N
7850000 N
7800000 N
7750000 N
LEGEND:
WATER
INUIT OWNED LAND - SURFACE ONLY EXCLUDING MINERALS
INUIT OWNED LAND - SURFACE AND SUBSURFACE INCLUDING MINERALS
MINERAL LEASE BOUNDARY
CROWN LAND
EXISTING BORROW AREA (IOL COMMERCIAL LEASE)
EXISTING ROCK QUARRY (IOL COMMERCIAL LEASE)
NTI EXPLORATION AREA
CROWN MINERAL CLAIMS
MILNE INLET TOTE ROAD
PROPOSED RAIL ALIGNMENT
PROPOSED CONSTRUCTION ACCESS ROAD
RIVER/STREAM/DRAINAGE
CONTOUR
NOTES:
1. BASE MAP: HER MAJESTY THE QUEEN IN RIGHTS OF CANADA, DEPARTMENT OF NATURAL RESOURCES (2004). ALL RIGHTS RESERVED.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL VARIES.
4. PROPOSED RAIL ALIGNMENT PROVIDED BY CANARAIL CONSULTANTS INC.
SCALE 8 4 0 10 20 30 40 km
BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT
LOCATION OF PROJECT ACTIVITIES
Baffinland Iron Mines Corporation
REF NO. BL_Vol1_CAD_001
FIGURE 1-2.1
REV 0

2.2 Project Description

The Mary River Project (the Project) consists of mining iron ore from the reserve at Deposit No. 1 at a production rate of 18 Million tons per year (Mt/a). The Project includes the extended exploration, construction, operation, closure, and reclamation of an open-pit mine and associated infrastructure for extraction, transportation and shipment of iron ore. There are 3 main project locations – the mine site, Milne Port north of the mine site, and Steensby Port south of the mine site. Milne Port is connected to the mine site by the Milne Inlet Tote road, approximately 100 kilometers (km) in length. A Railway of approximately 150 kilometers (km) will be constructed to connect the Mine Site to Steensby Port. For the construction period, supplies and equipment required for construction at the Mine Site and the northern portion of the Railway will be received through Milne Port. Likewise, construction equipment and supplies for Steensby Port and the southern portion of the Railway will be received at Steensby Port.

It is expected that Steensby Port facilities and the Railway will take up to four years to construct. During construction, supplies will be brought to both Milne Port and Steensby Port during the open water season. Once the Railway is operational, 18 Mt/a of iron ore will be transported by Railway and shipped from Steensby Port. Shipping of iron ore will occur year round and will require vessels with icebreaking capabilities. When Steensby Port is operational, Milne Port will only be used occasionally for the delivery of oversized equipment for the Mine Site. The main destination for the iron ore is European steel makers.

2.2.1 Need for the Project

As described by Baffinland in the FEIS, Vol. 3, Section 1.3, at p. 9, the Project is necessary on five bases:

- to provide a return on investment to Baffinland's shareholders;
- to supply high quality iron ore to potentially expanding international markets
- to support Nunavut's broad land use planning principles, policies and goals;
- to contribute to the development of infrastructure, skills training, employment, and business opportunities in Nunavut, consistent with the Government of Nunavut's Mining Policy;[17] and
- to contribute to Canada's northern strategy to strengthen Canada's sovereignty, protect the country's environmental heritage, promote economic and social development and improve Northern governance.[18]

2.2.2 Project Components and Phases

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[17] NIRB Final Hearing File No.: 08MN053, Exhibit 55: Government of Nunavut Mining policy "Parnautit: A foundation for the future", filed by Baffinland, July 26, 2012.

[18] Minister of Indian Affairs and Northern Development and Federal Interlocutor for Metis and Non-Status Indians. 2009. Canada's Northern Strategy: Our North, Our Heritage, Our Future. Ottawa: Minister of Public Works and Government Services Canada.

The proposed major project components and associated project activities include:

1) Iron ore mine at Mary River.
2) Railway transportation of iron ore from Mary River mine site to Steensby Inlet all-season sea port.
3) Open water shipping into Milne Inlet, through Eclipse Sound and Pond Inlet, via Baffin Bay and Davis Strait from southern Canada.
4) Transportation of supplies and materials from Milne Inlet via the Milne Inlet Tote Road to Mary River.
5) Operation of all-season sea port at Steensby Inlet.
6) Year round shipping (including ice breaking) at Steensby Inlet sea port through Foxe Basin and Hudson Strait to southern Canada and Europe.
7) Air transportation.
8) Ongoing geotechnical exploration.

As outlined in the FEIS, Vol. 3, Section 1.2, the Project will involve the following three major phases:

1) **Construction phase**: Anticipated to be approximately 4 years
2) **Operation phase:** Anticipated to be 21 years, subject to additional exploration results
3) **Closure and reclamation phase:** Closure phase expected to be 3 years, followed by a minimum of 5 years of post-closure environmental monitoring

In addition, throughout these project phases, Baffinland will continue to conduct ongoing geotechnical exploration in the area. Although the Project as assessed involves only the development of the ore reserve known as "Deposit No. 1", this is only one of nine known iron ore deposits located within the area and associated with mineral claims and leases held by Baffinland. As noted by Baffinland, while Deposit No. 1 is developed, Baffinland will continue its exploration efforts at the other deposits. On this basis, although the Project is based on production of 18 mt/a from Deposit No. 1, the nominal capacity of mine infrastructure will be 30 mt/a so production from Deposits No. 2 and 3 could be accommodated with only minor expansion to the existing mine infrastructure. As noted by Baffinland, however, although mining of Deposits No. 2 and 3 may not require significant additions to mine infrastructure, the mining of any additional deposits in future will trigger the requirement for additional environmental assessment.

2.2.3 Construction and Operations

Construction of infrastructure is expected to take four years, and will start by utilizing existing infrastructure established to support exploration and bulk sampling programs, including camps, fuel storage, laydown areas and the Milne Inlet Tote Road, which has already undergone some upgrades and servicing. The Railway is necessary for shipment of iron ore to Steensby Port, and its construction is a critical element. To expedite its completion, concurrent construction of the Railway will occur at a number of locations; construction of the north end will be staged from Milne Port via the Mine Site, and Steensby Port will be the staging area for the south end.

In addition to those at Milne Port, construction camps will be established at the Mine Site, Steensby Port, and up to four locations along the Railway. Infrastructure such as laydown areas, aggregate sources from rock quarries, and sand and gravel borrow areas will support construction. Temporary construction freight docks will be installed at Milne and Steensby Ports for landing equipment and materials during construction. A permanent freight dock and an ore dock will be constructed at Steensby Port. Where possible, permanent infrastructure needed for construction and operation will be built at the onset of construction. Temporary infrastructure needed during construction will be removed once construction is complete.

Large quantities of aggregate will be required for construction activities. Aggregate, including crushed rock from quarries as well as sand and gravel from borrow sources, will be required for construction of Project components, mainly for Railway construction. A number of existing and potential aggregate sources have been identified, mainly along the transportation corridors. Several existing rock quarry and borrow sites located on Inuit-owned land between Milne Port and the Mine Site are permitted under Baffinland's current commercial lease with the Qikiqtani Inuit Association (QIA) Extracted material will be used for ongoing maintenance of the Tote Road. Aggregate sources identified for construction of the Railway include 63 rock quarries located along the alignment. While only a small portion of the identified quarries and borrow areas will be used for the construction of an access road to facilitate Railway bed construction, most of the rock quarries will be required for building the Railway embankment.

The planned operating life of the Project is 21 years. Conventional open-pit mining techniques will be used, consisting of drill, blast and excavation of ore, followed by transport to crushing and screening facilities. Ore will be subjected to primary and secondary crushing and stockpiled at the Mine Site. Loading facilities will reclaim the ore from the Mine Site stockpiles and load the rail cars hauling to Steensby Port. Additional stockpiles are located at Steensby Port along with ship-loading facilities.

Locomotives pulling ore cars will be used to deliver iron ore from the Mine Site to Steensby Port and transport supplies on return trips. Steensby Port will include rail loading and unloading facilities and rail service/maintenance facilities; worker accommodations; ore loading, freight and tug docks; ore stockpile and ship loading and unloading facilities, and an airstrip. A dedicated fleet of about ten icebreaking ore carriers will transport most of the ore to international markets year round. Additional shipping will occur during the open water season.

Annual re-supply for mine operations will be shipped during open water to Steensby Port, with Railway transport of the supplies to the Mine Site. Open water shipping of replacement equipment to Milne Port will be carried out every few years and subsequent truck transport over the Milne Inlet Tote Road to the Mine Site own to oversized equipment too large to be transported through the tunnels along Railway through Steensby Port.

Once operations begin, decommissioning of temporary construction infrastructure will take place, as construction camps, equipment and related infrastructure are removed and taken off-site. At the same time, geotechnical and geophysical survey programs will continue, and successful exploration results could extend the operational life and/or increase the annual ore production volume.

2.2.4 Decommissioning and Reclamation

Baffinland has developed a preliminary Mine Closure and Reclamation Plan in accordance with all applicable requirements. This Preliminary Mine Closure and Reclamation Plan addresses all Project-related activity areas and infrastructure related to the Mary River Project and provides a cost estimate for the final mine closure.

Three abandonment scenarios have been described in this Preliminary Mine Closure and Reclamation Plan: short-term temporary mine closure, long-term temporary mine closure and final mine closure. Additionally, progressive reclamation measures have been proposed to facilitate temporary and final mine closures.

Short-term temporary closure is the planned shutdown of a mine site for a period of less than one year. All facilities would be secured, an inventory of all hydrocarbon products, chemicals, hazardous wastes and explosives would be carried out and all effluents would be monitored. Hazardous waste and explosives would be removed from the site. Personnel necessary, including environmental personnel, to meet closure criteria would remain on site.

Long-Term Closure is the state of inactivity resulting from economic considerations or a reduction in ore reserves for a period greater than one year. During Long-Term Closure the Project sites will be maintained in a secure condition. Site personnel will conduct general inspections periodically. Although protective measures will be in place, the Project will no longer be monitored by on site personnel maintaining a full time presence on the Project.

Final closure and reclamation will occur when the ore deposit is exhausted and the mine ceases operations without the intent to resume mining activities in the future. Final closure and reclamation will include removing all infrastructures, equipment and materials either off-site or into an on-site landfill, the Mine Pit or quarries (for inert, non-hazardous, non-combustible materials), contouring ground surfaces as required to maintain stability and to mimic the natural surrounding topography and re-establishing natural drainage patterns. Arrangements will be made with a sealift contractor to collect materials and equipment at Milne Inlet and Steensby Inlet and ship material destined for offsite transport. The airstrips will be abandoned, but left in good working order unless otherwise directed by regulatory agencies, to provide emergency/rescue landing spots for regional aircraft and access for post closure monitoring.

The final closure and reclamation activities are expected to last a period of three (3) years. Post closure monitoring will continue until closure objectives have been achieved as shown by monitoring results. These activities are periodic. Monitoring and follow-up inspections will be conducted to assess the physical and chemical stability of various components after closure and reclamation of the facilities. Environmental monitoring and follow-up inspections will assess the ongoing effectiveness of the reclamation.

3. INVOLVEMENT OF INTERESTED PARTIES

3.1 Consultation Opportunities

3.1.1 Public Consultation

Public participation is a central objective of the NIRB review process. Meaningful public participation requires the Review to address concerns of the general public regarding the anticipated or potential environmental effects of the project. Another objective of the NIRB review process is to involve potentially affected Nunavummiut to address concerns regarding any changes that the Project may cause in the environment and the resulting effects of any such changes on the traditional and current use of land/ice and resources. The Proponent must ensure that Nunavummiut have the information they require regarding the Project and its potential impacts. In this regard, Baffinland's specific consultation efforts are summarized in the FEIS, Vol. 2, Section 1.5.

The consultation efforts and opportunities for Nunavummiut to provide their comments to the NIRB during the screening and review process are outlined in Figure 3 that follows.

For anyone wanting to see listings of the attendees at any of the public meetings associated with this Project, including the Final Hearing, parties can review the sign in sheets associated with these meetings, as it is the NIRB's practice to ask all participants to sign in at the beginning of each day of proceedings; a full listing of sign in sheets from the Final Hearing is available online from the NIRB's public registry: http://ftp.nirb.ca

Figure 4: Public consultation efforts and opportunities

Screening Step	Party	Timeline DD/MM/YY	Type of Engagement	Notes/Issues
1 Screening	Project Specific Distribution List	02/05/08	Notice of NIRB Screening with public comment form attached and NIRB request for public comment by 23/05/08	*Distribution list includes HTOs, Hamlet offices of 11 communities in Nunavut, relevant Federal and Territorial Agencies, Inuit Organizations, interested parties and organizations in the Nunavik Region of Northern Quebec (Makivik Corporation, Kativik Environmental Quality Commission, etc.) and Labrador*
	Party: GN	22/05/08	Request for extension to public comment period	*NIRB grants GN extension request to 04/06/08*
	Public/Parties/ Intervenors	04/06/08	Comments on Project Proposal provided to NIRB	*Comments from: NTI, QIA, Hamlets of Arctic Bay, Pond Inlet & Igloolik, HTO Igloolik, Israel Mablik of Pond Inlet, DFO, EC, GN, INAC, NRCan and TC*
	Minister (INAC)	11/02/09	Minister refers project to NIRB for review	

Review Step	Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
1 Community Scoping	Project Specific Distribution List	13/03/09	Invitation to submit coments on *Draft* Scope of Project Proposal before 09/04/09	
	Public/Parties/ Intervenors	09/04/09	Comments on *Draft* Scope of Project Proposal	*Comments from: BIMC, QIA, Makivik Corp., Manitoba Densuline, GN, CTA, DFO, EC, INAC, NRCan and PC*
	Public/ Community Members	28/03/09 - 10/05/09	Participation in public scoping meetings and open houses--summary of concerns and issues in NIRB Scoping Meeting Summary Report released on 18/06/09	*Meetings held in Arctic Bay, Cape Dorset, Clyde River, Coral Harbour, Grise Fiord, Hall Beach, Igloolik, Iqaluit, Kimmirut, Pond Inlet and Resolute*
2 Guidelines Development	Project Specific Distribution List	24/06/09	*Draft* Environmental Impact Statement (EIS) Guidelines released for public comment with a deadline of 23/07/09	*Draft EIS Guidelines incorporate input from public scoping sessions*
	Party: QIA	02/07/09	Request for extension to public comment period	*NIRB grants QIA extension request to comment period to 04/08/09*
	Public/Parties/ Intervenors	04/08/09	Comments on *Draft* EIS Guidelines	*Comments from: BIMC, QIA, GN, DFO, EC, INAC, NRCan and TC*

Abbreviations for parties: Baffinland Iron Mines Corp. (BIMC), Canadian Coast Guard (CCG), Canadian Transportation Agency (CTA), Department of Fisheries and Oceans Canada (DFO), Environment Canada (EC), Government of Nunavut (GN), Hunters and Trappers Organization (HTO), Indian and Northern Affairs Canada (INAC), Natural Resources Canada (NRCan), Nunavut Tunngavik Incorporated (NTI), Parks Canada (PC), Qikiqtani Inuit Association (QIA) and Transport Canada (TC)

Review Step	Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
	Project Specific Distribution List	04/09/09	*Revised Draft* EIS Guidelines released for public comment deadline of 21/09/09	
	Public/ Community Members	14-20/09/09	Participation in public scoping meetings and open houses in Nunavik Communities	*Public scoping sessions in Akulivik, Inukjuak, Ivujivik, Kangiqsujuaq, Puirnituq, Quaqtaq and Salluit (Nunavik)*
	Public/Parties/ Intervenors	21/09/09	Comments on *Revised Draft* EIS Guidelines	*After comments received the NIRB extends time for parties to add clarification until 09/10/2009*
	Public/Parties/ Intevenors	29/09/09 - 30/09/09	EIS Guidelines Development Workshop	*Workshop held in Iqaluit, parties: BIMC, NWB, NTI, QIA, KIA, Municipal Councillor from Kimmirut, Representative from Pond Inlet, GN, DFO, INAC, NPMO, NRCan and TC*
	Public/Parties/ Intevenors	09/10/09	Comments and clarifications on *Revised Draft* EIS Guidelines	*Comments provided by: BIMC, NTI, QIA, KIA, GN, CTA, DFO, EC, INAC, NRCan and TC*
	Project Specific Distribution List	16/11/09	Final EIS Guidelines issued for the Project	*Scope and EIS Guidelines provide basis for the Proponent's preparation of the DEIS*
	Proponent	07/09/10	Advises that BIMC wishes to add Road Haulage Option to effects assessment into the DEIS	*BIMC requests additional guidance regarding assessment requirements for this option*
	Project Specific Distribution List	10/09/10	Comments invited on the Road Haulage Option with deadline of 01/10/10	
	Party: GN	14/09/10	Request for extension to public comment period	*NIRB grants GN extension request to 14/10/10*
	Public/Parties/ Intevenors	14/10/10	Comments and clarifications on *Revised Draft* EIS Guidelines	*Comments provided by: NPC, QIA, Pond Inlet, CLARC, Israel Mablick, Titus Arnakallek, DFO, EC, GN, NRCan and PC*
	Project Specific Distribution List	24/11/10	Addendum to EIS Guidelines issued to Proponent	*Issued at Proponent's request, for "Road Haulage Option" alternative*

Abbreviations for parties: Baffinland Iron Mines Corp. (BIMC), Pond Inlet Community Lands and Resources Committee (CLARC), Canadian Transportation Agency (CTA), Department of Fisheries and Oceans Canada (DFO), Environment Canada (EC), Government of Nunavut (GN), Indian and Northern Affairs Canada (INAC), Kivalliq Inuit Association (KIA), Nunavut Planning Commission (NPC), Northern Projects Management Office (NPMO), Natural Resources Canada (NRCan), Nunavut Tunngavik Incorporated (NTI), Nunavut Water Board (NWB), Qikiqtani Inuit Association (QIA) and Transport Canada (TC)

Review Step	Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
3 Draft EIS (DEIS)	Proponent	21/01/11	Proponent develops and submits DEIS to NIRB	
4 Conformity Review of DEIS	Project Specific Distribution List	15/02/11	Notice that DEIS conforms to EIS Guidelines and request for Submission of Information Requests (IRs) by 17/03/11	*IRs request additional information from the Proponent and other parties prior to commencement of Technical Review of DEIS*
	Public/Parties/ Intervenors	17-21/03/11	Information Requests (IRs) on the DEIS provided by parties and members of the public	*IRs received from: QIA, Hamlet of Pond Inlet, Members of the Public, NMRIRB, CTA, DFO, EC, GN, HC, INAC, NRCan and PC*
5 Technical Review of DEIS	Proponent	05/07/11	Proponent develops response to IRs and submits to NIRB	*60-day Technical Review Period of DEIS commences with a deadline of 06/09/11*
	Party: QIA	21/07/11	Request for extension to technical review comment period	*NIRB grants extension from 06/09/11 to 05/10/11*
	Project Specific Distribution List and Communities	12/08/11	Notice of Technical Meeting in Iqaluit 18-20/10/11 and Pre-hearing Conference and Community Roundtables in Igloolik 06-07/11/11 and Pond Inlet 09-10/11/11	*Public notices posted throughout communities and notice provided on community radio and television*
	Public/Parties/ Intervenors	05/10/11	Technical Review comments on the DEIS received from parties	*Comments received from: QIA, the Hamlet of Igloolik, GN, CTA, DFO, EC, HC, NRCan, PC and TC*
	Proponent	14/10/11	Proponent submits response to technical review comments	
6 Technical Meeting	Public/Parties/ Intervenors	18-20/10/11	Technical Meeting (TM) held in Iqaluit	*Participants: BIMC, QIA, GN, CTA, DFO, EC, INAC, NRCan, PC and TC*
	Public/Parties/ Intervenors	24/10/11	Comments provided regarding Proponent's draft listing of commitments	*Comments provided by: QIA, GN, CTA, DFO, EC, INAC and TC*
	Proponent	04/11/11	Proponent submits finalized listing of commitments arising from TM to reflect parties' comments	

Abbreviations for parties: Baffinland Iron Mines Corp. (BIMC), Canadian Transportation Agency (CTA), Department of Fisheries and Oceans Canada (DFO), Environment Canada (EC), Government of Nunavut (GN), Health Canada (HC), Indian and Northern Affairs Canada and subsequently Aboriginal Affairs and Northern Development Canada (INAC), Nunavik Marine Region Impact Review Board (NMRIRB), Nunavut Planning Commission (NPC), Natural Resources Canada (NRCan), Nunavut Water Board (NWB), Parks Canada (PC), Qikiqtani Inuit Association (QIA) and Transport Canada (TC)

Review Step	Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
7 Pre-Hearing Conference	Public/Parties/ Intervenors	6-10/11/11	Community Members and Parties Participate at Community Roundtables and Pre-Hearing Conference (PHC) in Igloolik and Pond Inlet	*Participation includes up to 3 representatives from other 9 communities Arctic Bay, Cape Dorset, Clyde River, Coral Harbour, Grise Fiord, Hall Beach, Iqaluit, Kimmirut and Resolute*
	Project Specific Distribution List	09/12/11	Pre-Hearing Conference Decision Issued	*PHC Report includes direction to Proponent to address issues raised during TM, Community Roundtables and PHC in FEIS*
8 Final EIS (FEIS)	Proponent	14/02/12	Proponent submits Final EIS	
9 Compliance Review of FEIS	Project Specific Distribution List	29/02/12	Notice that FEIS generally complies with EIS Guidelines and PHC decision requirements and invites parties to supply IRs by 30/03/12	*90-day Technical Review Period commences*
10 Technical Review of FEIS	Public/Parties/ Intervenors	02/04/12	Information Requests (IRs) on the FEIS provided by parties	*IRs provided by: QIA, GN, CTA, DFO, EC, NRCan, and TC*
	Proponent	19/04/12	Proponent provides response to IRs	
	Public/Parties/ Intervenors	01-03/05/12	Parties participate (some by teleconference) in Technical Meeting in Iqaluit	*In attendance: BIMC, NPC, NWB, NTI, QIA, GN, CTA, DFO, EC, NPMO, NRCan, PC and TC*
	Project Specific Distribution List	08/05/12	Public Notice of the Final Hearing issued	*Notice includes information regarding how to seek formal intervenor status at the Hearing*
	Public/Parties/ Intervenors	18/05/12	Applications for Intervention Status filed	*All applicants, Makivik Corporation, NMRIRB and Dr. Zacharius Kunuk (and his representative Lloyd Lipsett) granted Intervenor status*
	Public/Parties/ Intervenors	30/05/12 & 08/06/12	Final written submissions from parties and Intervenors	*Submissions filed by: QIA, GN, CTA, DFO, CCG, EC, INAC, HC, NRCan, PC, TC and Makivik Corp., NMRIRB and Z. Kunuk and L. Lipsett*

Abbreviations for parties: Baffinland Iron Mines Corp. (BIMC),Canadian Coast Guard (CCG), Canadian Transportation Agency (CTA), Department of Fisheries and Oceans Canada (DFO), Environment Canada (EC), Government of Nunavut (GN), Health Canada (HC), Indian and Northern Affairs Canada and subsequently Aboriginal Affairs and Northern Development Canada (INAC), Natural Resources Canada (NRCan), Nunavut Planning Commission (NPC), Northern Projects Management Office (NPMO), Nunavut Tunngavik Inc. (NTI), Nunavik Marine Region Impact Review Board (NMRIRB), Parks Canada (PC), Qikiqtani Inuit Association (QIA), Royal Canadian Mounted Police (RCMP), Transport Canada (TC) and World Wildlife Fund (WWF)

Review Step	Responsible Party	Timeline DD/MM/YY	Processes	Notes/Issues
	Intervenor: Isuma TV (Z. Kunuk)	01/07/12	Request to film the Mary River Final Public Hearings in Iqaluit and Igloolik to document and increase public awareness and participation	*06/07/12 NIRB grants Isuma TV's request to film in accordance with conditions*
11 Final Hearing	Public/Parties/ Intervenors	16-28/07/12	Participation in Final Hearing, Technical Sessions and Community Roundtable Sessions in Iqaluit, Igloolik and Pond Inlet	*Appearances on the record include: BIMC, NPC, NTI, QIA, Community Representatives from Grise Fiord, Resolute, Arctic Bay, Clyde River, Hall Beach, Coral Harbour, Cape Dorset, Kimmirut and Iqaluit, Igloolik and Pond Inlet, members of the public in Iqaluit, Igloolik and Pond Inlet, GN, RCMP, CTA, DFO, CCG, EC, NRCan, PC, TC, Makivik Corporation, NMRIRB, L. Lipsett/Z. Kunuk, and WWF*

Abbreviations for parties: Baffinland Iron Mines Corp. (BIMC),Canadian Coast Guard (CCG), Canadian Transportation Agency (CTA), Department of Fisheries and Oceans Canada (DFO), Environment Canada (EC), Government of Nunavut (GN), Health Canada (HC), Indian and Northern Affairs Canada and subsequently Aboriginal Affairs and Northern Development Canada (INAC), Natural Resources Canada (NRCan), Nunavut Planning Commission (NPC), Northern Projects Management Office (NPMO), Nunavut Tunngavik Inc. (NTI), Nunavik Marine Region Impact Review Board (NMRIRB), Parks Canada (PC), Qikiqtani Inuit Association (QIA), Royal Canadian Mounted Police (RCMP), Transport Canada (TC) and World Wildlife Fund (WWF)

In addition to the consultation activities of the NIRB and the Proponent, increasingly, over the past decade, with better public access to the internet and Northern-based media outlets, the media have an important role in support of the NIRB’s goals of enhanced public awareness and participation by providing notice of meetings and hearings, disseminating information and, in some cases, providing interactive discussion forums that allow people to express their opinions and increase their understanding. In this Review, the Board notes the significant contributions of the media with respect to the Final Hearing specifically in the communities of Iqaluit and Igloolik. It is hoped that the presence of local, national and international media in these venues and live streaming of proceedings contributed to a heightened level of public awareness of both the Project and the NIRB’s Review process.

Unfortunately, however, where the media’s presence in Iqaluit and Igloolik were viewed as positive contributors to the process, the Board and the residents of Pond Inlet noted that the absence of media at the Final Hearing in Pond Inlet created a negative perception of the process:

> *…I am not too happy about the media not being here. We will be voicing our concerns, and we will express our views about what -- how -- how we feel and how -- what we think. I would like to see -- I wonder why CBC or any of the media people aren't here.*[19]

[19] S. Omik, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27(am), 2012, p. 2441, lines 20-26.

Although the Board notes that radio coverage and on-line streaming of the Pond Inlet portion of the Final Hearing was restored in the last part of July 27 and July 28, community members expressed concern to the Board that the lack of media coverage in Pond Inlet limited the ability of residents who could not be in attendance at the Final Hearing to remain informed and engaged.

3.1.2 Consultation with Adjacent Jurisdictions

Although the Proponent indicated that the proposed project activities would be conducted exclusively in the Nunavut Settlement Area (the NSA), as noted by the Minister in his letter of February 11, 2009 when he remitted the matter to the Board to conduct this Review the unprecedented ice breaking and year round shipping activity had the potential to have effects outside the NSA, and as such, he expressly stated: "Since the parties in adjacent jurisdictions might potentially be affected by the Proposal, I request the Board to encourage the participation of these groups in the review."[20] On this basis, the NIRB undertook the following consultation activities with respect to potentially-affected adjacent jurisdictions.

May 1, 2008: Makivik Corporation and Kativik Environmental Advisory Committee contacts are provided with initial notice of the NIRB's Screening for the Mary River Project Proposal through correspondence sent to a project-specific email distribution list. An opportunity to submit comments on or before May 23, 2008 is provided. This comment period is later extended to June 4, 2008.

June 27, 2008: NIRB issues its Screening Decision Report, recommending pursuant to NLCA Section 12.4.4(b) that the Mary River Project Proposal requires Review under NLCA Article 12 Part 5 or 6.

February 11, 2009: The Minister of Indian Affairs and Northern Development refers the Mary River project to the NIRB for a Review pursuant to NLCA Article 12, Part 5. The Minister provided the following additional direction to the NIRB:

> Pursuant to section 12.5.1 of the Agreement, I would like to identify a particular issue of concern for the Board to consider. Year-round shipping involving seasonal ice breaking at the rate proposed by the proponent is unprecedented in the North. As a result, I will be looking to the Board to carry out a very thorough assessment of the impacts related to this component of the Proposal, which as a starting point, will involve obtaining a clear description of the location of the shipping route for the project within the Nunavut Settlement Area. Since the parties in adjacent jurisdictions might potentially be affected by the Proposal, I request the Board to encourage the participation of these groups in the review.

February 17, 2009: Following receipt of assistance from the Nunavut Wildlife Management Board with identifying appropriate staff contacts within Makivik Corporation, the NIRB contacts Makivik Corporation via email, advising that the NIRB has commenced an environmental review of the Mary

[20] Letter of the Honourable Chuck Strahl to Lucassie Arragutainaq, Acting Chair of the NIRB, dated February 11, 2009, at p. 2.

River project. The NIRB offered background regarding the shipping associated with the proposal and requested assistance with obtaining contact information for Hunters' and Trappers' Organizations, Municipal Councils or any other potentially-interested parties in the Nunavik communities bordering the Hudson Strait.

February 23, 2009: The NIRB adds additional Nunavik contacts to its project-specific distribution list.

March 13, 2009: The NIRB issues a draft scope of the Mary River Project Proposal to its project-specific distribution list, with an invitation for the public to submit comments for the Board's consideration on or before April 9, 2009.

April 9, 2009: The NIRB receives correspondence from Makivik Corporation highlighting concerns with the potential impacts of the Mary River project, and in particular the impacts associated with the proposed shipping route and the volume of vessel traffic which would use Hudson Strait. With regards to the shipping associated with the proposal, Makivik stated the following:

> From our perspective, this is an issue that will require consultation with the Nunavik Communities that are situated along the Hudson Strait. The project must be presented in detail to those communities, as well as to Makivik Corporation. Once properly informed, we will make the appropriate representations to the NIRB. Our representations will include, but not be limited to, potential environmental impacts that may result from use of the proposed Hudson Strait shipping route all year round.

Makivik indicated that consultation was required, and that the project must be presented in detail to both Nunavik communities and to Makivik. In closing, Makivik noted a need for additional information and offered assistance to the NIRB for conducting information sessions in Nunavik:

> Makivik requires further and more precise information to properly assess the potential impact of the Mary River Project for the Nunavik Inuit. In specific, we wish to receive more detailed shipping routes for all phases of project development and implementation. Therefore, Makivik Corporation submits the current comments under reserve of its right to bring other issues to the attention of the NIRB on this matter.
>
> Makivik Corporation is available to assist the NIRB and the promoter of the project to plan for an information tour to take place in Nunavik and Stas Olpinski may be contacted to act as a liaison in this regard.

April 17, 2009: the NIRB issues correspondence in response to Makivik Corporation's April 9, 2009 comment submission, acknowledging the importance of ensuring Makivik and Inuit of Nunavik interests are considered in the Review, and requesting advice or assistance in scheduling of information sessions in Nunavik. The NIRB proposes conducting a public scoping session with Makivik Corportation in Kuujuaq to ensure that Nunavik interests have been considered in the development of Environmental Impact Statement Guidelines for the Mary River Project Proposal. The NIRB encourages Makivik Corporation to provide input into the EIS Guidelines while noting that all Nunavik-based contacts would receive these draft guidelines and have an opportunity to provide comments for consideration before issuance to the proponent.

The NIRB also requests advice or assistance from Makivik Corporation in the scheduling of NIRB information sessions in the Hudson Strait communities of Ivujivik, Salluit, Kangiqsujuaq, and Quaqtaq to ensure that interested residents in these communities have an opportunity to participate fully in the NIRB process. In concluding, the NIRB states that it is "very committed to ensuring full participation in the NIRB process by the residents of the Nunavik region and [we] are open to suggestions from Makivik as to how to best facilitate this."

April 21, 2009: The NIRB distributes correspondence received from Baffinland Iron Mines Corporation on April 21, 2009 to the Board's project-specific distribution list. Baffinland's correspondence includes two figures meant to clarify the proposed primary shipping route to and from the proposed port at Steensby Inlet, providing additional clarity with respect to the proposed shipping route to and from the proposed port at Steensby Inlet and addressing the Minister's direction for the NIRB obtain "a clear description of the location of the shipping route for the project within the Nunavut Settlement Area."

May 6, 2009: The NIRB writes to the Nunatsiavut Government and related contacts, requesting appropriate contacts for potential Nunavut-based impact assessments that may be of interest to the Nunatsiavut Government and its people. The NIRB provides notification regarding the Board's Review of the Mary River Project Proposal, noting its significant shipping component through Hudson Strait and providing an overview of the procedural history of the NIRB's assessment of the proposal. The Board also indicates the following:

> While our Board has specific responsibilities to the Inuit of the Nunavik region of Northern Quebec through Article 40 of the NLCA, we also would like to ensure that the Nunatsiavut Government and its people have an opportunity to participate in our process should they consider themselves affected by this project.

May 20, 2009: The NIRB issues email correspondence to Makivik Corporation, noting that no response had yet been received to the NIRB's April 17, 2009 correspondence and again seeking Makivik Corporation's advice and assistance on the NIRB's proposed approach to consultation with Nunavik groups.

May 29, 2009: Makivik Corporation issues email correspondence to the NIRB, acknowledging the Board's intention to conduct information sessions in the communities of Ivujivik, Salluit, Kangiqsujuaq and Quaqtaq and further recommending that the communities of Akulivik, Puvirnituq and Inukjuaq should also be consulted given their subsistence harvesting activities in the Hudson Strait area.

June 5, 2009: Makivik Corporation issues correspondence to the NIRB, advising that Makivik supports the NIRB's decision to postpone information sessions in Nunavut until the Fall season when it is expected that more community residents will be available.

August 26, 2009: The NIRB receives email correspondence from Makivik Corporation. Noting that the NIRB has been attempting to establish contact with little success, Makivik provides contact information for organizations within the seven Nunavik communities which the NIRB has scheduled information sessions in.

September 14-20, 2009: The NIRB conducts public consultation and information meetings in communities identified by Makivik Corporation as being potentially impacted by the Project, specifically by the proposed year round shipping through Hudson Strait. The public meetings were held from

September 14 to September 20, 2009 in seven villages of the Nunavik Region: Puvirnituq, Inukjuak, Akulivik, Ivujivik, Salluit, Kangiqsujuaq and Quaqtaq.

October 1, 2009: The NIRB meets with Makivik Corporation and Baffinland Iron Mines Corporation in Montreal to provide an update on the NIRB's Review process and opportunities for public engagement.

November 27, 2009: the NIRB issued a summary report on its information meetings in the Nunavik regions, explaining the objectives of the meetings as follows:

> These public meetings held by the NIRB staff are an essential component of the NIRB's review process. Through the public information meetings, the NIRB collected and categorized comments, concerns, and traditional and local knowledge received from members of the potentially affected communities, related to the project proposal, with a focus on the year round shipping component. Issues and concerns raised at the public meetings in Nunavik, combined with the input from members of the Nunavut Settlement Area have greatly assisted NIRB in its development of project specific guidelines to be issued to the Proponent for its preparation of an Environmental Impact Statement (EIS) for the Project.

June 7, 2010: The NIRB issues email correspondence to Makivik Corporation, again requesting appropriate contact information for the Nunavik Marine Boards and indicating an interest in potential attendance by NIRB staff at the next meeting of the NMRIRB, to present on the NIRB Screening process and associated operating procedures.

June 7, 2010: The NIRB receives separate email responses from Makivik Corporation representatives, providing contact information for the Nunavik Marine Region Wildlife Board, the Nunavik Marine Region Impact Review Board and the Nunavik Marine Region Planning Commission. Makivik Corporation indicates that the next planned meeting of the NMRIRB has been pushed back until September, further noting that dates will be provided to NIRB once set, as the offer of training from the NIRB would be of great value to the Boards.

February 23-24, 2011: The NIRB hosts a training session with the newly established NMRPC and NMRIRB. An introduction to the NIRB's Review of the Mary River Project Proposal is provided within the presentation materials, however due to time constraints the full presentation is not delivered but is left for reference by the Boards.

December 16, 2011: The NIRB issues separate follow-up correspondence to Makivik Corporation and the NMRIRB, providing a copy of the PHC Report and seeking to ensure that both groups are aware of the opportunities to participate in the NIRB's Review process. The NIRB also notes the following: "also highlighted within the PHC Decision is direction to the Proponent to ensure that its FEIS submission includes further discussion of consultation undertaken with adjacent jurisdictions, including communities or organizations within the Nunavik Region of Northern Quebec."

February 8, 2012: The NIRB provides an update to the NMRIRB during its regular Board meeting via teleconference, regarding the Review of the Mary River Project Proposal.

March 7, 2012: the NIRB meets with staff of Makivik Corporation, NMRWB, NMRPC, NMRIRB to provide parties with an update on the Review of the Mary River project, with discussion of next steps and opportunities to participate. As agreed to by all parties, next steps are to include:

Next steps for the NIRB:

1. NIRB to continue to provide Makivik and Nunavik groups with written notice of opportunities to participate in the NIRB's assessments of projects near to or with potential to impact on the Nunavik Marine Region

2. NIRB to remain open for dialogue at any time regarding how to effectively participate

3. NIRB to continue to provide NMR Impact Review Board with guidance materials and support for capacity building

Next steps for other participants:

1. Makivik and Nunavik boards intend to participate through the final phase of the NIRB's Review for the Mary River project, with planned submission of IRs and written comments and attendance at the Technical Meeting and Final Hearing.

2. Makivik and Nunavik boards to further discuss how to best coordinate their participation in the NIRB Review

3. Makivik and Nunavik boards to organize Nunavik community reps for Final Hearing in Iqaluit, with NIRB support

May 1-3, 2012: The NIRB hosts technical meetings in Iqaluit. A Makivik Corporation representative participates via teleconference.

May 18, 2012: The NIRB receives Intervenor applications for the fFinal Hearing from Makivik Corporation and the Nunavik Marine Region Impact Review Board.

May 23, 2012: The NIRB issues correspondence to Makivik Corporation and the Nunavik Marine Region Impact Review Board, granting each party Intervenor status for the Final Hearing in Iqaluit, as requested.

July 16-20, 2012: Representatives from Makivik Corporation and the Nunavik Marine Region Impact Review Board attend the NIRB's final hearing in Iqaluit, providing formal interventions.

3.2 The Participants

3.2.1 Nunavut Planning Commission (NPC)

The NPC is an Institution of Public Government established under the Nunavut Land Claims Agreement (NLCA), with responsibilities for land use planning in Nunavut under Article 11 of the NLCA. The NPC prepares and implements land use plans that guide and direct resource use and development within the Nunavut Settlement Area. As already outlined in detail in section 1.8 of this report, with respect to the

Mary River Project Proposal, the NPC's role has involved the joint review, with the NIRB, of the 34 kilometre portion of the proposed Railway that is located within the area covered by the North Baffin Regional Land Use Plan.

3.2.2 Nunavut Tunngavik Inc. (NTI)

NTI is a privately incorporated organization that is the successor to Tungavik Federation of Nunavut, the signatory to the Nunavut Land Claims Agreement (NLCA). NTI is responsible for representing the Inuit of all the regions and communities of Nunavut to safeguard, administer and advance the rights and benefits that belong to the Inuit of Nunavut and to promote their economic, social, and cultural well-being through succeeding generations. NTI advances and protects Inuit interests and ensures that the commitments made under the NLCA are met. With respect to the Mary River Project Proposal, NTI are the owners of the minerals that would be mined, and consequently, NTI would be responsible for ensuring that the project complies with NTI's mining policy, reclamation policy, and resources revenue policy.

3.2.3 Qikiqtani Inuit Association (QIA)

QIA is a Designated Inuit Organization under the Nunavut Land Claims Agreement, representing the rights and values of the Inuit within the Qikiqtani concerning rights to water and wildlife compensation, landowner rights, and negotiations of an Inuit Impact and Benefit Agreement. The QIA participated in all stages of NIRB's environmental review process for this Project. To aid in additional communication and engagement with communities specific to the Mary River Project, QIA formed and administered seven Mary River Project Committees and their comments were included in its final submission. QIA's view of the Project was that provided the conditions presented in its final submissions were accepted by all parties, appropriate mechanisms are in place to effectively monitor and manage the Mary River Project in an acceptable manner. QIA stated that any remaining outstanding issues can be dealt with in reference to the recommendations and information requested in its final written submission. QIA emphasised in its final submission that that the success of the Mary River Project demands continued work and collaboration with communities after the permitting process and throughout the life of mine.

3.2.4 Government of Nunavut (GN)

While the federal government currently has authority over the management of mineral resources in Nunavut, the GN has significant jurisdictional responsibility and permitting authority over activities that affect wildlife and wildlife habitat, Commissioner's lands, municipalities, education, health, social services, public safety, culture, community development, property rights, and the administration of the laws in Nunavut. It is the GN's objective to ensure that mineral resource projects in Nunavut are developed in a manner that respects, protects and cares for the land, animals and the environment. At the same time the GN is responsible to ensure that the Mary River Project will create positive effects on the socio-economic conditions of the territory by providing opportunities for employment, education and training to Nunavummiut. Ultimately, the ability of Nunavummiut to take advantage of available employment is the foundation to any of the benefits of the Mary River Project.

The GN recognized that the opportunities offered by the Project may be substantial. As a result, the GN's position was that it is vital that any Project Certificate prepared by NIRB ensures that the purported benefits of the project will in fact materialize and accrue to the residents of Nunavut. The focus of the GN's final submissions was to provide the Board with its views as to whether the GN agreed or disagreed with the Proponent's conclusions regarding the Project's potential ecosystemic and socioeconomic impacts, and the adequacy of proposed mitigation, enhancement and monitoring measures. The GN Departments participating in the Review included the Department of Culture, Language, Elders and Youth ("CLEY"), the Department of Economic Development & Transportation ("ED&T'), the Department of Education ("EDU"), the Department of Environment ("DOE"), the Department of Finance (FIN), the Department Health & Social Services ("HSS"), the Department of Justice (DOJ), and the Nunavut Research Institute (NRI).

3.2.5 Aboriginal Affairs and Northern Development Canada (AANDC)

AANDC is the federal government department responsible for meeting the Government's obligations and commitments to First Nations, Inuit and Métis, and for fulfilling the federal government's constitutional responsibilities in the North. AANDC reviewed the Final Environmental Impact Statement for the Mary River Project from the perspective of water quality and quantity, land related issues such as vegetation and permafrost, and socio-economic impacts and benefits. In their submission AANDC stated that the Proponent provided sufficient information in these areas of review to satisfy the majority of the issues that were identified during earlier stages of the review process. In their final submission AANDC identified some minor outstanding issues relating to further refinement of management plans as they related to revegetation trials, wastewater management and hazardous materials management, which can be addressed through revisions to management plans as they are updated in the future or through further discussions with regulators during the upcoming permitting/licensing phase.

3.2.6 Canadian Transportation Agency (CTA)

CTA is an independent, quasi-judicial tribunal and economic regulator. It makes decisions and determinations on a wide range of matters involving air, rail and marine modes of transportation under the authority of Parliament, as set out in the *Canada Transportation Act* and other legislation. Among the determinations it makes, CTA approves specific Railway line construction projects. For these projects, CTA assesses the impact of new construction on the environment. Given that the *Nunavut Act* establishes federal authority over the territory of Nunavut, CTA indicated that the proposed Railway connecting the Mary River Mine to Steensby Inlet is a Railway within the legislative authority of the Federal Parliament.

In its final submissions CTA addressed 1) the proposed Railway, 2) alternatives in routing, design and operation, 3) the impact of the Railway on the caribou and ways to mitigate these impacts, 4) impacts to traditional land users 5) emergency response, and 6) noise and vibration impacts. CTA advised in its final submission that given the limited experience of Railway construction and operation in high arctic conditions it is difficult to predict problems that could occur and to suggest appropriate mitigation measures.

3.2.7 Environment Canada (EC)

EC is responsible for leading implementation of the Government of Canada's environmental agenda and is committed to contributing to the realization of sustainable development in Canada's North. EC's mandate covers the preservation and enhancement of the quality of the natural environment, including water, air, soil, flora and fauna, as well as species at risk and migratory birds. In addition to EC's mandate to conserve and enhance the quality of the natural environment, the Department administers s. 36(3) of the *Fisheries Act* which prohibits the deposit of a deleterious substance into fishbearing waters. EC also administers the permitting of disposal at sea and participates in the regulation of toxic chemicals and the development and implementation of environmental quality guidelines pursuant to the *Canadian Environmental Protection Act*, 1999 (CEPA 1999). EC is responsible for protecting and conserving migratory bird populations and individuals, under the *Migratory Birds Convention Act,* 1994 (MBCA), and administers the *Species at Risk Act* (SARA) in cooperation with Fisheries and Oceans Canada and the Parks Canada Agency.

In their final submission EC emphasized the limitations imposed by the unprecedented nature and scale of the Mary River Project and lack of current baseline data on the arctic environment. EC's view is that these shortcomings underscore the need for a precautionary approach and a rigorous and comprehensive suite of monitoring programs that can address gaps in baseline knowledge, detect project-related impacts in the face of substantial natural variation and inform adaptive management to minimize further impacts as the project proceeds. EC acknowledged that the Proponent in this review did commit to address outstanding gaps in baseline knowledge by undertaking further surveys and contributing to existing field programs led by EC and by forming working groups to solicit input and guidance from federal and territorial government agencies and the Qikiqtani Inuit Association in the development of their monitoring programs. EC notes that these measures should help to ensure that adequate baseline data has been collected and that monitoring programs are sufficiently developed should the Mary River Mine become operational.

In its final submission EC states that issues related to the following topics had not yet been adequately addressed: 1) air quality monitoring to demonstrate that ambient standards are being met, 2) uncertainty of some effects, 3) conservatism in impact assessment, 4) monitoring to address outstanding knowledge gaps or data deficiencies, detect the magnitude of residual effects and identify adaptive management triggers to prevent or minimize these effects, and 5) consideration of wildlife and the incorporation of the information provided in the NEB spill response gap analysis study into emergency response planning.

3.2.8 Fisheries and Oceans Canada (DFO)

The federal government exercises authority over seacoastal and inland fisheries within Canada's territorial boundaries. DFO's primary focus in reviewing proposed developments in and around fishery waters is to ensure that the works and undertakings are conducted in such a way that the proponents are in compliance with the applicable provisions of the *Fisheries Act*. DFO's environmental assessment and regulatory review of the Mary River Project is based in large measure on sections 32 and 35 of the *Fisheries Act.* Section 32 prohibits a person from killing fish by a means other than by fishing unless the person is authorized to do so. Section 35 prohibits the harmful alteration, disruption or destruction of fish habitat without authorization. DFO's assessment has concluded that the Proponent has

underestimated the risk to marine mammals from cumulative direct and indirect impacts of year-round shipping and has recommended that additional effective mitigation measures be identified, with a plan to implement these measures in place prior to commencement of marine shipping. In the expert opinion of DFO, the monitoring program submitted by the Proponent in their FEIS needs to be developed further and must be demonstrated to have sufficient power to confirm impact predictions, verify the efficacy of mitigation measures and detect negative impacts to marine mammals before risks become unacceptably high.

3.2.9 Canadian Coast Guard (CCG)

As a Special Operating Agency of the DFO, the CCG helps the DFO meet its responsibility to ensure safe and accessible waterways for Canadians. The CCG also plays a key role in ensuring the sustainable use and development of Canada's oceans and waterways. With respect to marine shipping oil pollution prevention and preparedness and response in Canadian waters, both CCG and Transport Canada have responsibilities.

The CCG indicated that with respect to the CCG's existing emergency response capacity in the Arctic, there are existing resources such as Arctic Community Packs, large scale depots in Tuktoyaktuk, Iqaluit and Churchill, an air transportable system in Hay River and the response equipment caches of CCG ice breakers operating in the Arctic that would be available to respond to any incidents requiring emergency response. Further, the CCG indicated that other national and international assistance could also be enlisted if necessary to augment existing resources. CCG also committed that shipping data from the shipping associated with the Mary River Project would be incorporated into the CCG's review of shipping activity in the Arctic to determine if any changes to the CCG's existing response capability would be required. CCG also indicated that monitoring shipping activity in the Arctic is accomplished through the Northern Canada Vessel Traffic Services Zone regulations (which requires reporting prior to entering, while operating and upon exiting Canada's northern waters in the MCTS centre in Iqaluit) and also a Federal Long Range Identification and Tracking System that provides information on the position of vessels in Canadian waters, including the Arctic.

3.2.10 Health Canada (HC)

HC is the federal department responsible for helping the people of Canada maintain and improve their health. HC noted in its final written submission that the Mary River Mine is in a remote location with no human settlements nearby, although the site will include workers' accommodation. HC's final submission is in reference to air quality, noise, and the contamination of food. Regrettably, a representative from HC did not appear at the Final Hearing.

3.2.11 Natural Resources Canada (NRCan)

NRCan regulates the manufacturing and storage of explosives through the federal *Explosives Act*. If approved, the Mary River Mine would require explosives manufacturing or explosives storage during construction at four locations – the mine site, Steensby Port, Milne Port and along the Railway. The

Mary River Mine will require both manufacturing and storage of explosives at the mine site during mine operations.

Beyond its regulatory role, NRCan is the Government of Canada’s principal earth sciences agency, providing Canadians with reliable geomatics and geoscience advice and knowledge. NRCan is also a source of scientific research and advice on mining and mineral technology for the mining and minerals industries as well as territorial and federal government departments that promote or regulate these industries.

Specific to the Mary River Mine proposal, NRCan engaged experts within the Earth Science Sector’s Geological Survey of Canada to provide advice in three subjects: 1) permafrost and geotechnical science, 2) engineering geology, and 3) coastal geomorphology. NRCan also engaged experts within the Mineral’s and Metals Sector CANMET Mining and Mineral Sciences Laboratories to review the Proponent’s acid rock generation and metal leaching assessment in the FEIS. Overall, NRCan finds that detailed engineering design should be able to address its recommendations.

3.2.12 Parks Canada (PC)

PC has a broad mandate for ecological integrity, cultural resource management and traditional use, and park user experience for national parks, including Sirmilik National Park which is located near the proposed Mary River Mine.   PC also has a mandate in the context of the proposed National Marine Conservation Area (NMCA) in Lancaster Sound and adjacent waterways, including Eclipse Sound and Pond Inlet. Under the *National Marine Conservation Areas Act* shipping is an allowed activity in an NMCA, with the standard expectation that it be conducted in accordance with all applicable regulations and best practices.   PC’s interests are not in regards to shipping, *per se*, but rather in the effects of the shipping on the sustainable use of the marine ecosystem and its productivity. PC’s main interests in this regard are associated with the movement and introduction of non-native species, and changes in water quality.

In its final submission PC reported that its mandate and its point of view concerning its areas of interest in the environmental review are shared with several other reviewing agencies which possess extensive scientific experience. PC advised that it supported the technical analysis and conclusions of these agencies.

3.2.13 Transport Canada (TC)

TC is responsible for transportation policies and programs that promote all parts of the transportation system to work effectively and in an integrated manner, so as to provide Canadians with a sustainable transportation system that is safe, secure, efficient and environmentally responsible. The Department also has a responsibility to regulate associated transportation infrastructure, equipment and personnel in accordance with the legislation and regulations within the mandate of TC. While TC has the federal lead in regulating shipping, it recognizes other federal agencies and departments (including the DFO, CCG and EC) who participated in the review of the Mary River Project and their distinct but interrelated responsibilities for the management of marine transportation safety and environmental protection in the Arctic. Specifically, TC is the lead regulatory agency responsible for reviewing the various emergency

and contingency plans associated with marine shipping in Canadian waters. TC also conducts marine pollution aerial surveillance operations under the National Aerial Surveillance Program. In the case of this environmental review TC organized several working groups with the Proponent to address areas within its mandate. TC's final submission addressed 1) marine transportation safety and security, 2) rail transportation safety, 3) transportation of dangerous goods, and 4) aviation safety.

3.2.14 Makivik Corporation (Makivik)

Makivik is a signatory to the Nunavik Inuit Land Claims Agreement (NILCA) and has a duty to protect the integrity of the NILCA and the mandate to ensure the economic, social, and cultural well-being of the Nunavik Inuit. Makivik is also charged with protecting the rights of the Nunavik Inuit that flow from the James Bay and Northern Quebec Agreement (JBNQA) and the NILCA. Additionally, Makivik, on behalf of the Nunavik Inuit, is the owner of 80% of the islands in the Nunavik Marine Region (NMR).

In its written intervention, Makivik indicated that while Baffinland has stated that the proposed shipping route is entirely within the Nunavut Settlement Area (NSA), Makivik believes that ice conditions, other climatic conditions, and the pressure imposed by the economic necessity of having the iron ore arrive at market in the quickest possible manner will result in some shipping occurring within the NMR. Additionally, deviations to the shipping route (proposed by the Proponent as a result of avoidance of marine mammals or other vessels) will result in further incursions into the NMR by the iron ore carriers or supply ships. According to Makivik, the Mary River Project will have significant effects upon Nunavik Inuit and the NMR and these anticipated effects trigger the environmental review process of the NMRIRB mandated by the NILCA. Makivik was of the opinion that there should be no permits, licences or authorizations granted by the federal government in relation to the Mary River Project until such time as the environmental review process has been completed by the NMRIRB. Makivik clarified that the comments provided in its final submission to NIRB in this environmental review were provided without prejudice to the requirement that the Mary River Project, insofar as the marine traffic in Hudson Strait impacts will affect Nunavik Inuit and the NMR, undergo a separate environmental review process before the NMRIRB under the NILCA. Makivik's submission for the NIRB Final Hearing concerned effects to the marine environment in Hudson Strait and deficiencies noted regarding the significance of impacts upon marine mammals and other biota.

3.2.15 Nunavik Marine Region Impact Review Board (NMRIRB)

The NMRIRB's objective as established in section 7.2.5 of the Nunavik Inuit Land Claims Agreement (NILCA) is to ensure that any activities that will occur within the Nunavut Marine Region (NMR) and the areas of equal use and occupancy will be undertaken in a manner that complies with current activities within the NMR and will not adversely affect the existing and future well-being of the persons and communities resident in or using the NMR, or the ecosystemic integrity of the NMR.

The NMRIRB intervened in the environmental review of the Mary River Mine in order to evaluate the Proponent's conclusions regarding the Mary River Project's potential impacts in the NMR and the areas of equal use and occupancy. The NMRIRB's main concern was with the Marine Environment, Cumulative and Transboundary Effects Assessment in the Final Environmental Impact Statement. The NMRIRB indicated that the effects of the Mary River Mine on the NMR and the areas of equal use and

occupancy merit an in-depth analysis yet to be carried out. According to the NMRIRB, in addition to the NIRB process, the Mary River Project should be subject to the NMRIRB review process provided for in the NILCA.

3.2.16 Zacharias Kunuk – Nunavut Independent Television Network, Isuma Distribution International Inc. and Kigullitt Productions Inc.

Dr. Kunuk intervened as an Inuit filmmaker and hunter who has spent his life in the region of the proposed Mary River Mine. The intervention was in two parts. Part One was a written submission in English. Part Two was in audio and video formats in Inuktitut and is available on the internet at www.isuma.tv/DID. Dr. Kunuk's intervention concerns the Inuk point of view on matters of human rights, wildlife, family life and the potential value of social media to the NIRB environmental review process. Dr. Kunuk's intervention included the participation of Lloyd Lipsett, a human rights lawyer, working on a Human Rights Impact Assessment of the Project to be completed by the end of 2012 .

In Dr. Kunuk's submission he stated that Inuit living in the communities potentially most affected by the Mary River Mine (Igloolik, Pond Inlet, Arctic Bay, Hall Beach, Clyde River, Kimmirut and Cape Dorset) have not been adequately informed or consulted concerning the impacts of the mine. Dr. Kunuk reported that the consultation of Inuit in this environmental review consisted of the Qikiqtani Inuit Association (QIA), with the Proponent's financial assistance, establishing a 42-member committee of six Inuit in each of the seven communities representing different local organizations. Dr. Kunuk pointed out that many of the participants on these committees were unilingual in Inuktitut and could read, yet they met to discuss original English-language documents with only the aid of written Inuktitut 'summaries' prepared by QIA. To mitigate the insufficiencies of the consultation process from his perspective, Dr. Kunuk's project, *Ataatama Nunanga, My Father's Land* has used radio, video, local TV and internet to give Inuit more information and a chance to speak their concerns in oral Inuktitut about the Mary River Project and NIRB's environmental review. Dr. Kunuk indicated that by raising the level of informed participation especially among the population under 30 (which is the majority population) the Inuit are in a better position to make decisions concerning their future well-being.

3.2.17 Local Communities Represented

In its Preliminary Hearing Conference Decision, the NIRB noted that while a late Spring/Summer date for the Final Hearing might present a challenge for potentially affected communities to fully participate during times when community members are typically engaged in traditional activities, pursuant to Section 12.2.27 of the NLCA:

> All necessary steps shall be taken by way of notice, dissemination of information, and scheduling and location of hearings to provide and promote public awareness of and participation at hearings.

In its Preliminary Hearing Conference Decision, the Board indicated that the Final Hearing would be held in the City of Iqaluit, and the Hamlets of Igloolik and Pond Inlet, and further committed to taking steps to ensure that a broad range of representatives from the potentially affected communities of Arctic Bay,

Cape Dorset, Clyde River, Coral Harbour, Grise Fiord, Hall Beach, Resolute, and Kimmirut would have an opportunity to participate in the Final Hearing.

The NIRB therefore invited five (5) community representatives from each of the eleven (11) communities identified as being potentially affected to attend the Final Hearing in Iqaluit. Community organizations were contacted in order to solicit representatives from broad demographic groups to participate, including local women's groups, Hunters and Trappers Organizations, Elders' societies, Hamlet Councils, and youth groups. Where no local group existed, the NIRB sought advice from regional associations and organizations in order to confirm participants for the Final Hearing.

A total of 41 community representatives from Arctic Bay, Cape Dorset, Clyde River, Coral Harbour, Grise Fiord, Hall Beach, Resolute, and Kimmirut as well as three local Iqaluit community representatives participated in the community roundtable portion of the Final Hearing in Iqaluit.

The format of the Final Hearing in Iqaluit allowed the community representatives to observe the technical presentations of Baffinland and Intervenors over the first three days of proceedings. Community representatives attended these first days as well as the final two days which were dedicated community roundtable sessions. During these roundtable sessions, community representatives from each community were invited to sit at the table with the Board to hear shortened presentations by Baffinland which explained project components in detail. Community representatives were then invited to pose questions to Baffinland and/or Intervenors and to address comments to the NIRB Board. These sessions were well attended and had all seats at the roundtable filled with community representatives.

Similar community roundtable sessions were held at both the Igloolik and Pond Inlet venues as well, where technical sessions took only one day of the proceedings while two days were focussed on providing community members in these two communities with an opportunity to participate in the Hearing. Community representatives seated around the table at all three of the venues took advantage of the opportunity to pose questions to Baffinland and the various intervening agencies, and to express their comments and concerns to the Board during the proceedings. Specific reference to relevant comments, issues and concerns expressed by community representatives at the Final Hearing in relation to particular effects are described in detail in Sections 4 and 5 of this report, however, Table 1 that follows provides a very brief summary of the key issues, concerns and perspectives offered by the community representatives and members of the public during the community roundtable sessions.

Table 1: Key issues as raised by community representatives

Subject	Issues/Concerns/Comments
ECOSYSTEMIC EFFECTS	
Climate (including climate change)	Ensuring project has factored potential effects of climate change into design for the long term Accounting for unpredictable ice conditions that are now resulting from climate change and will further be affected by year round shipping Greenhouse gas emission modelling due to use of diesel for power taken into account in assessment of effects over the life of the mine
Air Quality	Risk of dust from the mine and rail affecting vegetation, wildlife

Subject	Issues/Concerns/Comments
	and people, including small mammals such as lemmings What will the emissions from the smelting of the iron ore in Europe be as these emissions could end up coming down in the Arctic
Noise and Vibration	Potential for polar bears to react to shipping noise by staying closer to communities where noise levels are lower Impacts of noise associated with trains Noise effects associated with shipping especially during ice covered conditions and the unknown effects on marine mammals
Landforms, Soils and Permafrost	Potential for Railway embankments to create hazardous snow conditions What will the area be like following reclamation of the mine, Railway, road and the port Potential for quarry sites for soapstone to be negatively affected Effects if permafrost underlying Railway breaks down unexpectedly How big will waste rock piles be and where will they be stored Concern that there hasn't been a Railway constructed in Arctic terrain such as this recently in Canada
Vegetation	Potential for contamination of vegetation due to project activities, spills, etc. (and subsequently affecting the food chain)
Freshwater Quality and Fish	Effects on fish and fish passage during construction of water course crossings for Railway, including effect on water quality and fish due to use of explosives and effects associated with use of metal culverts Will leaching from waste rock and build up of water in the mined out pit have effects on the surface waater quality and will there be requirements imposed regarding water quality before water can be discharged from the mine site Is it true that there is no processing only crushing so no tailings facilities
Terrestrial Wildlife and Habitat	Unpredictability of effects of Railway on caribou migration, mortality, calving, etc. and uncertainty regarding whether caribou crossings will work, whether caribou will be attracted to train tracks, reactions to tunnels and likelihood of trains hitting caribou Potential effects on terrestrial wildlife, including caribou, during the use of explosives in the construction phase Will minimum flight altitudes be imposed to prevent impacts to terrestrial wildlife
Birds	Potential for migratory birds migration to be affected by year round shipping and increased air travel Effects of shipping on nesting grounds (including nesting grounds close to shorelines) Effects on migratory bird sanctuaries given routing of ships close to sanctuaries Will minimum flight altitudes be imposed to prevent impacts to

Subject	Issues/Concerns/Comments
	migratory birds
Marine Environment, Water, Ice and Sediment	Loss of ice during year round shipping with the potential to limit winter travel routes amongst North Baffin communities Sediment impacts that could affect the food species (including plankton) relied on by walrus, whales and other marine mammals The potential for the release of ballast water to affect water quality in Steensby Inlet or result in the introduction of invasive species or release of bacteria/viruses Effects on water quality associated with blasting, dredging and other activities required to make the port deeper Effectiveness of the use of markers and other means to identify shipping route for people traversing the ice How will garbage and sewage from ships be disposed of at sea and while in port If Marine Conservation Area is designated later by the Federal Government, will that prevent shipping
Marine Wildlife and Marine Habitat	Impacts of year round shipping on polar bears Requests to suspend shipping in certain areas (pupping/calving/denning) during parts of the year when marine mammals are particularly vulnerable Potential for marine wildlife to be contaminated by emissions from ships Potential for marine mammals impacted by year round shipping to permanently abandon areas adjacent to shipping lanes Potential for marine wildlife to be attracted to open water and suffer adverse consequences when ice breaking opens lanes What seasons and limitations (e.g. light conditions, ice conditions) will affect marine mammal monitors on ships How will community quotas for marine mammals, such as whales and polar bears be affected if BIMC activities result in mortality How will communities be compensated if harm to commercial fisheries result Concerns that use of navigational aids (sonor in particular) may impact marine wildlife
SOCIO-ECONOMIC EFFECTS	
Population Demographics	Fly in and fly out policy and potential effects on in-migration from communities to the south and from hamlets to bigger centres
Education and Training	Availability of on-the-job training and ability of employees to get training and certifications that can be transferred to other employers, other jobs, etc. Whether not having a University degree, high school, speaking English or driver's licence will be a barrier to being employed at the site and whether a criminal record will be a barrier to being employed Use of Inuit instructors for on-site training Will Inuit be stuck in entry level positions or will opportunities for

Subject	Issues/Concerns/Comments
	advancement be available
Livelihood & Employment	Support for the mine contingent on employment opportunities and business opportunities being available for community members in the North Baffin Will Inuit and North Baffin residents in particular be given priority to access job opportunities When and where will communities start to see job opportunities and advance training for the mine development Will parties other than the Proponent create jobs associated with the Project (e.g. monitoring officers, enforcement personnel, etc.) Will the Project create job opportunities specifically for women How will Project employees be compensated when the mine closes
Economic Development & Self Reliance	If done right the Project could provide lasting benefits to infrastructure, employment and training Could reclamation plans include leaving buildings and roadways intact for other uses Concerns regarding the effect of increases in income causing increases in rental rates for government housing creating a disincentive for working at the mine
Human Health and Well-Being	Addressing potential for increased drugs and alcohol use/dependency and associated social problems Potential for health impacts if harvest of country foods is reduced or if there is contamination of local sources of country food Access to Inuit counsellors and Elders both on and off-site for support of workers and their families Request consideration of how Baffinland’s shipping may assist communities with resupply and/or supplementing existing transportation for goods from the south Handling notification of family members when employees on-site suffer health incident and require treatment or medivac Potential for 2 week in/2 week out rotation to contribute to family problems Potential for increases in rates of domestic and sexual violence/exploitation Will the project sites have health care centres
Community Infrastructure and Public Services	Contribution to increased community capacity for social supports such as funding addictions centres, community-based counsellors, etc. Safety issues created by firearms being available on-site to support harvest activities Potential creation of infrastructure strains on housing, medical services, childcare, counselling, policing and correctional services Baffinland should find ways to support home ownership amongst their workers Can some infrastructure (roads, Railways, docks) be left intact when the mine ceases operations and be made available for the

Subject	Issues/Concerns/Comments
	communities to use Would like to see infrastructure such as airport improvements and dock facilities provided in the communities closest to the project sites Will communities play a role in providing workers to help in the post-closure reclamation and monitoring Will the Project contribute to better regular schedules for flights amongst North Baffin communities where they do not need to be routed through Iqaluit
Contracting and Business Opportunities	Want to ensure that small and local businesses will have access to contracting and business opportunities; that it won't only be large companies from the south who benefit Ensure Inuit contractors include those in the High Arctic and are not just based out of Iqaluit How to ensure that businesses are given support to prepare themselves to be able to take advantage of business opportunities
Culture, Resources and Land Use	Preservation, protection of archaeological resources from damage Why there is no location in Nunavut for preservation and display of archaeological artifacts from Nunavut's communities (currently only in Yellowknife) Request to ensure former residents of Steensby Inlet are brought to the area for a visit prior to development Ensuring unilingual Inuktitut speakers are not discouraged or limited in their ability to rise in the organization by a lack of English Ensure respect for the Inuit culture, which is different, in all local communities Pleased to see restoration and reclamation planning included at this early stage
Benefits, Royalties and Taxation	Extent of and basis for compensation to harvesters whose harvests are adversely impacted by the project activities How distribution of benefits amongst North Baffin residents most impacted by the Project will be fairly carried out Ensuring benefits accrue to local government authorities (e.g. City and Hamlet) as they do not get direct payments from Baffinland Communities closest to the Project should receive the greatest share of the benefits Rejection of the project will significantly limit all future developments in the region
OTHER ISSUES	
Accidents and Malfunctions	Safety of ore carriers given the large size and the strong currents in Steensby Inlet Monitoring of overwintering fuel vessel to ensure potential leaks are identified before large scale damage occurs Potential for ore carriers to become stranded in unpredictable sea ice Ensuring that there is sufficient capacity close by to respond to

Subject	Issues/Concerns/Comments
	accidents, spills and malfunctions, with particular concerns expressed regarding responding to spills under ice and the fact that Canadian Coast Guard is only present in the Arctic in the open water season Request to ensure that communities receive training to be able to do some emergency response tasks Plans to reclaim a sunken ship and its cargo in the event of major accident Insurance set aside to address accidents and malfunctions Concerns emergency shelters along the Railway may be insufficient for the high snowfall conditions surrounding parts the Railway Can double hulled fuel vessel be punctured enroute to Steensby Port and then once frozen into the ice
Alternatives	Requests to consider alternative shipping routes farther away from some communities and traditional harvesting or transit areas
Cumulative Effects	Potential for year round shipping to speed development of Northwest Passage as main shipping route Monitoring of cumulative effects over longer time horizon (5-10 years) Will other deposits (other than Deposit #1) be developed
Community Engagement	Communities need to have access to monitoring results and project information on an ongoing basis Will NIRB report and recommendations be released publicly at the same time as the Minister receives the report
Government Capacity	Will devolution of responsibility to Government of Nunavut be accelerated due to this Project How will Governments ensure compliance with terms and conditions in a Project Certificate How will all parties ensure that the project is carried out in a way that restores public confidence in government institutions and the project proponent Will Parks Canada put preservation measures in place to conserve wildlife, birds and other natural resources in the park at Bylot Island What is a Development Partnership Agreement (between Baffinland and the Government of Nunavut) and what issues are addressed in this Agreement
Monitoring	Monitoring systems must be robust and must include community input and communication back to communities to be effective Inuit diets should be monitored to detect any changes and the presence of contaminants

4. ECOSYSTEMIC EFFECTS

4.1 Meteorology and Climate (including Climate Change)

4.1.1 Views of the Proponent

The following are the predicted impacts of the Project on climate change and the effects of climate change on the Project as identified by the Proponent in the FEIS:

- Over the next several decades, precipitation and evaporation in the Project area are both expected to increase due to climate change. The change to the overall moisture input is expected to be minimal. Overall wind speeds are not expected to change significantly over the life of the Project
- Extreme weather (i.e. significant snowdrifts, extreme rainfall events), as well as global climate change, has the potential to affect Project infrastructure and in turn represents a risk to human safety and the environment.
- Changes in sea ice cover due to climate change will not significantly affect the shipping operations in the Foxe Basin. Climate change will affect sea levels however; Steensby Port is in an area of falling sea levels.
- The permafrost active layer depth is projected to increase by approximately 50% for most permafrost regions in the High Canadian Arctic over the next 100 years. This is predicted to have little effect on the very cold and deep permafrost conditions in the mine site area over the planned life of the Project. Snow depths are not expected to change over the life of the Project
- Over its life, the production of greenhouse gases by the Project will increase, potentially by as much as twice the current greenhouse gas emissions for Nunavut. This is not a significant change on a national or global scale.

The Proponent has stated that communities close to the project area have expressed concerns about the potential effects of climate change on the Project and the impact of the Project on climate change.

To prevent or mitigate the potential impacts of the Project on climate change and the effects of climate change on the Project, the Proponent has proposed to undertake the following measures:

- Potential implications for the stability and safety of infrastructure due to climate change on hydrology and permafrost have been taken into account in the engineering design of the Project. The Project facilities for Steensby Port will be conservatively designed to account for changes in sea levels.
- Baffinland will attempt to mitigate climate change and reduce the increase in greenhouse gas emissions due to its activities by using arctic grade diesel fuel and using rail transportation of ore rather than shipping by truck.
- Baffinland will also explore ways of conserving energy as the Project moves through development and will adapt accordingly.

- Baffinland will also report annually on performance indicators, including energy use and greenhouse gas emissions management by the Project.

The Proponent concluded that the effects of the Project on climate change are not significant and that a cumulative effect on climate change will not occur through the Project's release of greenhouse gases. These emissions will be very small compared to national greenhouse gas emissions and insignificant in terms of global greenhouse gas emissions. In addition, the effects of climate change on the Project have been mitigated through conservative design of the Project.

4.1.2 Views and Concerns of Interested Parties

On the subject of the impacts that meteorological conditions, including climate change, could have on the Project and the effects of the Project on climate change, several intervenors provided comments and recommendations that are relevant to this topic in their final written submissions to the Board and during their presentations at the Final Hearing.

Fisheries and Oceans Canada (DFO) in its comment related to the influence that climate change could have on the overall process of noting effects, stated that the task of documenting effects, such as those related to shipping traffic on marine mammal behaviour, distribution, habitat use, reproduction or health is challenging scientifically given the natural variability of environmental characteristics and other factors intrinsic to species. DFO also noted that the task is further exacerbated in the Regional Study Area (RSA_ by the ongoing changes in Arctic climate and expected changes in ice and other oceanographic conditions that have indirect and direct effects on marine mammals and local abundance and health.

In addition to commenting on the potential for climate change conditions to unfavourably influence the documentation of effects, during the Final Hearing DFO provided details on some of the climate change initiatives that it has undertaken to date, which include studies on fisheries adaptations to range extensions and contractions of freshwater, marine fish, and marine mammals due to climate change; and research on climate-related changes in marine invertebrate communities and the risk of aquatic invasive species in the north.[21] The information provided by DFO was in response to questions by Mr. Lloyd Lipsett and Dr. Zacharias Kunuk's on climate change and the potential impacts on marine mammals and ice conditions.

In Environment Canada's (EC) final written submission to the Board, it commented on air quality monitoring not necessarily in the context of climate change; however, at the Final Hearing, EC stated that climate change is of concern to Environment Canada and that over the past 20 years or so, there has been modelling and research done to look at the potential impacts of climate change on Canada and, particularly, the north, and the models have indicated that the most significant impacts of climate change will likely be manifested in the north first.[22] The information provided by EC was also in response to a question from Mr. Lloyd Lipsett and Dr. Zacharias Kunuk regarding climate change and how EC is approaching this issue.

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[21] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012, p. 2348, lines 12-23.
[22] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 24 (am), 2012, p. 1618, lines 20-26.

Natural Resources Canada (NRCan), in its comments on stability analysis and climate change, stated that its notes that the Proponent plans to conduct additional analysis, including thermal and stability analysis, and that post-FEIS commitments have been made by the Proponent to incorporate climate change in the analysis. Baffinland in its responses to interveners' final written submissions provided in Exhibit 2[23] indicated that it notes NRCan's comments.

On the issue of climate and coastal shoreline changes, NRCan mentioned that the impacts of anthropogenic climate change are considered to be occurring in Nunavut and that consideration is required of sea level and sea ice changes, future wave climate and future storm surge climate on coastal infrastructure, such as port docks, which may not be removed after the Project is completed, as well as any additional future developments at the port sites. NRCan indicated that it agrees in principle with the assessment of sea level change in Steensby Inlet proposed by Baffinland and that NRCan may be able to contribute updated information that revises the global sea level rise and considers the distribution of melt water based on source as it becomes available. NRCan recommended that Baffinland address its post-FEIS commitment to continue GPS monitoring, or monitoring using a similar method, at both port sites and use tide gauges at Steensby Port site to monitor relative sea level and storm surges before or during construction.

At the Final Hearing, NRCan reiterated its comments related to the impacts that climate change and Project infrastructure, particularly the RRailway, could have on the Project area:

> *Construction and operation of a Railway in permafrost environments can change the thermal regime of the ground, which can change drainage and make the ground unstable. Both these changes and the effects of climate change and variability have implications for Railway integrity, which, in turn, can have impacts on the environment.*[24]
>
> *Ground instability resulting from project activities or associated with climate change and variability can also have implications for the integrity and performance of the Railway infrastructure which can potentially have impacts on the environment.*[25]

The Qikiqtani Inuit Association (QIA) in its final written submission stated that interactions may occur among Project activities and between VECs and VSECs that increase or decrease the cumulative impact of the Project and that other human activities, natural stressors such as climate change, and developments including Project expansion may also impact the VECs and VSEC.

Further, the QIA included in *Appendix B* to its final written submission, the Mary River Project Committee Minutes. The minutes generated by the Pond Inlet Mary River Committee dated March 30, 2012 highlighted that the committee notes that Baffinland intends to make available to interested persons on a perpetual basis reports related to climate change. Further, the committee expressed the

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[23] "Baffinland Response to Agency Submissions –Final Environmental Impact Statement – May 30, 2012,"dated July 11, 2012.

[24] J. Clarke, NRCan, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 846, lines 3-9.

[25] A. Baker, NRCan, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (am), 2012, p. 2392, lines 25-26, p. 2393, lines 1-4.

need for a laboratory that is based in the Baffin Region to monitor and collect data on climate and the environment as well as concerns about potential changes in the landscape and permafrost in that might be caused by the Project.

In addition to the comments and recommendations provided by the intervenors in their final written submissions and during the Final Hearing, the Board and several participants at the Final Hearing, also expressed concerns about the potential effects of climate change on the Project and *the impacts of the Project on climate change*. One such concern raised by the Board's staff is as follows:

> *...And maybe if you could give us a bit of a description on how -- along the track alignment, including the tunnels, how how does Baffinland account for any -- any permafrost changes to deal with climate change and regular shifting and melting and shifts in stability along the Railway, how that's being addressed?*[26]

In response to the NIRB's question, Baffinland stated that the Railway embankment will be created in the first stages of construction and it will involve compaction; however, there are expectations that there will be depression and some requirements to fill affected areas during the first few years of operation. In addition, Baffinland stated that issues related to settlement will be addressed as part of a regular maintenance program.

The NIRB's staff also questioned Environment Canada at the Final Hearing on whether it has assessed the potential impacts of the proposed Project on air quality and greenhouse gas emissions:

> *Has Environment Canada assessed the potential impacts to air quality from the proposed operation of -- of project locomotives, including local air quality effects from idling of locomotives at the proposed Steensby Port and Mary Ri -- Mary River mine, as well as the operation of locomotives along the proposed Railway, and, if so, can Environment Canada comment on any potential impacts to local air quality and overall contributions to Nunavut greenhouse gas emissions identified from this pro -- proposed activity?*[27]

Environment Canada, stated in response that the expert that did the reiview was not at the hearing; however, the understanding is that EC would have looked at all sources of air emissions including those emissions from the Railway, transportation and camps and the impacts are as described in the FEIS to EC's submission [28]

The Mayor of the Hamlet of Pond Inlet, Mr. J. Killiktee, also raised concerns about climate change when he questioned the Canadian Coast Guard (CCG) on whether or not Inuit services and participants were involved in research carried out on Arctic sea ice and climate change.[29] The Canadian Coast Guard responded that there are many participants in the research being conducted on this issue in the

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[26] R. Barry, NIRB, NIRB Final Hearing, File No.: 08MN053 Transcript, July 16, 2012, p. 95, lines 20-26.
[27] R. Barry, NIRB, NIRB Final Hearing, File No.: 08MN053 Transcript, July 24 (am), 2012, p. 1621, lines 6-15.
[28] S. Forbrich, EC, NIRB Final Hearing, File No. File No.: 08MN053 Transcript, July 24 (AM), 2012, pp. 1621-1622, lines 21-26 and lines 1-7.
[29] J. Killiktee, Pond Inlet, NIRB Final Hearing, File No.: 08MN053 Transcript, July 28 (am), 2012, p. 2694, lines 11-16.

Canadian Arctic including ArcticNet, researchers from different universities and the National Oceanic and Atmospheric Administration Association from the United States.[30]

In addition, a member from the community of Grise Fiord, expressed his/her sentiments, concerns, and perceptions about climate change:

> *As a small community, we are in support of this. We have a vast environment even though we are a small community, and the climate change, it's getting warmer, and I think everything is feeling the climate change, even our immediate environment species like our wildlife that we eat are feeling it, and at the same time, we can't run our environment. We are just part of the ecosystem that we have to adapt to the change, and we're going to have to do that if we want to eat and still have country food to eat.*[31]

A member from the community of Igloolik questioned Baffinland about the alternatives considered for power generation and the amount of greenhouse gas that will be generated by the Project:

> *…You talk a lot about the diesel fuel. Have you considered, say, for alternatives, for power generation, other than diesel fuel, considering the potential impacts it could have, and you'll be overwintering diesel fuel? You continually tell us that -- that potential impacts will be minimized, even -- even if there was a spill, it's so volatile that 90 percent of it would evaporate, so over 20 years, you'll be emitting a lot of greenhouse gases because you will generate power through diesel. Do you have a model or estimates on how much greenhouse emissions you'll be producing over the life of the mine?* [32]

Baffinland in its response stated that it had examined hydroelectric power as an alternative for power as required by the NIRB guidelines and that hydroelectric power is still being considered for future years of the Project. With regards to the question on the total quantity of emissions that will be produced by the Project, Baffinland stated that it was required to model and assess emissions of sulfur dioxide and oxides of nitrogen; therefore, that component of greenhouse gas emissions were assessed and modelled.[33]

4.1.3 Views of the Board

The Board is reasonably satisfied with the degree to which Proponent has accounted for the effects of the Project on climate change and incorporated these considerations into the Project's design factors to address potential variability in site conditions that may be attributable to climate change. The Board notes however that information and assessments involving the potential impacts that climate change could have on the Project and the effects of the Project on climate continues to evolve; therefore, the

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[30] P. D'arcy, CCG, NIRB Final Hearing, File No.: 08MN053 Transcript, July 28 (am), 2012, p. 2694, lines 18-24.
[31] M. Kigutak, Grise Fiord, NIRB Final Hearing, File No.: 08MN053 Transcript, July 19, 2012, p. 1091, lines 25-26, p.1091, lines 1-8
[32] P. Ivalu, Igloolik, NIRB Final Hearing, File No.: 08MN053 Transcript, July 20, 2012, p. 1164, lines 3-15.
[33] O. Curran, Baffinland, NIRB Final Hearing, File No.: 08MN053 Transcript, July 20, 2012, pp. 1164-1165, lines 18-26 and lines 1-8.

Proponent needs to remain committed to revising and updating the current information and predictions to account for any relative variations and changes that had not been anticipated. Given the potential for significant, but unanticipated effects associated with climate change, the Board, urges Baffinland to remain vigilant in updating its assessment of climate change and its related effects on the Project.

As expressed by several invervening parties, the Board is also of the view that the impacts of extreme meteorological events on the Project and related considerations for Project design and planning have the potential to create significant challenges for the Project. Some of these events include the following: extreme temperature and precipitation events, high winds and waves, ice ride-up and pile-up events, extreme ocean water levels (high and low), severe fog or white out conditions, disruption in operations, and phyisical damage to infrastructure. In addition, potential changes to the timing of ice formation, active layer thickness, and frequency of storms also pose some challenges.

The Board has been taken note of comments from intervenors and the public about the need for further consideration to be given to uncertainties related to climate change predictions and the related effects on other predictions in the FEIS, including water quantity and flow and permafrost thawing. In addition, the Board expects Baffinland's future consideration of climate change impacts to include consideration of all likely climate change scenarios, rather than designing and applying a single "best guess" scenario. In addition, the Board expects the assessment of likely scenarios to also include the assessment of the corresponding long term implications to the Project under each scenario as well.

During the Final Hearing, the Board also heard concerns expressed by community representatives and members of the public about the need for considering measures that could be implemented to allow for public access to weather related information for the various sites associated with the Project. The Board recognizes that this information, about the specific weather conditions at the Project sites could be very useful for the family members of workers on-site to understand when weather conditions may affect their return home. In addition this data will also add to the available data records for the region and may provide useful baseline for a variety of purposes. The Board recognizes that there may be several government departments responsible for collecting and releasing this data that will need to be consulted in order for this to happen, but the Board encourages all parties to work collaboratively to make access to this information a reality.

Given that arctic char and lake trout are staple food item in most communities in Nunavut, the Board views the potential direct and indirect effects that climate change could have on meteorological and hydrological conditions as well as the diversity of freshwater biota the local and regional area as a potential challenge that will need to be continually assessed to minize uncertainties and associated potential impacts.

4.1.4 Conclusions and Recommendations of the Board

1. With the objective of providing appropriate feedback on the impacts that climate change might be having the port facilities, the Proponent must fulfill the commitment made its FEIS to undertake and provide the results of continued GPS monitoring, or monitoring using a similar method, at port sites and tide gauges at the Steensby Port site to monitor relative sea level and

storm surges before and during construction. It is recommended and expected that similar type monitoring shall be carried out during the operation phase of the port facilities.

2. To satisfy the concerns of interested and intervening parties, the Proponent shall provide to the affected comunities, relevant regulatory authorities, and interested parties the results of any new or revised assessments done to validate and update climate change impact predictions for the Project and the actual effects of the Project on climate change in the Local Study Area and Regional Study Area.
3. In order to confirm that the Proponent is exploring and implementing concrete steps to reduce greenhouse gases, the Proponent shall provide interested parties with evidence of continued initiatives undertaken to reduce greenhouse gas emissions, as part of its annual reporting, throughout the life of the Project.
4. To actively engage Inuit in initiatives related to climate change, where it is feasible, the Proponent shall endeavour to include the participation of Inuit from affected communities and other communities in Nunavut when undertaking climate-change related studies and research.
5. The Proponent shall endeavour to explore and implement reasonable measures to ensure that weather-related information for the various Project sites are readily accessable to the public on a continual basis throughout the life of the Project.
6. In accordance with the measures proposed in the FEIS, the Proponent shall provide, as part of its annual reporting to interested parties, the results of calculations conducted to determine the level of SO_2, NO_X emissions and greenhouse gases generated by the Project using fuel consumption or other relevant criteria as a basis.

4.2 Air Quality

4.2.1 Views of the Proponent

Assessments of emissions involving gases and particulates to the atmosphere from Project-related activities, anticipated effects of those emissions, and baseline conditions in the Regional Study Area (RSA) were presented within the FEIS. The Proponent concluded that the existing air quality in the Project area is typical of a remote environment, and further, indicated that the the Project has the potential to impact air quality, specifically noting that these effects may occur owing to the generation of total suspended particulate (TSP or dust), inhalable particulate matter, sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and carbon monoxide (CO). Sources of these emissions were noted to occur at Milne Port, along the Milne Inlet Tote Road, and as a result of other operations including incinerator operation and idling locomotive engines.

The Proponent noted that aircraft emissions were not assessed due to the intermittent nature of this source activity, and further, that dust generation along the Railway was expected to be limited to particles released during the loading of ore cars at the minesite. Baffinland's FEIS indicated that it expects that no significant windblown dust emissions are anticipated during the rail transportation of the ore.

Baffinland’s FEIS predicted that air quality parameter concentrations would be expected to measure in excess of their respective thresholds as a result of project activities, however it further noted that these exceedances would be generally confined to the local study areas and that they would be generally reversible. Baffinland indicated that the effects of the proposed Project on air quality parameters were predicted to be “not significant.

Results of its air quality assessment indicated that total suspended particulates (TSP), metals, PM_{10} and $PM_{2.5}$ concentrations at the proposed mine site and at Steensby Port could be of concern. Baffinland noted that visual observations would confirm the sources of excessive dust emissions and that corrective actions would be taken as required. Further, Baffinland indicated that information collected as part of its periodic dustfall sampling would be used to confirm modelling predictions as presented, and noted that dust deposition (measured as TSP) was predicted to occur mainly as a result of ore handling.

Baffinland’s FEIS indicated that as concentrations and deposition of particulates would likely be largest nearest to the sources of emission and would likely decrease with increasing distance, it did not include a larger regional study area or an assessment of cumulative effects within the FEIS.

With respect to gaseous emissions, Baffinland’s FEIS indicated that it proposes to calculate the emissions of SO_2, NO_X and greenhouse gases based on Project fuel consumption.

Baffinland confirmed during the Final Hearing that its air quality monitoring plans for the project would include monitoring of $S0_2$ at the accommodations area at Steensby Port and that this information would be used to compare to the modelling undertaken and to validate any predictions made.[34]

The FEIS as prepared by Baffinland provided monitoring and mitigation measures that were designed to prevent or minimize the potential impacts of the Project on air quality:

- An air quality monitoring program is proposed for each of the main project sites during the first few years of operation to confirm effects predictions.
- A number of pollution control measures are proposed to minimize impacts on air quality, including the following best management practices for limiting air emissions: Using low sulphur arctic grade diesel fuel; Limiting driving speeds on roads; Enclosing ore crushing equipment and equipping vents with dust collection mechanism; Applying a dust suppressant in high traffic areas and on stockpiles; Purchasing equipment with lower emission levels or higher energy saving potential where feasible; Using granular material, where possible, for road construction; and Regular maintenance of equipment and vehicles.

In its FEIS Baffinland concluded that the implementation of its proposed monitoring and mitigation measures would ensure that the Project does not have a significant residual effect on air quality.

[34] M. LePage, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 16, 2012, p. 91, lines 21-26.

4.2.2 Views and Concerns of Interested Parties

Several parties provided comments pertaining to air quality during their final written submission and in their presentations at the the Final Hearing.

Fisheries and Oceans Canada noted in its final submission that it believes ore dust deposition will accumulate seasonally and would resut in pulse introduction into aquatic habitat. Further, Fisheries and Oceans Canada stated that Baffinland's analysis did not consider seasonal effects, which it indicated could affect egg survival for those fish species whose young hatch during the spring.

During the Final Hearing, the Government of Nunavut identified uncertainties regarding the cumulative effects of multiple stressors including road and train traffic, and specifically regarding dust emissions, as having potential impacts to caribou in particular.[35]

Additionally, the Qikiqtani Inuit Association noted in its final written submission to the Board that dust fall remains a concern for predicting, monitoring and mitigating effects on caribou.[36] The lack of information on caribou diet (especially use of lichens during calving as well as other seasons) was a noted concern, as was the uncertainty of the relationship between dust-loading of lichen and caribou foraging behaviour which may have the potential to cause changes in distribution.

In its final written submission to the Board, the Canadian Transportation Agency noted that Baffinland's FEIS predicted that any potential dust deposition from the rail transportation of iron ore would not be significant. The Canadian Transportation Agency further noted in its written submission to the Board that Baffinland's draft Air Quality and Noise Abatement Management Plan provided no proposed monitoring of dust from the rail transportation of ore and suggested that including this monitoring early in the operations of the Railway would confirm Baffinland's prediction that the dust deposition would not be significant.[37]

Members of the public also noted concerns with respect to Railway-generated dust and the indirect impacts that may result:

> *"When the railroad starts moving back and forth, there's going to be contamination from the dust from the railroad containers and the soot coming from the carbon monoxide. It's going to make our environment unclean, and us northern people from the Arctic,…our air has been contaminated from all over, and it's…not immediately affecting you. It's affecting us because we have to live here."*[38]

Baffinland responded that its assessment had considered dust that would be emitted from the Project and that could potentially affect country food, and that its assessment found the level of heavy metals in this dust to be very low, the dust generated would be generally contained at the mine, and that no dust

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[35] P. Hale, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18 ,2012, p. 618, lines 9-15.
[36] Qikiqtani Inuit Association, Final Written Submission, May 30, 2012.
[37] Canadian Transportation Agency, Final Written Submission, May 30, 2012.
[38] G. Nookiguak, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 423-424, lines 19-26 and 1.

would be expected to be generated from the Railway, and that the quality of country food would not be contaminated as a result of the Project.[39]

Environment Canada recommended in its final written submission to the Board that the Proponent consult with Environment Canada in developing its Air Quality and Noise Abatement Management Plan and that the monitoring plan specifically include dustfall monitoring along the Railway corridor.[40]

During the Final Hearing, Baffinland committed to monitoring dust along the first few kilometres of the rail corridor where trains depart from the mine site loaded with ore for the Steensby Inlet Port site.[41] Baffinland also committed to extending these monitoring efforts further along the rail line if results of the initial monitoring indicate that more fugitive dustfall is present than was anticipated.[42]

During the Hearing, Environment Canada questioned Baffinland's proposed methods for validating predicted exceedances of SO_2 emissions over water at the proposed Steensby Inlet Port site and specifically expressed concerns that Baffinland clarify whether it proposed to monitor SO_2 exceedances on land:

> *…As you're aware, that is one of our recommendations, and I would like to refer to slide 55 where you had indicated that the air quality monitoring has been conservative in nature, and my question relates to -- that sulfur dioxide exceedances are anticipated to be over the water, and my question to you is how does Baffinland intend to validate the sulfur dioxide modelling predictions and ascents of sulfur dioxide exceedances at the port itself, on land.*[43]

Baffinland's response indicated that it planned to undertake passive monitoring near employee accommodation residences at the Steensby Port site.[44]

Environment Canada further noted during questioning by the Proponent that in its opinion, Baffinland's plan to undertake passive monitoring would not be sufficient to capture possible exceedances of SO_2.[45]

With respect to incinerator use, EC's final written submission to the Board suggested that Baffinland adopt the Alberta objectives as outlined in the FEIS as relating to air quality thresholds where appropriate and further recommended that Baffinland complete stack emission testing for all incinerators to ensure compliance with the *Canada Wide Standards for Dioxins and Furans* and the *Canada Wide Standards for Mercury*. Environment Canada indicated that these stack tests should be completed using typical project waste streams including dewatered sewage sludge. In its response to

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[39] R.Cook, Baffinland, NIRB Final Hearing, File No.: 08MN053 Transcript, July 18, 2012, p. 425, lines 9-22.
[40] Environment Canada, Final Written Submission, May 30, 2012.
[41] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2498, lines 1-2.
[42] R. Cook, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 16, 2012, p. 91, lines 6-9.
[43] S. Forbrich, EC, NIRB Final Hearing, File No.: 08MN053 Transcript, July 16, 2012, p. 91, lines 11-20.
[44] M. Lepage, RWDI, NIRB Final Hearing, File No.: 08MN053 Transcript, July 16, 2012, p. 91, lines 22-26.
[45] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012 p. 734, lines 13-18.

final written submissions, Baffinland committed to completing a one time stack test as recommended,[46] and EC stated during the Hearing that its concerns related to this issue had been addressed.[47]

Several members of the public also discussed their concerns regarding impacts to air quality resulting from the Project, recognizing that direct and indirect Project impacts to air quality can carry far beyond the immediate Project area:

> *You probably won't agree with me -- us coming from community, from Clyde River community. Normally the wind comes from the direction where the project is going to be. I think there is a chance, the fact that the pollution is going to come to our way -- to our community, especially terrestrial wildlife, such as what they eat from the land, such as lichen. I would like to see the study to be done in the -- in that area, in our community.*[48]
>
> *When there was a certain question being raised on the climate change, how much pollutant will be submerging from Baffinland? My question is not on Baffin -- is not at Baffin Island, not the island, not Foxe Basin, but on the other end where the ship will go to, how much pollutant will be accelerated (sic) from the iron ore when it's being -- it's melted. How much pollution will be lifting off at that region? The reason why I'm asking this question is because with the high-volume modifier that we had here in Igloolik, we had collected pollutants from all over the world, mainly from developing worlds, and that's when I first learned: What goes up, must come down. In the hot countries everything goes up. In the cold countries, everythinggoes down. And these are the questions that we have to ask. How much of those pollutants will be going up? It's not only the mine, but also at the other end. You talked about buildings being structured from steel. Iron ore is extremely important because making steel. How much of those pollutants will go up?*[49]

4.2.3 Views of the Board

Section 8.1 of the Board's EIS Guidelines as issued for the Project required that Baffinland provide an assessment of the dispersion of Project emissions on a local and regional scale.[50] In its FEIS, Baffinland concluded that because concentrations and deposition of particulates were expected to be greatest at points nearest to the sources of emission and these would likely decrease with increasing distance, it had not included a regional study area or an assessment of cumulative effects within the FEIS, nor did it propose within its Biophysical Environmental Effects Monitoring Framework any regional collection of

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[46] NIRB Final Hearing File No.: 08MN053, Exhibit 2, "Baffinland Response to Agency Submissions—FEIS, May 30, 2012", dated July 11, 2012, filed by Baffinland, July 16, 2012.
[47] S. Forbrich, Environment Canada, NIRB Final Hearing, File No.: 08MN053 Transcript, July 18, 2012, p. 722, lines 4-13
[48] J. Enuaraq, NIRB Final Hearing, File No.: 08MN053 Transcript, July 19, 2012, p. 996, line 21 to p. 997, line 4
[49] G. Qulaut, NIRB Final Hearing, File No.: 08MN053 Transcript, July 24 (pm), 2012, p. 1797, line 14 to p. 1798, line 9.
[50] NIRB Guidelines for the Preparation of an Environmental Impact Statement, November 16, 2009, p. 44.

data in order to validate these predictions.[51] In the Board's view, however, this prediction does require validation, and the Board shares Environment Canada's concerns that limiting monitoring efforts to sites nearest to sources of emissions may not capture less localized impacts to air quality that may be occuring at other locations within the regional study area.

Based on the information presented in the FEIS and the representations made by interested parties, the Board believes that although the quantity of air emissions generated from Project activities and facilities might not be significant from a global or regional perspective, there is the potential that the effects produced and manifested, even from levels of contaminants considered to be insignificant, may be evident because the Project arexa has not been previously exposed to the anticipated levels of contaminants and as such may be more sensitive to these effects than predicted in the FEIS.

The Board agrees with the concerns expressed by the Government of Nunavut, Canadian Transportation Agency, Environment Canada, and members of the public regarding dust emissions along the Railway. The Board recognizes that Baffinland has committed to monitor dust along the first few kilometres of the rail corridor leaving the Mary River mine site, but feels that additional monitoring and adaptive management measures should be provided and implemented in order to address potential impacts, especially to vegetation and caribou.

The Board notes diverging opinions between Environment Canada which contended that passive monitoring may not be able to adequately capture SO_2 exceedances, and Baffinland who indicated that modelling shows the highest SO_2 emissions occurring offshore and resulting from ore carriers steaming away from port, and noted it was unable to monitor at these locations. Although Baffinland has proposed to calculate the emissions of SO_2, NO_X and greenhouse gases based on fuel consumption, the Board feels that the Proponent must demonstrate through ongoing monitoring of air quality at the mine site and at Steensby Inlet Port, that SO_2 and NO_X emissions remain within predicted levels and that, where higher than expected levels are encountered, it confirm that such exceedances are temporary and reversible in nature. This will assist the Board in its ongoing monitoring for the Project, and will serve to assist Baffinland in making informed and effected adaptive management decisions.

4.2.4 Conclusions and Recommendations of the Board

The Board, in considering those views of the Proponent and parties as outlined above, and throughout the assessment of the Project, has provided the following recommendations:

1. Prior to commencing construction activities, the Proponent shall update its Air Quality and Noise Abatement Management Plan to include an expanded regional study area and provide for land-based monitoring stations designed to capture operations phase ship-generated SO_2 and NO_2 emissions through Foxe Basin and along the Hudson Strait.

   The updated plan shall be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

[51] FEIS, Volume 10, Appendix 10D-13.

2. The Proponent shall demonstrate through monitoring of air quality at the mine site and at the Steensby Inlet Port site that SO_2 and NO_2 emissions remain within predicted levels and, where applicable, within limits established by all applicable guidelines and regulations. In cases where exceedances are manifested, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures. Results of this monitoring are to be included in the Proponent's annual reporting to the NIRB.
3. The Proponent shall provide within its annual report to the NIRB, calculations of greenhouse gas emissions generated by activities at the Steensby Inlet port and other Project sources including aircraft associated with the Project. Calculations shall take into consideration, fuel consumption as measured by Baffinland's purchase and use as well as the fuel use of its contractors and sub-contractors.
4. Prior to commencing construction activities the Proponent shall update its dust management and monitoring plan to address and/or include the following additional items:
    a. Outline the commitment to monitoring dust along the first few kilometres of the rail corridor leaving the Mary River mine site.
    b. Outline the specific adaptive management measures to be considered should monitoring indicate that dust deposition from trains transporting along the rail route is greater than initially predicted.

    The updated plan shall be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.
5. The Proponent shall develop and implement an Incineration Management Plan that takes into consideration the recommendations provided in Environment Canada's *Technical Document for Batch Waste Incineration* (2010).[52] The Incineration Management Plan shall be provided to the NIRB at least 60 days prior to the commencement of construction activities.
6. Prior to commencing any incineration of on-site Project wastes, Baffinland shall conduct at least one stack test immediately following the comissioning of each temporary and permanent incinerator. Following receipt of stack test results, the Proponent shall report these to the NIRB and to Environment Canada in its annual reporting to each, or sooner, as possible.

4.3 Noise and Vibration

4.3.1 Views of the Proponent

Baffinland's FEIS presented assessments of anticipated noise and vibration associated with the Project including the proposed mine site, Steensby Port and Milne Port. The assessment gave consideration to local study areas as noted to be remote in location and presently not influenced by any permanent human generated noise or vibration sources. Baffinland noted in its FEIS that for these reasons, it did not include a regional study area within its assessment of noise or vibration.

[52] Environment Canada, 2010. Technical Document for Batch Waste Incineration.

Noise

Where no specific noise management requirements or thresholds exist for Nunavut, Baffinland's assessment followed those presented by established directives and publications for Alberta and Ontario.

Baffinland noted that the potential noise effects from project activities is anticipated to include small exceedances throughout the lifetime of the Project, but that these would be confined to the local study area around the mine site and two port sites and would be considered to be fully reversible. As such, Baffinland concluded that the residual noise effects were minimal.

While no requirements in either of the Alberta or Ontario guidelines were provided for employee residences (camps), Baffinland's FEIS acknowledged that employee health demands an adequate sleep environment, and therefore provided proposed mitigation measures to be implemented if required and which would provide for acceptable levels of noise near accommodations, including:

- Relocation of the dwellings;
- Reorientation of the dwellings;
- Berms or noise barriers near the dwellings; and
- Upgraded building construction such as upgraded windows and mandatory air conditioning.

Baffinland's FEIS indicated that the residual noise effects of the Project were considered to be minimal and as such, it suggested that follow up monitoring would not be required. Therefore it has not proposed a follow up monitoring program.

Vibration

Baffinland's approach to assessing the effects of vibration included the identification and quantification of vibration emission sources, modelling levels of worst-case operations, comparison of model results to published vibration criteria and identification of incremental changes to assess significance of potential project effects.

The FEIS concluded that vibration effects would be not significant during the operations and closure phases for the proposed Project And that during construction, vibration effects would be considered minor, would be confined to the areas directly surrounding the proposed mine site and ports, and were therefore considered to be reversible with residual effects considered to be minimal. As such, Baffinland has proposed that no vibration controls would be required.

Baffinland's assessment concluded that the potential effects of both noise and vibration to human receptors would not be significant.[53]

4.3.2 Views and Concerns of Interested Parties

The Canadian Transportation Agency (CTA) indicated that provided that Baffinland incorporates mitigation measures as proposed within its FEIS, based on the modelling results presented, it was

[53] FEIS, Vol. 5, Section 3.0.

satisfied that the anticipated noise and vibration impacts from construction and operation of the RRailway to sensitive receptors would be within acceptable levels.[54] The CTA confirmed during the Hearing that the questions it had raised regarding possible sensitive human receptors to noise from the Railway in its final written submissions to the Board had been answered by Baffinland.[55]

In addition, members of the public raised concerns regarding the level of noise that could be expected as a result of Railway activity:

> *"Some of us that are widows, our husbands used to…go out hunting to the Mary River area and to the Steensby Inlet area also. The trains make a lot of noise from what I see on TV, and how much noise is that going to produce."*[56]

During the Final Hearing, Baffinland addressed a recommendation made by both the Qikiqtani Inuit Association and Fisheries and Oceans Canada's final written submissions regarding guidelines for the use of explosives, and specifically the requirement for a protective overpressure threshold of 50 kPa which DFO noted has been used at other mineral development projects in the Arctic to reduce the impacts to fish from the use of explosives.[57,58] Specifically, DFO noted that it agreed with Baffinland's proposal to work together at the regulatory stage in order to develop a detailed blasting management plan which resolves the difference of opinions regarding the chosen overpressure threshold levels.[59]

4.3.3 Views of the Board

The Board recognizes that relatively few issues remained with regard to noise and vibration following discussions held during the Final Hearing, however, it has identified certain issues which continue to warrant discussion and follow up.

The Board recognizes that Baffinland and Fisheries and Oceans Canada reached consensus regarding the timing of discussions related to the detailed design for explosives use, and recommends that a precautionary approach be taken when determining the overpressure threshold to be applied to explosives use for the protection of fish and aquatic life.

Given the large number of employees to be accommodated on site, the Board does not agree with Baffinland's proposal to forego monitoring of noise and vibration impacts to human receptors throughout the life of the Project. The Board feels that minimal noise and vibration monitoring should be undertaken at the Mary River mine site, and at both the Steensby Inlet and Milne Inlet port site accommodations.

Futhermore, the Board notes that there are currently no operating Railways within Nunavut and that members of the public had questions about the basic operation of this project component. As such, the

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[54] Canadian Transportation Agency, Final Written Submission, May 30, 2012.
[55] L. Fortin, CTA, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 705-706, lines 23-26 and 1-2.
[56] E. Sageaktook, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 1023, lines 19-25.
[57] Fisheries and Oceans Canada, Final Written Submission, May 30, 2012.
[58] Qikiqtani Inuit Association, Final Written Submission, May 30, 2012.
[59] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 773, lines 3-10.

Board recommends that the Proponent undertake consultation with all affected communities regarding Railway operations, and during these consultations, that it provide information including video, audio, and photographic representation as well as any other visual aids (i.e. models) that may assist the general public to better understand the Railway operation, as well as all safety considerations for members of the public who may be travelling around the project area.

4.3.4 Conclusions and Recommendations of the Board

The Board offers the following recommendations in order to mitigate potential impacts as relating to noise and vibration:

1. The Proponent is encouraged to work with Fisheries and Oceans Canada at the regulatory phase and to take a precautionary approach when selecting the overpressure threshold to be applied to explosives use for the protection of fish and aquatic life.
2. The Proponent shall conduct noise and vibration monitoring at Project accommodations sites located at the Mary River mine site, Steensby Inlet Port site, and Milne Inlet Port site. Sampling shall be undertaken during the summer and winter months during all phases of Project development, with reporting of results included with the Proponent's annual reporting to the NIRB.
3. The Proponent shall collaborate to the extent possible with the Qikiqtani Inuit Association and local Hamlet organizations when undertaking consultation with all affected communities regarding railway operations. During these consultations, it is recommended that the Proponent provide information including video, audio, and photographic representation as well as any other aids (i.e. models) that may enhance the general public's understanding of railway operations, as well as all safety considerations for members of the public who may be travelling around the project area.

4.4 Hydrology and Hydrogeology

4.4.1 Views of the Proponent

Hydrologic data collected from stream flow and water level monitoring stations was utilized during studies conducted to establish baseline water flow conditions for the Project area as mentioned in the FEIS. In addition, the combination of field and regional hydrologic information was used in assessing aspects of engineering design and environmental effects of the Project's activities on the flow and quantity of water in the Project area. The studies determined that stream flow typically begins in early to mid-June as temperature climbs above 0° C and ends between late September and late October; runoff increases very rapidly as a relatively low proportion of precipitation is lost to infiltration, evaporation and transpiration; the effects of rapid runoff are increased due to shallow permafrost, cool temperature and lack of vegetative cover; and that these events were attenuated to produce lower peaks and longer duration flow events in catchments with significant lakes.

The following outlines the predicted impacts of the Project on the flow of water within the Project area as identified in the FEIS:

- In general, there will be no major alterations in water quantities or drainage paths as a result of the Project (i.e. no dams or major watercourse diversions). Water will be withdrawn from several lakes to supply the camps. These withdrawals were estimated to be negligible relative to the amount of water in these lakes. The removal of water from lakes for water supplies, the diversion of watercourses, or the diversion of runoff into watercourses were all identified as potential issues that could affect fish and fish habitat.
- Culverts installed along the Railway, construction access roads and the Milne Inlet Tote Road will result in minor changes to surface water flows where sheet flow becomes concentrated as it flows through the culverts. Some culverts along the Milne Inlet Tote Road, already identified as being prone to blockage, are currently being closely monitored and will undergo resizing during construction activities to help prevent future blockages.
- Treated effluents from sewage treatment plants and ore stockpile areas will be discharged to the Mary River. These additional discharges are minor relative to the amount of flow in the Mary River.
- Water flow into the open pit is expected to be minor, consisting primarily of direct contribution during precipitation events and blowing snow events. Little, if any, dewatering of the pit will be required during operations. However, excess water that does collect within the open pit will be pumped from the pit to a settling pond. Runoff from the waste rock stockpile will be collected and directed to ponds so that solids settle out and will be monitored for compliance with government regulations before discharging into fish bearing waters.
- During closure and reclamation of the Project, all drainage and crossing structures along the alignments will be removed and natural drainage paths and water flows will be restored. During closure and post-closure, the Open Pit will be allowed to naturally fill with water to create a pit lake. The filling process should take approximately 85 to 150 years. Once filled, the pit lake will discharge to the Mary River.

To prevent or minimize the effects of the Project on water flow within the Local Study Area (LSA) and Regional Study Area (RSA), the proponent has developed and proposes to implement the following measures and monitoring programs as outlined in the FEIS:

- Monitoring of water in the pond collecting the discharge from the waste rock stockpile will verify water quality and water treatment will be carried out to meet established water quality limits if necessary. In addition, monitoring will be carried out to confirm that the diversion of runoff from the waste rock stockpile toward Camp Lake does not significantly affect juvenile fish in the stream flowing into Sheardown Lake.
- Project facilities will be designed to minimize impacts to fresh water quantity and to maintain current drainage patterns as much as possible. All new culverts installed along access roads and the Railway will be monitored throughout the life of the Project in order to quickly identify blockages. These blockages will be quickly cleared through high pressure wash.
- Baffinland will report annually on water takings and effluent discharge amounts as will be required by its water licence.

The Proponent has concluded that with the proposed monitoring and mitigation measures, the Project will not have significant effects on water quantities in the Project area.

The Proponent has stated that community concerns generally focused on the potential changes to water flows and quantities in the Project area and the effects of these potential changes on fish and fish habitat resulting from the Project.

4.4.2 Views and Concerns of Interested Parties

Aboriginal Affairs and Northern Development Canada (AANDC) mentioned in its final written submission that post-closure pit lake water quality requires additional mitigation measures and follow-up, and that clarification is required on the filling time assumed for the pit lake water quality modelling. To address these issues, AANDC recommended that a long-term monitoring plan and mitigation measures be developed; clarification be provided on modelling the long-term pit lake water quality for extended filling periods; and that confirmation be provided on whether future pit lake water quality models will account for early and scheduled mine closure scenarios (10, 15, 21 years, respectively). In response to AANDC's recommendations, Baffinland stated in Exhibit 2[60], that it will address the long-term planning and mitigation of pit water quality issues as part of the water licence process.

On the subject of effluent discharge, AANDC recommended that justification be provided on the appropriateness of modelling effluent releases to follow the natural hydrograph and that the Proponent incorporate into the relevant management plans the proposed measures that will be implemented to achieve this objective. Baffinland stated in Exhibit 2 that the receiving waters at the mine site have gauges equipped with radio telemetry for capturing real-time flow data, and that discharges can be accordingly synchronized with stream-flow variations. Further, Baffinland indicated its intentions to include details on this proposed approach in the relevant management plan and to provide stream hydrographs, daily discharge graphs and further details related to this recommendation as requirements in a water licence.

During its presentation at the Final Hearing, AANDC reiterated the issue surrounding pit lake water quality, initially identified in its final written submission:

> *The future pit lake will be one of the legacies of the Baffinland's Mary River project if approved. Data predictions of the future pit lake water quality must be made with a high degree of confidence. Where uncertainty remains, long-term monitoring must be in place, as well as plans for mitigation measures as needed during the post closure period. This issue requires further discussion with the company.*[61]

Another issue identified or recommendation made by AANDC pertains to reporting and incorporating ongoing test results for the neutralization potential-depleted humidity cells into the understanding of site ARD and the modification of the waste rock management and other treatment plans, accordingly, on an ongoing basis. Baffinland stated in its response contained in Exhibit 2 that it will address this issue in further details during the water licence process.

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[60] NIRB Final Hearing File No.: 08MN053, Exhibit 2, "Baffinland Response to Agency Submissions—FEIS, May 30, 2012", dated July 11, 2012, filed by Baffinland, July 16, 2012, Appendix 5: Terrestrial Environment Working Group Terms of Reference, subsequently referred to throughout this Section as simply "Exhibit 2".
[61] R. Aitken, AANDC, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 548, lines 18-25.

At the Final Hearing AANDC also re-emphasized its comments related to potential Acid Rock Drainage/Metal Leaching (ARD/ML) materials. It stated that there is a potential for release of toxins to the environment due to acid rock drainage and metal leaching from newly exposed rock. Therefore, future test results should be incorporated into management plans.[62]

On the subject of runoff and stream flow estimates, Environment Canada (EC) recommended that Baffinland and the NIRB recognize and consider the implications of the uncertainty in runoff and stream flow estimates used in project design. Further, EC stated that it notes that uncertainty, which will vary depending on the catchment, makes it difficult to define the risk of either under-design or over-design of engineering works. Baffinland in response indicated in Exhibit 2 that it has acknowledged uncertainty in the stream flow estimates due to the short period of records available; however, it addressed the issue by incorporating conservatism in the design. During the Final Hearing EC restated its comment on streamflow estimates and mentioned that it acknowledges Baffinland's response provided in Exhibit 2:

> *Environment Canada's research, during the international polar year, implies that errors in mean annual runoff could be as high at 150 percent. Uncertainty in flood estimates is comparable. Flood estimates are important considerations in project infrastructure design, such as bridges. Uncertainty in estimates of stream flow at the design stage introduces the risk of under-design in engineered works, which could increase risk of unintended discharge of effluent.*[63]

Natural Resources Canada (NRCan) in its comments about potential Acid Rock Drainage and Metal Leaching (ARD/ML) materials that might be encountered at the Project site stated that it is satisfied with Baffinland's responses to NRCan comments on the FEIS; however, it notes that consideration should be given to the following as the Project progresses:

a. Segregation of waste rock currently termed "deleterious ore" be given careful review and consideration for segregation during operation. It may be prudent to maintain in-pit disposal with an appropriate cover as a possible option among adaptive management measures.
b. Given the preliminary nature of the pit water quality estimates, careful consideration will need to be given to the duration of monitoring required after operation of the mine ceases.

Baffinland mentioned that it notes NRCan recommendations or comments in its response provided under Exhibit 2. At the final hearing NRCan revisited the above-mentioned recommendations, which was originally articulated in its final submission to the Board:

> *Impacts to water quality from acid rock drainage, NRCan agrees that including a sufficient cap of non-acid generating material should ensure that seasonal thawing is restricted to the cap and potentially acid-generating material remains frozen over the long term. In the final environment impact statement, the proponent provided information on its design approach to maintain frozen conditions beneath and within the*

[62] R. Aitken, AANDC, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 548, lines 1-7.
[63] S. Fobrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 723-724, lines 22-26 and lines 1-5.

waste rock pile over the long term, and its plans for additional thermal and stability analysis to be conducted during support -- to be conducted to support detailed and final design of the waste rock pile. Natural Resources Canada is satisfied with the proponent's proposed approach.[64]

4.4.3 Views of the Board

The Board, in considering the content of the FEIS and evidence provided at the Final Hearing, recognizes that the proponent is still in the process of collecting data and confirming possible and/or selected options for some activities and facilities that could potentially impact the quantity and flow of water within the Local Study Area (LSA) and Regional Study Area (RSA). Further, the Board is cognizant of the Proponent's commitment, as indicated in the FEIS and at the Final Hearing, to undertake continued studies and to develop and improve monitoring programs and other initiatives to reduce the impacts of the project on the quantity and flow of water. The Board, however, recognizes that the following issues identified by the Board and intervening parties will require attention:

- Potential impacts to existing watersheds from surface water diversions required by mine site development and other Project components (e.g. waste rock stockpiles) will need to be assessed throughout the life of the project;
- The design construction and modification of culverts along the Railway, access roads and along the Milne tote road will need to satisfy the requirements of the respective regulatory authorities.
- Effluent from project-related facilities and/or activities including sewage treatment plants, ore stockpile, and mine pit, will need to meet the discharge criteria established by the relevant regulatory authority prior to being discharged into the receiving environment.
- Continued and in-depth modelling and analyses will need to be carried out over time to confirm the approximate fill time for the pit lake associated with the proposed mine site.
- Details on selected treatment options for sewage generated at the rail camps, baseline conditions of water bodies to which treated effluent from the rail camps might be discharged, and engineering designs for any proposed treatment systems will be required in advance of construction. Several possible options have been identified for the treatment and/or disposal of sewage generated at the rail camps including backhauling untreated sewage by means of helicopters and trucks for treatment at the Milne Inlet and Steensby Inlet sewage treatment facilities.
- Similar to the information provided for long-term water sources, details with respect to the number, characteristics and approximate locations of potential short-term water sources identified to support a variety of activities, such as, concrete manufacturing and dust suppression will need to be provided to the appropriate regulatory authorities in advance of using these water sources. In addition, the nature of the screening process that will be employed in the selection of short-term sources will need to be provided.

[64] J. Clarke, NRCan, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 847-848, lines 22-26 and lines 1-9.

4.4.4 Conclusions and Recommendations of the Board

To ensure that the potential impacts to flow and quantity of water in the Project area is minimized:

1. The Proponent shall ensure that the water related infrastructure or facilities that are designed and constructed, including the modification of culverts, diversion of watercourses, and diversion of runoff into watercourses along the Railway, access roads, the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied in advance of constructing the facilities.
1. The Proponent shall develop and implement effectives measures to ensure that effluent from project-related facilities and/or activities, including sewage treatment plants, ore stockpiles, and mine pit, satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment.
2. The Proponent shall carry out continued analyses over time to confirm and update, accordingly, the approximate fill time for the mine pit lake identified in the FEIS.
3. The Proponent shall ensure that it develops and implement adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, Baffinland shall monitor, document and report the withdrawal rates for water removed and utilized for all domestic and industrial purposes.

4.5 Groundwater/Surface Waters

4.5.1 Views of the Proponent

Baseline conditions for surface water (lakes, rivers, streams) and groundwater quality and sediment quality within the project area were established from studies conducted as stated in the FEIS, Vol. 7. The potential impacts of the Project on surface water and sediment quality were also determined. Baffinland pointed out that the results demonstrated that surface water in the Project area contains naturally elevated concentrations of dissolved oxygen, turbidity, aluminum, and iron and that the naturally elevated levels of cadmium, mercury and pH in fresh water within the Project area are above the levels set in the Canadian Council of Ministers of the Environment (CCME) water quality guidelines. Analyses related to sensitivity of receiving surface waterbodies indicated that none of the freshwater receiving streams or lakes in the Project area is particularly sensitive to acidic inputs.

The FEIS states that groundwater flow in the Local Study Area (LSA) consists of seepage through unconsolidated materials within the active layer, which typically ranges from 1 to 2 m (up to 3 m) below surface, where it is conveyed to local surface drainages and lakes. The assessment did not consider ground water quality to be generally at risk because the permafrost layer acts as an impermeable barrier eliminating/limiting potential migration of contaminants into ground water.

The following lists the potential impacts of the Project on surface water and sediment quality as identified by Baffinland in the FEIS:

- There is the potential for minor to moderate water quality effects associated with site water management and Project-related ground preparation and earthworks activities. These are only expected to occur during construction and closure phases of the Project. Potential effects are anticipated to coincide with the timing of freshet and effects are expected to be diluted by high flow conditions resulting in TSS concentrations indistinguishable from baseline.
- Minor to moderate water quality effects may be associated with Project-related laydown areas and activities and explosives manufacture, explosives transportation, explosives magazine and explosives use. TSS loading may occasionally exceed the Canadian Council of Ministers of the Environment (CCME) threshold relative to baseline conditions. Ammonia, nitrates, nitrites and petroleum hydrocarbon residues originating from blasting activities in less confined locations may occasionally exceed their respective thresholds in the freshwater receiving environment. These effects, which are limited to summer months when construction and closure activities are scheduled, are most likely to coincide with freshet conditions, which have the potential to mitigate the magnitude of the potential effect.
- Materials from quarries and borrows sources were found to be non-reactive based on representative geochemical testing of materials from quarries and borrows sources. Residues originating from blasting activities as well as sediment-laden water will be confined to the water management infrastructure within each quarry and borrow site.
- Rail line and road construction activities with the potential to affect surface water and sediment quality include culvert installation, bridge construction, infilling of right-of-way through watercourses (encroachment), rail bed construction grading and water management. It is possible that total suspended sediment (TSS) loading may occasionally exceed the Canadian Council of Ministers of the Environment (CCME) threshold relative to baseline conditions. The timing of these effects is most likely to coincide with freshet conditions, when increased flows have the potential to mitigate the magnitude of the potential effect.
- Dust arising from Project activities has been addressed in the Air Quality summary. Dust generation from equipment and vehicle use and subsequent deposition in freshwater receiving bodies will result in minor to moderate adverse residual effects.
- The potential effects associated with camps include changes in water and sediment quality due to water withdrawal (described in Water Quantity-Surface Water hydrology summary), waste management, fuel storage, and discharge of sewage. It is not expected that treated water that is discharged from these activities will exceed Canadian Council of Ministers of the Environment (CCME) thresholds for contaminants.
- Activities at the airstrip including deicing and dust suppression could potentially affect waste and sediment quality. Total suspended sediment (TSS) loading may occasionally exceed the Canadian Council of Ministers of the Environment (CCME) threshold relative to baseline conditions. These exceedances would likely coincide with freshet conditions during snow melt, which is likely to dilute and mitigate any potential effects. Use of propylene glycol as a de-icing agent is anticipated to result in negligible to minor water quality effects.
- Minor exceedances from aqueous point source discharges from mine contact water areas (e.g. open pit, waste stockpiles, ore stockpiles), may occasionally occur due to extreme climatic

events (such as flood conditions). These are not expected to adversely affect water and sediment quality.

- Discharge of exploration drilling effluent into Mary River is required during the construction and operation phases of the Project, and the discharge of treated sewage effluents into fresh water will take place only at the Mine Site for all Project phases, and at Sheardown Lake and the Midrail Camp used during Railway construction. The is not expected to adversely affect water and sediment quality.

To prevent or mitigate the potential impacts of the Project on surface water and sediment quality in the Local Study Area and Regional Study Area, the Proponent has proposed the following measures and monitoring programs as outlined in the FEIS:

- Runoff from the waste rock stockpile and from ore stockpiles will be collected in ponds, to settle out solids and treat the water as necessary to meet Metal Mining Effluent Regulations and water licence requirements before releasing the water to the environment. Runoff from fuel storage and maintenance facility areas will be contained and treated as necessary to meet regulatory requirements.
- Sewage and wastewater from facilities such as camps, truck and rail maintenance facilities, and explosives equipment-washing facilities will be treated to meet established standards before being discharged to the natural environment. An Emergency and Spill Response Plan will be in place to promptly clean up spills should they occur.
- The permanent bulk explosives factories, mixing plants, explosive reagent storage facilities, and truck wash facilities will be constructed to contain any solid explosives or explosives contact water for appropriate treatment prior to discharge to the receiving environment.
- Facilities and quarries sites will be at least 30 m from stream or water bodies to reduce the risk of potential effects of erosion and sediment transport. Similarly, water conveyance features such as culverts and bridges will be removed to restore pre-disturbance drainage patterns.
- The use of non-reactive rock for construction will reduce the potential for acid generation and metals leaching that could affect surface water and sediment quality.
- Detailed rail line design, construction and operation will be completed in compliance with *Fisheries Act* Authorization requirements that are intended to protect water quality as an integral component of fish habitat.

The Proponent has concluded that, with the implementation of monitoring and mitigation, the impact of the Project on surface water (i.e. freshwater) and sediment quality is “not significant”.

The Proponent stated that the concerns expressed by communities generally focused on the potential effects on the aquatic environment of spills, pollution and contamination by the Project.

4.5.2 Views and Concerns of Interested Parties

Fisheries and Ocean Canada (DFO) recommended that Baffinland provide detailed sediment and erosion control plans for the installation of watercourse crossings, water intake structures and lake encroachment areas as well as detailed dewatering and fish removal plans for the installation of the

watercourse crossings, which will occur during the open water season and should include methodology for maintaining flows downstream of dewatered areas. Further DFO recommended that Baffinland develop a monitoring plan that include contingency to ensure that all sediment and erosion control measures are functioning as intended. Baffinland indicated in Exhibit 2[65] that it agrees with DFO's recommendations and pointed out that the plans referred to in DFO's recommendations are a normal part of construction environmental management and would need to be developed in concert with detailed design during the construction stage of the Project.

Fisheries and Ocean Canada (DFO) also recommended that Baffinland should collect adequate baseline data near the construction site before development is undertaken to allow for comparisons with construction and operational phases. Baffinland mentioned in Exhibit 2 that it is unclear as to the specific areas where DFO believes that adequate baseline data is lacking with respect to the construction site; nevertheless, Baffinland committed to the implementation of an appropriate environmental effects monitoring (EEM) program. In some cases, additional baseline is required to serve as a basis for comparison (Before-After EEM design) and Baffinland is committed to gathering such data where appropriate. During the Final Hearing DFO reiterated its position with respect to environmental monitoring of the Project:

> *DFO also recommends that a well-designed, long-term monitoring program be implemented to test impact prediction, evaluate mitigation measures, and improve mitigation processes. While Baffinland has initiated the development of such a program, they have not formally committed to implement proactive mitigation.*[66]

Environment Canada (EC) recommended that regular monitoring should be undertaken in all 5 Local Study Areas to validate the "no significant effects" prediction made in the environmental assessment and that all exceedances of CCME guidelines measured in the receiving environment should be investigated and all trends assessed. In addition, EC recommended that monitoring to verify predictions for non-point source discharges throughout the project area should be conducted in order to determine anticipated Level 2 exceedences and given that the non-point source discharges are anticipated to occur mainly during the construction phase, a construction monitoring program should be undertaken to monitor impacts from non-point source emissions where they are most likely to occur, as well as in sensitive environments where their impacts are more likely to be manifested. In addition, EC recommended that the NIRB should require the proponent to provide a detailed construction monitoring program for further review prior to commencement of construction. Baffinland stated in Exhibit 2 that it intends to address the above-referenced recommendations during the water licence process and in the development of the Aquatic Effects Management Plant (AEMP). During the Final Hearing, EC repeated comments on environmental effects monitoring in its presentation:

> *The proponent's environmental effects monitoring study design framework outlines how Baffinland will meet these requirements. Outside of these requirements, it will be important for Baffinland to conduct regular monitoring of water quality in all five local*

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[65] NIRB Final Hearing File No.: 08MN053, Exhibit 2, "Baffinland Response to Agency Submissions—FEIS, May 30, 2012", dated July 11, 2012, filed by Baffinland, July 16, 2012, Appendix 5: Terrestrial Environment Working Group Terms of Reference, subsequently referred to throughout this Section as simply "Exhibit 2".

[66] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 765, lines 19-23.

study areas during construction in order to validate their predictions of no significant effects.[67]

Further, EC recommended that Baffinland should select defensible reference sites for the freshwater and marine environments at its earliest opportunity and undertake a comprehensive sampling program at these sites in 2012. In doing so, EC indicated that Baffinland should consider the proximity of project infrastructure along with total suspended particulate (TSP) contour plots provided in Volume 5 of the FEIS to ensure sites are not within the mine's zone of influence. Baffinland indicated in its response in Exhibit 2 that it is in agreement with EC's recommendations.

In its final submission, EC stated that the proponent has indicated that it will sample the top 1-2 cm of sediments as recommended by EC. Further, Environment Canada stated that it notes that other northern mines have successfully sampled the top 1 cm of sediments Arctic lakes/streams and that the Proponent should communicate with the consultants who have had success at doing so. Baffinland stated in Exhibit 2 it has been in touch with other consultants and mine operators on this issue.

Environment Canada (EC) also suggested that given the acid sensitivity of some of the river systems along the Railway, Baffinland should consider the lakes/streams in this Local Study Area as sensitive environments and institute a minimum setback of 100 metres from the high water mark for quarries accessed along the Railway that have ARD/ML potential. Baffinland indicates in Exhibit 2 that quarries with ARD potential will not be developed. At the Final Hearing EC restated it position with respect to the sensitivity of streams and lakes with Local Study Area:

Environment Canada disagrees with the generalization that all streams and lakes in the local study area being relatively insensitive to acidic inputs. Given the acidic -- the acid sensitivity of some of the river systems along the Railway, Environment Canada recommended Baffinland consider the lakes and streams in this local study area as sensitive environments and institute a minimum setback of 100 metres from the high water mark for quarries accessed along the Railway that have acid rock drainage potential.[68]

Environment Canada (EC) in another of its recommendations emphasized that the same probability level should be assigned to alpha and beta so the chance of rejecting the null hypothesis when it is true (i.e., false positives) is equivalent to accepting the null hypothesis when it is false (i.e., false negative) and that the Proponent should commit to using one-tailed hypothesis testing for water and sediment quality analyses since one-sided tests are appropriate in this case and would increase the power of the test. In response to EC's recommendations, Baffinland mentioned in Exhibit 2 that its approach is consistent with the Metal Mining Effluent Regulations and that Tailor testing will be used to evaluate concentrations that are higher than the reference.

Natural Resources Canada (NRCan) expressed its satisfaction with Baffinland's responses to comments on the FEIS. However, NRCan noted that given the preliminary nature of the pit water quality estimates, careful consideration will need to be given to the duration of monitoring required after operation of the

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[67] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 724, lines 12-18.

[68] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 723, lines 5-15.

mine ceases and that segregation of waste rock currently termed “deleterious ore” (DO) should be carefully reviewed, and consideration be given to segregation of those materials during operation. NRCan believes it may be prudent to maintain in-pit disposal with an appropriate cover as a possible option among adaptive management measures. Baffinland mentioned in Exhibit 2 that it noted NRCan’s comments and recommendations. NRCan reiterated its position on this issue during its presentation at the Final Hearing

The Qikiqtani Inuit Association (QIA) recommended that Baffinland should measure and report annually the volume of all waste discharged to the environment as well as provide the expected total yearly volume and discharge water quality clearly listed and defined including water that has been in contact with waste rock and ore. Further, QIA recommended that all water that has come into contact with waste at the Mary River and the proposed Steensby Inlet landfills be controlled and only discharged to the environment if the effluent meets discharge criteria. Baffinland in it response provided in Exhibit 2 indicated that the QIA’s recommendations are generally captured in the requirements of a water licence and that the landfills on the Project are designed to be "inert" landfills, which will generate little to no leachate. Although the control of all landfill contact water is not part of the design and is not reasonably required, monitoring will nonetheless be completed and the landfill design, operation and closure will be governed by a water licence.
The Qikiqtani Inuit association (QIA) further recommended that Baffinland should develop defined sampling points and water quality criteria for receiving waters and mixing zones as part of the Aquatic Effects Management Plan (AEMP) and Baffinland should engaged the QIA during the development of the Plan. Moreover, QIA recommended that Baffinland monitor and treat, if necessary, all runoff water effluent from lined laydown, secondary containment areas and landfills to meet discharge criteria prior to release and submit the results of monitoring to interested parties. Under Exhibit 2, Baffinland stated in response that the AEMP will define sampling points and mixing zones and will apply CCME Criteria for the Protection of Freshwater Aquatic Life to the receiving water for comparison purposes. Baffinland also indicated that it intends to engage the QIA on development of the AEMP. Further Baffinland stated that the monitoring of water quality from lined tank farms prior to discharge is a standard practice prescribed by water licences in Nunavut and that such monitoring will also apply to lined landfarms used for managing contaminated soil and water. In addition, Baffinland stated that the landfill seepage will be monitored, but not controlled and treated.

4.5.3 Views of the Board

The Board is aware that proponent is still in the process of capturing data, advancing designs, and confirming possible and/or selected options related to activities and facilities that could potentially impact the quality, flow, and quantity of surface water in the Local Study Area (LSA) and Regional Study Area (RSA). The Board notes that the Proponent has committed, as indicated in the FEIS and at the Final Hearing, to undertake continued baseline studies and monitoring as well as implement preventative and mitigation measure to reduce the potential impacts of the Project.

The Board acknowledges the measures that have been developed and proposed by the Proponent. However, it recognizes that the potential changes in surface water and sediment quality, permafrost/talik distribution, groundwater distribution and flow paths that are directed or indirectly

attributable to the facilities and activities associated with the Project remains a concern for the Board and will need to be assessed and monitored throughout the life of the project.

The Board understands that there are uncertainties at this stage in the process about the short-term water sources that will be used for miscellaneous purposes. As the Project advances, information on the characteristics, number and locations of freshwater sources proposed for use in support of all activities including the manufacturing of concrete for constructing bridges and other water crossings will be required in advance of using those sources. In addition, details on potential treatment options, if any, for wastewater generated from mobile concrete batch plants will need to be provided.

With respect to engineering drawings and design criteria for infrastructure designed to withhold, divert and treat potable water and wastewater and waste, the Board is aware that some of the geotechnical studies and analyses required to advance and fine tune those designs are ongoing and would be required for the regulatory phase of the approval process and in accordance with the requirements of the appropriate regulatory authorities.

The Board believes that the mitigation and management plans developed to mitigate impacts the impact associated with effluent discharged from Project related facilities and activities into the receiving freshwater water environment will need to be assessed throughout the life of the Project and adaptive management strategies implemented as needed.

The Proponent has indicated in response to an Intervenor comment that because of the nature of the landfill and the operational conditions that will be in effect, a site-specific landfill leachate management system will not be required. The Board is of the view, however, that the preparation of a site specific leachate management system for each landfill as a contingency is advisable to address variability in operational conditions that might produce leachate exhibiting characteristics that differ from those assumed under the operation controls predicted in the FEIS.

This issue was not raised by intervening parties; nevertheless, the Board believes that the Proponent needs to provide more details on the procedures that will be develop for the transportation of sewage by means of helicopters as well the proposed access roads (including ice roads) to be constructed to also transport sewage. In addition, specific details on the proposed sewage storage infrastructure at each of the rail camps will be required.

Based on the representations made by several of the interveners in their final written submissions and during their presentations at the Final Hearing, significant concerns were raised about the need for amending the Aquatic Effects Management Plan and undertaking sampling and monitoring to collect adequate baseline data from defensible reference sites prior to and during the commencement of construction activities. The Board agrees and notes that addressing these issues is critical from the perspective of ensuring that adequate data is available to assess impact predictions against actual data about the area's water resources. The Board is also of the view that although the flow of groundwater in the Project area is limited, given the potential for effects and recognizing the Board's precautionary approach where the potential for effects is somewhat uncertain, consideration should be given to developing and implementing a stand-alone, comprehensive Groundwater Monitoring and Management Plan to ensure that any potential impact to groundwater flow and quality is prevented or minimized.

The Board notes that the issue of whether streams and lakes within the LSA are considered as being sensitive to acid inputs remained an unresolved issue at the close of the Final Hearing. The Proponent

stated that its findings suggest that the streams and lakes within in the Project area are not particularly sensitive to acid inputs. Environment Canada, however, believed that the area streams and lake might be sensitive to acid input, and therefore recommended a 100-metre set back from the high water mark for quarries along the Railway with Acid Rock Drainage/Metal Leaching (ARD/ML) potential. Although Baffinland has stated that it does not plan to develop quarries with ARD potential, the Board recognizes that there might be situations where developing quarries with ARD potential becomes inevitable for various reasons, including because ARD/ML material for selected quarry sites might be encounteredafter the quarry has been developed or because the closest available site does contain such material in minute or varying quantities. In support of the precautionary approach espoused by the Proponent, the parties and the Board throughout this Review, the Board recommends that the setback distance recommended by EC be applied where possible for all quarry sites.

4.5.4 Conclusions and Recommendations of the Board

1. The Proponent shall monitor the effects of explosives residue and related by-products from project-related blasting activities as well as develop and implement effective preventative and mitigation measures, including treatment, if necessary, to ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the Project and surrounding areas.
2. The Proponent shall ensure that the scope of the AEMP addresses all relevant aspects of the project as well as the concerns identified by the intervening parties in their final submissions and at the Final Hearing.
3. The Proponent shall develop a detailed sediment and erosion control plan to prevent and/or mitigate sediment loading into surface water within the Project area.
4. The Proponent shall develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and mitigate the potential effects of the Project on groundwater within the Project area.
5. The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carryout treatment if necessary to ensure that discharge conditions are met at all times.

4.6 Landforms, Geology and Geomorphology, Soils and Permafrost

4.6.1 Views of the Proponent

Baseline conditions related to landforms, including geological features, soils and permafrost in the Regional Study Area (RSA) were established from studies carried out, and the anticipated effects of the project on those features were examined by the Proponent as stated in the FEIS. The results show that the topography varies across the Project's Regional Study Area Geology on or near the surface of the area consists of sediments of glacial, river, or marine origin, with occasional outcrops of bedrock and sedimentary rock formations. The thickness of the active layer (upper portion of soil that thaws each summer) varies across the region and is typically between 1 to 2 m thick in the Project area depending

on the local soil cover. Deposit No. 1 is the largest of the five iron deposits defined to date in the Mary River area, with a total strike length of 3,800 m. The soils throughout the Regional Study Area were found to be generally poor in nutrients and permafrost thickness in and around the RSA is deep, typically in the 400 to 700 m depth range. The most common sensitive landforms are thaw-sensitive soils and massive ice deposits.

The Proponent stated that the potential impacts of the project on landform, geological features, soils and permafrost include the following**:**

- Activities such as construction, land clearing, blasting, backfilling, dredging, drilling, excavating, extraction, grading, hauling, transporting, trenching, and waterworks that are required for the development of the Railway, roads, fuel storage and distribution facilities, ore and freight docks, power generation facilities, waste management facilities, ore stockpiles, and aggregate sources will potentially impact sensitive landforms
- Closure activities including dismantling and removal of infrastructure, demolition, drainage and ground restoration, excavation, backfilling/plugging, waste management, open pit closure, waste rock storage facility restoration, and revegetation will have impacts on sensitive landforms.
- Soil destabilization and erosion are potential effects in all areas where the naturally occurring topography and soils are altered as a result of Project implementation. Soil destabilization and erosion effects are expected to be minor.
- No major eskers (a long, narrow ridge of coarse gravel deposited by a stream flowing in or under a decaying glacial ice sheet) or wetlands within the Local Study Area will be affected by the Project
- The Project infrastructure, dust generated, and noise will be the main project components and activities that will affect aesthetics during the life of the Project.

To reduce the potential effects of the Project, the Proponent has proposed the following monitoring and mitigation measures for implementation:

- Geotechnical investigations will continue to be carried out to avoid, where possible, locating Project activities and infrastructure on sensitive landforms.
- Foundations will be designed to protect the underlying permafrost from degradation due to construction and to adjust to any changes caused by climate change.
- Stream crossing structures will be designed to accommodate extreme flooding events.
- Drainage systems will be designed to provide adequate drainage and prevent ponding of water.
- The Project sites will be built in a manner that does not disturb sensitive landforms outside the Potential Development Area (PDA).
- Permafrost protection measures for the waste stockpiles will be designed for potential effects of climate changes.
- Waste stockpile slopes will be monitored on an ongoing basis during operations. Any cracks that develop will be monitored and repaired as required to minimize inflow of surface water and ice wedge formation within the stockpiles.
- Best Management Practices will be used for sedimentation and erosion control.

- A sediment control monitoring program will be implemented to detect potential issues arising from soil destabilization and erosion and assess whether these changes are naturally occurring variations (e.g., suspended sediment increases during spring thaw) or Project-related effects.

The Proponent stated that key issues raised by community members had to do impacts of the Project on vegetation. In conclusion, the Proponent stated that it is highly confident that with mitigation, the Project will not have a significant effect on sensitive landforms.

4.6.2 Views and Concerns of Interested Parties

The Canadian Transport Agency (CTA) stated in its final written submissions that it may take some time after construction and following the commencement of operations before any permafrost ground stability problems develop; however, regular inspections will allow for the Proponent to detect and correct any stability issues with the potential to impact the safety of the trains. Further, CTA stated that Transport Canada Rail Safety Rules prescribe the minimum frequency of track inspections and that Baffinland has agreed to install equipment to monitor the permafrost in a certain number of criteria locations along the Railway line.

Natural Resources Canada (NRCan) in it comments stated that it considered the information currently provided in the FEIS adequate to cover its recommendations, but it remained available, as needed, to provide advice on remote sensing to determine the extents of bottom-fast ice, and potential existence of subsea permafrost in Milne and Steensby Inlets. NRCan also identified that it may be able to provide continued advice on potential GIS-based investigation of the historical aerial photography and contemporary satellite data record to quantify past rates of change at the Milne and Steensby Port sites. Baffinland in its response provided in Exhibit 2[69] stated that it notes NRCan's comments.

Natural Resources Canada (NRCan) also noted that in areas where the track will be built over the active layer, settlement of the track could occur over a certain length which would result in the RRailway becoming out of line, both on the longitudinal and the transversal planes. NRCan mentioned that information on stability analysis, particularly creep analysis for the Railway embankments and an approach to be taken to limit the impacts on sensitive landforms has been provided. Baffinland in its response provided in Exhibit 2 stated that it notes NRCan's comment. In its presentation at the Final Hearing NRCan stated that there is a need to conduct additional analyses to determine impacts to landforms, soil and permafrost:

> *In NRCan's technical review of the draft environmental impact statement, we had recommended that the proponent complete additional analyses to demonstrate the impacts on soils, land forms, and permafrost would be minimized along the Railway corridor. Natural Resources Canada also recommended that the proponent commit to complete additional geotechnical investigations and provide information on how the*

[69] NIRB Final Hearing File No.: 08MN053, Exhibit 2, "Baffinland Response to Agency Submissions—FEIS, May 30, 2012", dated July 11, 2012, filed by Baffinland, July 16, 2012, Appendix 5: Terrestrial Environment Working Group Terms of Reference, subsequently referred to throughout this Section as simply "Exhibit 2".

design of the Railway structures, like bridges and culverts, consider slope and stability hazards.[70]

Natural Resources Canada further stated that the FEIS provided improvements to the quality of information (as opposed to the Draft Environmental Impact Statement) in relation to the design approach and the additional analysis and geotechnical investigations required to support detailed and final design. NRCan stated that if the commitments made by the Proponent to undertake additional work during the detailed design are implemented, as suggested, NRCan considered the information currently provided in the FEIS adequate to address their recommendations. At the Final Hearing, NRCan repeated in its presentation that the FEIS identified the Proponent will continue its geotechnical and geophysical survey program and additional analyses to support detailed and final design.[71]

4.6.3 Views of the Board

The proposed preventative and mitigation measures identified by the Proponent for minimizing the impacts to sensitive landforms, geological features, soils and permafrost are, in the Boards view', satisfactory at this stage of the development process. The Board advises that the follow-up and complementary initiatives communicated by the Proponent in the FEIS and at the Final Hearing are critical in ensuring that the measures proposed are, and will continue to be, effective in achieving the desired objectives and adequately address concerns related to sensitive landforms, geological features, soil and permafrost.

The Proponent should be aware that the Board has concerns about the potential negative impacts that the Railway infrastructure and other facilities could have on the integrity of the permafrost within the Project area. The Board believes that the implications for the Project planning and design process will need to be identified and assessed once new and updated information related to terrain conditions, in particular, permafrost, sensitive landforms, high ice-content soils, ice lenses, thaw-sensitive slopes, and talik zones becomes available. In addition, consideration should always be given to maintenance and monitoring measures to ensure that adaptive management strategies are effective and potential effects on the receiveing environment are minimized.

Given that the scope of the Project is unprecedented for the area, the Board believes that the potential impacts on the abundance and distribution of unique or valuable landforms (e.g., wetlands, eskers and fragile landscapes), as well as on the aesthetics, i.e. the beauty of the natural topography and landscape, as perceived by Inuit proximal to the Project area, deserves consideration throughout the life of the Project.

The Board is also of the view, as discussed more fully in Section 4.11 of the report in relation to the Marine Environment that there is potential for shoreline erosion resulting from wake effects and increased open water due to ice breaking activities along proposed shipping routes. In addition, the

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[70] J. Clark, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 846, lines 14-24.

[71] J. Clarke, NRCan, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 847, lines 2-6.

potential for soil erosion, including stream bank erosion, associated with surface disturbances during the construction, operation and closure phases of the Project is reasonably high.

The Board believes that the results and implications of initiatives planned by the Proponent, including further sampling and analyses to characterize Potential Acid Generating (PAG) materials, geotechnical analyses targeting the proposed open pit and waste rock dump and other Project areas or infrastructure sites, and thermal modeling of storm-water ponds adjacent to the waste rock dump and the RRailway will have significant implications for the Project.

4.6.4 Conclusions and Recommendations of the Board

1. The Proponent shall carry out continued geotechnical investigation to assist in identifying sensitive landforms, advance engineering design for Project infrastructure, and develop mitigation and monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.
2. The Proponent shall develop and implement a comprehensive erosion management plan to prevent or minimize the effects of destabilization and erosion that may occur due to the Project's construction and operation.
3. The Proponent shall include within its public consultation report information related to the sentiments expressed by affected communities about the impacts that changes to the topography and landscape have had on the aesthetic value of the Project area.
4. The Proponent shall monitor the effects of the Project on the permafrost integrity along the railway and other relevent Project areas and implement preventative measures to ensure that the integrity of the permafrost is maintained.
5. The Proponent shall provide to the respective regulatory authorities, for review and acceptance, for-construction engineering design and drawings, specifications and engineering analysis to support design in advance for constructing those facilities. Once project facilities are constructed, the Proponent shall provide copies of the as-built drawings and design to the appropriate regulatory authorities.
6. The Proponent shall develop site-specific quarry operation and management plans in advance of the development of any potential quarry site or borrow pit.

4.7 Vegetation

4.7.1 Views of the Proponent

During Project construction and operation the key components reviewed to assess the potential effects on vegetation included: the loss of abundance and diversity due to surface disturbance associated with Project activities; potential effects on abundance, diversity and quality of vegetation as forage associated with airborne dust; loss of abundance and diversity due to the introduction or transfer of invasive or exotic species from project vehicles, ships and aircraft; potential for effects on vegetation of cultural or practical value to Inuit and monitoring of effects on vegetation used directly as a human food source or indirectly as part of the food chain. This component of the FEIS also considered management measures intended to limit disturbances to existing plant associations, including progressive reclamation and revegetation of disturbed areas.

As outlined in the FEIS, Volume 6, Section 3, Baffinland indicated that its study of the abundance, diversity, health and uses of vegetation in the Regional Study Area (RSA) was conducted over the course of four summer seasons, and identified that there were no rare or endangered plants in the RSA, however, an unusual plant association was found and Baffinland proposed that area for special protection as a result. A total of 155 vascular plant species were recorded in the RSA and ten different types of plant communities were identified. Inuit Qaujimajatuqangit (IQ), studies were carried out with Elders in Pond Inlet to build an understanding of the traditional use of plants by local Inuit. On this basis, Baffinland indicated that the plant species that are most commonly used by Inuit include blueberries, crowberries and mountain sorrel. Metals analysis of samples of surface soil and plant foliage from 56 baseline stations in the Local Study Area was conducted to establish a baseline of metal concentrations in plants and soil.

Baffinland identified the following potential effects from the Project on vegetation abundance, diversity and health:

- Vegetation abundance and diversity will be reduced in the Project`s Potential Development Area (PDA), or footprint, where the ground will be used to build and operate the Project. However, the predicted loss of the terrestrial habitat within and outside the Potential Development Area (PDA) is estimated to be a very small (0.36%) portion of the Regional Study Area (RSA).
- Dust released into the area will affect an area larger than what is disturbed to build the Project, however no vegetation classes sensitive to dust deposition are predicted to be adversely affected by dust outside of the PDA.
- Dust released during the Project activities will contain metals. Although accumulation of metals in the soils at the mine site and port site may occur as a result of dust deposition, the effects on vegetation (including blueberries) and on the caribou feeding on this vegetation are not expected to be signficantly affected by the low levels of metal contained in the dust.
- Any predicted effects on the health of vegetation caused by dust are mainly reversible when dust-producing activities end.
- Similar to dust, nitrogen dioxide emissions from combustion sources (i.e., power generators) will affect an area outside the PDA, however, no vegetation classes are predicted to be adversely affected by the nitrogen dioxide emissions outside the PDA and nitrogen deposition is not predicted to exceed estimated acceptable levels outside of the PDA.
- The reduction in blueberry cover is expected to be minor compared to baseline conditions at the scale of the RSA. New disturbances to blueberry cover will occur along the Railway and at Steensby Port. However, Baffinland asserts that these effects, in the context of the terrestrial Regional Study Area (RSA), will not be significant.

On the basis of the potential for these effects, the Proponent has proposed the following monitoring and mitigation measure to minimize the potential impacts of the Project:

- Project activities will be planned and conducted to minimize the Project footprint.
- Project vehicles will stay on the established roads within the Potential Development Area (PDA) during operation, limiting new disturbance.
- Revegetation of the terrestrial habitat will be allowed to occur naturally. The mitigation will reduce the likelihood of invasive plant species getting established within the RSA due to project development activities.
- Equipment brought to the Project site will be cleaned of soils that could contain plant seeds that do not naturally occur in the RSA. This will reduce the likelihood of invasive plant species getting established within the RSA due to Project development activities.
- Mitigation of dust effects on vegetation will be addressed by those measures used to mitigate effects on air quality.
- Vegetation health will be monitored during the life of the Project.
- Relevant Monitoring and Management Plans will be included under Baffinland's Environmental Management System, Terrestrial Environment Management and Monitoring Plan (TEMMP).

In addition to mitigation measures during operations, Baffinland intends to implement a site reclamation plan that includes undertaking progressive reclamation to reduce environmental risk and advance environmental protection and that promotes natural revegetation and recovery of disturbed areas that is compatible with the surrounding natural environment.

In its assessment, Baffinland also noted that climate change is expected to result in changes to vegetation communities in the Arctic, with an overall increase in biomass and plant diversity, with a tendency for high Arctic polar deserts to become tundra and for tundra to become more like boreal forest.[72]

Baffinland expects mosses and lichens, for example, to generally decline as warming increases. It is likely that climate change effects to vegetation will be slower to occur than Project-related effects and visible changes may occur beyond the temporal boundaries selected for the assessment (i.e., the next 35 years, up to 2045). As the terrestrial RSA is located on an island and not the mainland Arctic, it represents a physical barrier to transport of seeds and it is likely that the predicted changes will occur more slowly than in other Arctic locations. Based on this, it is predicted that vegetation changes resulting from climate change will be relatively modest over the assessed time period and the cumulative effects on vegetation abundance and diversity due to the above projects/activities will remain indistinguishable and insignificant.

[72] Arctic Council and the International Arctic Science Committee. 2005. Arctic Climate Impact Assessment Available at: http://www.acia.uaf.edu/ as cited by Baffinland in the FEIS, Vol. 6, Section 3.

4.7.2 Views and Concerns of Interested Parties

With respect to potential effects on abundance and diversity related to the footprint of activities during project construction, the Canadian Transportation Agency (CTA) recommended that consideration be given to the feasibility of locating the construction staging areas and temporary work camps at the site of the planned Railway sidings so as to limit the areas of disturbance to vegetation.

The views of the parties with respect to monitoring for these effects included the following:

- The Nunavut Research Institute (NRI) recommended that the Project Certificate include a term and condition that Baffinland develop and share with the NRI and the Government of Nunavut - Department of Environment (GN-DOE) a plan for coordinated, consistent Inuit involvement in project monitoring programs for key valued ecosytemic components (VECs) and indicators (including vegetation);[73]
- GN-DOE indicated it would support a Project Certificate term requiring Baffinland to monitor for invasive species and promptly report any introductions to the GN-DOE to ensure compliance with the provisions of the Wildlife Act;
- The Qikiqtani Inuit Association suggested Baffinland conduct an environmental baseline monitoring program for selected vegetation species (such as lichens) prior to commencing operations (baseline) near the various Potential Development Areas, with subsequent periodic monitoring during operations, to reduce uncertainty as to whether caribou forage quality will be affected by the Project; and
- Health Canada indicated its support for the monitoring activities recommended in the FEIS, Vol. 6, Appendix 6G (page 24), and in particular, monitoring for baseline metal levels in soils in areas where blueberries or other vegetation may be harvested gnear any of the Potential Development Areas; and establishing baseline metal levels in caribou organ meats in local study areas (prior to commencing operations).

With respect to minimizing effects during reclamation, Aboriginal Affairs and Northern Development Canada (AANDC) requested that the vegetation monitoring plan and closure and reclamation plan be revised with future versions describing any test plot activity included in the plans, and further, that the Proponent incorporate test plot results into future developments of the re-vegetation strategy. In addition, GN-DOE suggested that the Project Certificate should include a requirement that Baffinland conduct progressive rehabilitation studies and share the results through NIRB's Annual Report process and any requirements under the Nunavut's Wildlife Act and Scientists Act with respect to reporting to the Nunavut Research Institute and GN-DOE.

With respect to adaptive management planning, the GN-DOE also recommended that the Project Certificate include Terms and Conditions requiring Baffinland to develop an adaptive management plan

[73] NRI indicates that key elements of this plan should address: Inuit involvement in monitoring design; Inuit training and engagement in data collection; methods for engaging Inuit in analysis and interpretation of monitoring data, including the determination of effects; the process for evaluating the effectiveness of Inuit engagement efforts, and for improving engagement practices where necessary; and reporting of monitoring results to Inuit communities.

(to be approved by GN-DOE) to comply with section 91(2) of the *Wildlife Act,* which states "No person shall release a member of a species into a habitat in which that species does not belong or never naturally occurred" and also requiring Baffinland's adaptive management plan to incorporate measures for site rehabilitation assessment for re-seeding and the (re)planting of native plants as part of the progressive rehabilitation program. GN-DOE also indicated that any seeding and (re)planting undertaken by Baffinland should emphasize the characteristics of existing, naturally-occurring vegetation communities and culturally-valued plants.

4.7.3 Views of the Board

The Board recognizes that although Baffinland conducted surveys and testing over the course of four summer seasons, considerable uncertainty remains because there is limited baseline data available regarding several valued ecosystemic components in the Baffin Region, including vegetation. There are currently limited examples of similar projects and/or operations in similar settings to compare to the Project. As a result, the confidence levels of predictions made in the FEIS regarding project impact significance may be reduced. As noted by many parties in the process of this Review, this situation emphasizes the need for Baffinland to continue in its efforts to collect additional baseline information throughout the project phases, particularly prior to and during the construction phase, to generate a more accurate picture of present conditions in the project area and the region and provide an early indication of the extent to which actual effects reflect the effect predictions in the FEIS.

4.7.4 Conclusions and Recommendations of the Board

On this basis, the Board's recommendations and suggested Project Certificate terms and conditions are designed to continue the development of baseline, to establish mechanisms for early and effective monitoring (including third party monitoring) and to support adaptive management to respond to the potential for the following project effects on vegetation:

- A loss of vegetation in the Project Development Area (PDA);
- Introduction of invasive plant species;
- A reduction in plant health and the quality of forage plants (due mainly to deposition of dust) within the local study area (Local Study Area);
- A loss of or decline in the quality of culturally valued vegetation, such as blueberry, within the PDA.

Construction and Operations

1. The Proponent shall ensure that Project activities are planned and conducted in such a way as to minimize the Project footprint.
2. The Proponent shall ensure that equipment and supplies brought to the Project sites are clean and free of soils that could contain plant seeds not naturally occurring in the area. Vehicle tires and treads in particular must be inspected prior to initial use in Project areas.

Monitoring

3. The Proponent shall include appropriate vegetation mitigation and management plans within its Environmental Management System, Terrestrial Environment Management and Monitoring Plan (TEMMP).
4. The Proponent shall conduct soil sampling to determine metal levels of soils in areas with berry-producing plants near any of the potential development areas, prior to commencing operations.
5. The Proponent shall undertake monitoring of baseline metal levels in organ tissue from caribou harvested within the local study area, prior to commencing operations. The proponent is strongly encouraged to coordinate with local Hunters and Trappers Organizations regarding procurement of harvested caribou organs.
6. The Proponent shall establish an on-going monitoring program for vegetation species used as caribou forage (such as lichens) near Project development areas, prior to commencing operations.
7. The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. Any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.

Adaptive Management

8. The Proponent shall review, on an annual basis, all monitoring information and the vegetation mitigation and management plans developed under its Environmental Management System, Terrestrial Environment and Monitoring Plan (TEMMP) and adjust such plans as may be required to effectively prevent or reduce the potential for significant adverse project effects on vegetation abundance, diversity and health.

Reclamation and Revegetation

9. Prior to operations commencing, The Proponent shall develop a progressive revegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test plots, reseeding and replanting of native plants as necessary. It is further recommended that this program be directly associated with the management plans for erosion control established for the Project.
10. The Proponent shall include revegetation strategies in its Site Reclamation Plan that support progressive reclamation and that promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment.

4.8 Freshwater Aquatic Environment Including Biota and Habitat

4.8.1 Views of the Proponent

Studies to establish Baseline conditions for freshwater biota and habitat in the Regional Study Area (RSA) were carried out, and the anticipated effects of the Project on arctic char, other biota and aquatic habitat were determined as mentioned in the FEIS. The result of the studies show that arctic char and ninespine stickleback were the only species of fish found in water bodies; landlocked arctic char were widely distributed and found in waterbodies along the Milne Inlet Tote Road, at the mine site, along the

Railway, and at Steensby; and sea-run arctic char were located in freshwater system at Milne Port and Steensby Port and in the Cockburn River System.

The Proponent has identified the potential impacts that the Project could have on freshwater biota and habitat which include the following:

- The potential for the Project to cause direct mortality of arctic char (e.g., due to blasting or egg stranding) is expected to be avoided with mitigation measures in place.
- Some habitat change or loss will result from alterations in flows resulting from water diversions. For example, the diversion of water around the waste rock stockpile may result in an 18% reduction in flows to one Sheardown Lake tributary. The effect is not expected to be significant but will be monitored to ensure changes are not detrimental to juvenile arctic char.
- Direct habitat loss will also occur in streams and lakes from installation of physical footprints, including water intakes, wastewater outfalls, culverts, and bridges, and embankments. These losses will be relatively small.
- Indirect habitat changes and potential loss of productivity can result from activities that affect water quality either in arctic char habitat or in headwaters that drain to arctic char habitat. These activities include discharge of effluents, such as treated sewage effluent from the Mine Site and stockpile runoff, introduction of dust, runoff from work areas and infrastructure, blasting, and other non-point sources. Increased sedimentation due to dust deposition or erosion can have an effect on fish habitat or the health and survival of fish eggs. These potential effects are not expected to be significant.

To prevent or mitigate the effects of the Project on freshwater biota and habitat in the Local Study Area and Regional Study Area, the Proponent has developed for implementation the following measure as outlined in the FEIS:

- A number of proven mitigation measures have been included in the Project to reduce potential effects on water quality, freshwater fish, fish habitat, and other aquatic organisms. These mitigations are detailed in the Site Water Management Plan, Wastewater Management Plan, Waste Management Plan and Emergency and Spill Response Plan.
- Baffinland is responsible to provide compensation under the *Fisheries Act* in the event of any identified Harmful Alteration, Disruption orDestruction (HADD) of fish habitat (addressed in the Fish Habitat Compensation Plan).
- Explosives will be required for rock cuts and tunneling along the Railway alignment and also for quarrying operations. The *Fisheries Act* and Fisheries and Oceans Canada (DFO) guidelines provide directives to protect fish and fish habitat. These guidelines and directives will be complied with by using alternative explosives and blast designs or excavation methods during construction in or near water at locations that will include Steensby Inlet Port, and the RailwayRailway (Cockburn Lake). In circumstances where Fisheries and Oceans Canada (DFO) guidelines cannot be met or where there is the potential for Harmful Alteration, Disruption, or Destruction (HADD) of fish habitat, Baffinland will work proactively with Fisheries and Oceans Canada (DFO) representatives.
- Detonation of explosives in or near water can be harmful to fish. To prevent or minimize these effects on fish and in accordance with the *Fisheries Act* and Guidelines, Baffinland and its contractors will identify possible alternatives to the use of explosives in or near water

throughout the Project. Less destructive methods of breaking rock or excavating will be used wherever possible.

- In all phases of the Project, Baffinland will adhere to the No Net Loss principle to prevent or mitigate losses of fish or fish habitat. Habitat compensation will be the measure of last resort only where loses are unavoidable by redesign and mitigation methods. Habitat compensation will be undertaken in consultation with Fisheries and Oceans Canada (DFO) through habitat replacement or enhancement.
- Other examples of mitigation measures include:
    a. Runoff from fuel storage and maintenance facility areas will be contained and treated as necessary to meet regulatory requirements.
    b. Sewage and wastewater from truck and rail maintenance facilities, and explosives equipment-washing facilities will be treated to meet established standards before being discharged to the natural environment. An Emergency and Spill Response Plan will be in place to promptly clean up spills should they occur.
    c. The roads and Railway both cross a large number of watercourses, and a portion of these contain fish habitat. Culverts and bridges for stream and river crossings will be designed to limit barriers to fish movement and where possible, minimum flows will be maintained in streams important for fish habitat.
    d. Since Railways cannot turn sharp corners, building sections of the RailwayRailway into the edge of several lakes will be unavoidable. While some fish habitat will inevitably be lost, a compensation plan has been proposed to offset this unavoidable loss. This plan will be further developed and finalized in consultation with Fisheries and Oceans Canada and the Qikiqtani Inuit Association.

The Proponent has concluded that with the proposed monitoring and mitigation, the Project will not have significant adverse effects on aquatic ecosystems, freshwater fish and fish habitat including arctic char. The effects on arctic char and their habitat will be monitored and any effects are expected to be reversible upon closure of the mine**.**

The proponent mentioned that communities proximal to the affected areas have raised concerns about the potential effects of the project on fish in the Regional Study Area.

4.8.2 Views and Concerns of Interested Parties

Fisheries and Ocean Canada Fisheries and Oceans Canada (DFO) recommended that the proponent should provide more detailed information related to the criteria which was used in Table 7.4-10 –"Fish Passage Determination Matrix for Railway and Access Road Culvert Crossings of Streams with Juvenile Arctic Char"; developed monitoring program, which includes a contingency plan, to determine if the mitigation measures installed to facilitate fish passage are functioning as intended; provide stream crossing design criteria, final crossing designs and site specific mitigation measures to DFO for review upon completion of the detailed engineering phase and a detailed closure plan for the decommissioning of all watercourse crossings. In response, Baffinland stated in Exhibit 2 that it agrees with and notes that above-referenced recommendations are within DFO's process for issuance of a Fisheries Act Authorization, which is being addressed directly between Baffinland and DFO. During the Final Hearing,

DFO reemphasized its recommendation that proven methods of determining fish passage be used by Baffinland and that detailed design, monitoring, and contingency plans should be provided to DFO during the regulatory process to ensure that fish passage is maintained where necessary at water crossings for the Project.[74]

Another of DFO's recommendations focuses on the detailed blasting program, mitigation and monitoring plan that should be developed in consultation with DFO during the regulatory phase, using the 50 kPa threshold. In response Baffinland mentioned in Exhibit 2 that it will comply with published DFO guidelines, which currently has a 100 kPa threshold and that while the current guideline is 100 kPa, Baffinland recommends that this item be resolved between DFO and Baffinland, taking into account mitigation measures such as bubble curtains.

At the Final Hearing DFO reemphasized its position on the threshold for blasting:

> *The research conducted by Fisheries and Oceans Canada has shown that a threshold value of 100 kilopascals is not likely productive in Arctic conditions under frozen ice, and we have recommended that a threshold of 50 kilopascals be used for this project, as was done in other projects in the Arctic, such as Meadowbank, Jericho, and Doris North. We note that Baffinland has changed their blasting operations in the marine environment, so that is being completed during the open water season, and as such, the national guidelines would apply.*[75]

During the Final Hearing, Baffinland question DFO on how the apparent disagreement with regards to the threshold for blasting could be resolved.[76] In response, DFO stated that discussion could be conducted during the regulatory stage on mitigation plans that could be develop and would be supported by further detailed on how blasting would occur and that those mitigation plans would need to consider a different threshold that would be appropriate from the circumstances.[77]

Qikiqtani Inuit Association (QIA) recommended that Baffinland comply with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by the DFO for use in the north (i.e. 50 kPa threshold for instantaneous pressure change). Under Exhibit 2, Baffinland indicated that it will comply with published DFO guidance, which is currently 100 kPa threshold.

During the Final Hearing, the QIA restated its position on the issue of threshold for blasting in its presentation:

> *QIA has consistently requested Baffinland consider using a more conservative threshold of 50 kilopascals. QIA would like to confirm with Baffinland whether the operational constrains associated with applying a more stringent guideline is a topic that can be*

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[74] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 752, lines 14-20.
[75] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 752-753, lines 24-26 and lines 1-8.
[76] B. Armstrong, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 772-773, lines 18-26 and line 1.
[77] D. Moggy, DFO NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 773, lines 4-10.

discussed within the marine environment working group. QIA also requests of DFO to comment on the likelihood of a change in the official guidelines from 100 to 50 kilopascals.[78]

The QIA stated in response that it was not expecting the NIRB to effectively amend the guidelines. Moreover, the QIA noted that it had raised the issue concerning the guidelines for the use of explosives when the Draft EIS was released and was recommending a more precautionary approach to developing project-specific thresholds.[79]

Another of DFO's recommendations stated that Baffinland should continue to explore off-setting options in both the freshwater and marine environment to offset the HADD incorporates community consultation, develop a monitoring plan and ensure that sufficient baseline data is collected to determine if the new fish habitat is stable and functioning as intended and a contingency plan if the construction and implementation of the chosen fish habitat off-setting options is not successful and does not function as intended. In response to DFO, Baffinland stated in Exhibit 2 that it agrees with recommendations and that separate from the NIRB environmental assessment process, work and discussion have been ongoing with DFO towards receipt of a Fishery Act Authorization that would be issued by the DFO.

Further, Fisheries and Ocean Canada (DFO) asserted that the offsetting options in Baffinland's no net loss plan in the FEIS are not suitable and recommended that these options be pursued further; however, DFO stated that most of the other conceptual options identified in the plan are feasible and require further detailed information before DFO can issue authorization.[80]

The Qikiqtani Inuit association stated that scientific rationale for the biological appropriateness of thresholds selected should have been provided and incorporated into the FEIS to inform the impact assessment, impact review, mitigation, and monitoring. The QIA recommended following:

1. Impact assessment, mitigation, and monitoring thresholds are to be updated with any new information prior to construction. Monitoring and thresholds shall be, where applicable, and not limited to, being ecologically appropriate. Details shall be refined through establishment of a Marine Environment Working Group.
2. Results from monitoring shall be analyzed to include, but not be limited to, the ecological and biological context to ensure impacts are not missed and/or allowed to cause irreversible harm to populations.

In response to the QIA's recommendation no. 1, Baffinland stated in Exhibit *2*, that the monitoring plans include a provision confirming that they will be updated as required. For recommendation no. 2 Baffinland stated that the approach recommended is consistent with the Baffinland monitoring plans and in response to recommendation no. 3, Baffinland stated that it will comply with published DFO guidance, which is currently 100 kPa threshold. During the final hearing the QIA restated its position on the issue of threshold for blasting.

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[78] S. Williamson Bathory, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 496, lines 11-19.
[79] S. W. Bathory, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp. 511-512, line 21-26, 1-9.
[80] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 768, lines 7-12.

4.8.3 Views of the Board

With respect to the freshwater aquatic habitat environment, the Board examined the information provided in the FEIS by the Proponent and noted the representations made by intervening parties in their final submissions and presentations during the Final Hearing, and determined that from a general perspective, most of the relevant issues have been adequately addressed for this stage of assessment, recognizing that water licensing provides more in-depth consideration of certain relevant topics. The Board is aware that there are a number of issues such as offsets associated with Habitat Alteration, Disruption or Destruction and thresholds for blasting that are will also require further consideration and approval by the respective regulatory authorities.

The Board agrees that continued assessment of the potential and direct impacts of the Project on the mortality of arctic char and other freshwater organism will need to be conducted throughout the life of the Project. Adequate continual monitoring and adaptive management strategies will need to be instituted to ensure that the potential impacts to the freshwater aquatic environment is prevented or minimized. Adequate compensation to affected communities may need to be determined for fish mortalities directly or indirectly attributable to the Project

Appropriate regulatory approvals will be required to support real and potential changes to habitat or the loss of habitat resulting from the alterations and disruption in the flow of water.

Climate change may have direct and indirect effects on freshwater biota in local and regioanl areas associated with the Project through changes in air temperatures, precipitation and ultraviolet radiation. Climate change effects on aquatic biota will also be mediated through changes to hydrology and water quality. The cumulative effects of the Project and climate change on arctic char and freshwater biota in general are inherently difficult to predict and associated with high uncertainty. The Arctic Climate Impact Assessment predicts that increasing water temperatures are likely to result in an increase in food chain productivity that will likely result in an increase in growth rates of arctic char (Arctic Council and the International Arctic Science Committee, 2005). It is possible that climate change could also result in adverse effects such as an increase in the accumulation of metals in fish tissue due to a higher respiration rate associated with warmer water (lower in dissolved oxygen). These two competing effects of climate change on are not expected to cumulatively affect arctic char in a meaningful way, although there is a high degree of uncertainty in the predicted effects of climate change.

4.8.4 Conclusions and Recommendations of the Board

1. The Proponent shall maintain a minimum 100-metre naturally-vegetated buffer between the high-water mark of any fish-bearing water bodies and any permanent infrastructure.
2. The Proponent shall maintain minimum a 30-metre naturally-vegetated buffer between the mining operation and adjacent water bodies.
3. Prior to the start of construction, the Proponent must submit a Site Drainage and Silt Control Plan to the appropriate regulatory authorities for approval.

4. The Proponent shall meet or exceed the guidelines set by Fisheries and Oceans Canada for blasting thresholds and implement practical and effective measures to ensure that residue and by-products of blasting do not negatively affect fish and fish habitat.
5. The Proponent shall adhere to the No-Net-Loss principle at all phases of the project to prevent or mitigate direct or indirect fish and fish habitat losses.
6. The Proponent shall ensure that runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities responsible for generating liquid effluent and runoff meet discharge requirements.
7. The Proponent shall ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and limit the movement of water in fish bearing streams and rivers.
8. The Proponent shall engage with Fisheries and Oceans Canada and the Qikiqtani Inuit Association to explore possible Project specific thresholds for blasting that would exceed the requirements of Fisheries and Oceans Canada's *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (*D.G. Wright and G.E. Hopky, 1998).

4.9 Terrestrial Wildlife and Habitat

4.9.1 Views of the Proponent

In the FEIS, Vol. 6, Section 5, Baffinland indicated that the terrestrial wildlife in the project area are relatively sparse and include caribou, wolves, foxes, Arctic hares, ermine, and small mammals. As caribou have such significance to Inuit culture and are an important component of the subsistence lifestyle of adjacent communities, caribou were chosen as the indicator species for this component of the assessment. Baffinland concedes that although wolves and foxes are the dominant carnivores in the area, very limited information was available and could be collected on these species because they were so rarely observed.

In reviewing the assessment of this Valued Ecosystemic Component, it is important to recognize that the North Baffin Island caribou currently occur at low densities and their abundance seems to be cyclical (on the basis of harvest data and Inuit Qaujimaningit it appears that the caribou are at the low end of an approximately 70-year cycle of abundance). The causes for this cyclical variation are unknown, but the pattern is similar to that observed in Greenland and south Baffin Island. Given that the last period of caribou abundance in the Regional Study Area (RSA) was approximately 1980 to 2000. There is an expectation that caribou numbers will gradually increase in the Project area, over time, but full recovery to historical highs may not occur for many more years to come (possibly not until the 2050s). Although the density of caribou is currently low, caribou do occur throughout the entire region and therefore use most of the area in the RSA as some form of habitat, with the greatest use in the southern and central portion of the RSA.

The focus of Baffinland's assessment of this component was on predicting project effects related to habitat loss within the project footprint, increasing the degree of sensory disturbances such as that created by noise and traffic, possibly changing movement patterns of some caribou as they perceive

physical and sensory barriers to movement, and possibly reducing the health of local animals. In addition, the EIS Guidelines required Baffinland to assess the likelihood of effects associated with injury or mortality caused by Project activities, particularly the use of the Milne Inlet Tote Road, the Railway, mine hauling roads and other access roads, or killing of wildlife to defend human life or property by mine personnel, the potential for Project activities to act as an attractant to wildlife species, and associated effects or changes to behaviour and condition of wildlife as a result.

Although the Proponent notes that numerous studies have been undertaken to assess the effects of industrial activity on migratory caribou range use, Baffinland states that the conclusions from these studies vary and the differences are likely related to factors which are herd or even location specific. As a result, the predictive power of such general studies to anticipate the specific effects of a given project on a herd uniquely adapted for a given ecosystem may be quite limited.

Baffinland identified that the present population of caribou within the RSA are not migratory, with very limited and few focused directional movements, staying largely within the area within which they were collared. However, Baffinland indicated that as the caribou populations return to the peak numbers observed during 1980-2000, migratory movements are likely (as migratory behaviour was observed during that time). Based on a review of Inuit Qaujimajatuqangit (IQ) and observations of existing caribou trail orientation and abundance, it is anticipated that migratory movements would predominantly be east-west and will occur in the southern half of the Regional Study Area (RSA).

With respect to habitat loss, Baffinland predicted that there will be direct habitat loss for caribou associated with the Project footprint, as caribou are generally known to avoid project infrastructure. In addition to direct loss, there is also the potential for indirect habitat loss due to Project activities that can create sensory disturbances (for example, noise or air emissions, or human presence) or reductions in the effectiveness of habitats near project activities (dust deposits making forage less palatable, etc.). Baffinland predicted the potential change in effectiveness of caribou habitat for the North Baffin range is a reduction of approximately 2%. This loss of habitat amounts to 0.006 % of the north Baffin Island caribou range and Baffinland expects that this level of effect will be undetectable. Consequently Baffinland states that the Project will have a “not significant” cumulative effect on habitat loss (or reduced habitat effectiveness) on north Baffin Island caribou.

When assessing potential limitations on the movement of caribou related to mining infrastructure, and in particular the Railway, the Milne Inlet Tote Road and ore shipping during the ice season, Baffinland concluded that the primary effects on usual caribou movement patterns will be associated with the Railway. Based on mapping of caribou trails along the Railway, Baffinland predicted 12% of the Railway may form some kind of barrier to caribou movement. Baffinland estimates, however that the length of sections that may pose a barrier range from 1.0 to 2.9 km, which is below a threshold of average daily caribou movement (estimated to be 4 km). Baffinland concluded that they are moderately confident that with monitoring and mitigation measures, the Project will not have a not significant effect on caribou habitat or movement.

With respect to direct caribou mortality due to collisions, Baffinland predicted that collisions, if they do occur would be limited to individuals, and as a result it is not expected that these individual mortalities will have a significant effect on the total numbers of caribou in the region. In relation to increased mortality due to additional hunting pressure, as caribou harvesting in the RSA is primarily a winter activity using snowmachines, local harvesters will likely not have increased access via the roads and railway infrastructure. In addition, project personnel will be prohibited from hunting at project sites,

and accordingly, Baffinland predicted that access to harvesting is not expected to have a significant effect on mortality since there will be no increased hunter access provided by the Project. On this basis, Baffinland predicted that the Project will not have a significant effect on overall north Baffin Island caribou mortality.

For health effects attributed to caribou exposure to metals in soil and vegetation, Baffinland predicted the likelihood of effects to be low due to the relatively small area outside the various Potential Development Areas (PDAs) where dust deposition will be elevated. Consequently, Baffinland predicted the likelihood of significant increases in metals loadings to caribou will be low.

On the basis of these predicted effects, Baffinland proposes the following:

- Relevant Monitoring and Management Plans will continue to be developed, revised and updated under Baffinland's Environmental Management System Terrestrial Environment Management and Monitoring Plan (TEMMP).
- Traffic controls will be put into place to monitor sightings of caribou and other wildlife.
- Waste will be carefully managed to prevent attraction and scavenging by wildlife.
- Seasonal stoppages for trains are possible if large groups of migratory caribou return to the area.
- Snow management will grade snow banks along the Railway and roadway to facilitate caribou crossing.
- The railway embankment will be constructed of fill material at five identified trails for easier caribou movement across the railway embankment.
- Train traffic will be limited to four passes per day to reduce physical barriers from trains.
- Compensation for any harvesting or habitat loss will be included in the Inuit Impact and Benefit Agreement (IIBA) currently under negotiation with the Qikiqtani Inuit Association.

In regard to disturbances to wildlife related to project aircraft, although Baffinland indicated that it recognizes the concern and suggestions for mitigation of these effects by maintaining minimum flight altitudes over wildlife, the Proponent also notes that Baffinland is bound to follow the requirements identified by Transport Canada and that these requirements may limit Baffinland's ability to implement mitigation measures in relation to these effects:

> *As per direction from Transport Canada, "The Proponent shall ensure Air Service contracts related to the project will not impose any flight restrictions on aircraft operations, whether or not flights are close to bird or wildlife sensitive areas. The authority to impose flight restrictions on aircraft operations lies with the Minister of Transport. The guidance for pilots in respect to flights over these areas is provided in Transport Canada document, Aeronautical Information Manual RAC Sections 1.14 and 1.15. Baffinland has indicated it will seek to comply with altitude and flight path mitigations subject to Transport Canada regulations.*[81]

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[81] NIRB Final Hearing File No.: 08MN053, Exhibit 2, "Baffinland Response to Agency Submissions—FEIS, May 30, 2012", dated July 11, 2012, filed by Baffinland, July 16, 2012 under Item T-10 response to the resommendations of the Qikiqtani Inuit Association, p. 11.

In addition, Baffinland, along with the Qikiqtani Inuit Association (QIA), has proposed the establishment of a Terrestrial Environment Working Group which would act as an advisory group to Baffinland's further development of monitoring and mitigation plans for project interactions with the terrestrial environment, including wildlife and wildlife habitat. The Government of Nunavut, Environment Canada and the Qikiqtani Inuit Association have each confirmed their intention to participate in such a working group. The draft Terms of Reference are attached as Appendix 5 to Exhibit 2[82] in the Final Hearing. The parties propose that the efforts of the Terrestrial Working Group would be designed so as not to duplicate or affect the regulatory authority of any government agencies.

4.9.2 Views and Concerns of Interested Parties

Within its final written submission to the NIRB, the Government of Nunavut (GN) noted that, although substantial analysis has been undertaken with the data provided by GN's Baffin Regional Biologist, the GN does not support Baffinland's impacts assessment and prediction with respect to the North Baffin Caribou Herd. Wildlife within Nunavut acts as fundamental components of Inuit Qaujimaningit (IQ), culture, landscape, health of people, and the environment. Given the intrinsic value of wildlife in Nunavut, and most particularly of caribou, the GN's position is that a high level of precaution is required to prevent, manage and address any potential for effects on caribou in North Baffin.

At the outset, the GN was generally in agreement with Baffinland that the caribou population on northern Baffin Island follows a cyclical cycle with a high and corresponding low point every 70 years, as identified through harvest data and traditional Inuit knowledge. However, the Government of Nunavut and Baffinland held differing positions regarding the present population status of the herd, and whether it is continuing to decline or is presently at the lowest point of its 70 year cycle and is no longer declining.

> *The statement made in your report is somewhat different in that it's declining today as opposed to being at a low in the population cycle. So if I can -- if I can simply ask for that clarification; can we agree that the population is at a low, but the analysis presented by Baffinland as informed by the IQ study, the traditional knowledge study, does not indicate a declining state today, it indicates a low in the population?*[83]
>
> *So I cannot say definitively that the population has stopped declining, but nor can Baffinland provide evidence that the population is currently increasing. For that reason, we need to undertake further studies. But I think together we agree that the population is in a critical state and every measure must be taken to protect the caribou.*[84]

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[82] NIRB Final Hearing File No.: 08MN053, Exhibit 2, "Baffinland Response to Agency Submissions—FEIS, May 30, 2012", dated July 11, 2012, filed by Baffinland, July 16, 2012, Appendix 5: Terrestrial Environment Working Group Terms of Reference.

[83] K. Bergner, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26, 2012, p. 2230, lines 18-26.

[84] P. Hale, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 26, 2012, p. 2231, lines 12-18.

The GN further advised that as a result of the vulnerability of the herd during this critical point in the population cycle, adverse effects on individual caribou within the Project's zone of influence, or the herd as a whole, could lead to long term and possibly irreversible effects. Therefore, it was concluded that every effort should be made to mitigate and, where necessary, to minimize adverse effects of the Project on the North Baffin Caribou Herd.

On this basis, the GN offered recommendations for the NIRB's Project Certificate which included support for the establishment of a working group on terrestrial monitoring to develop and oversee the implementation of an adaptive management plan for North Baffin caribou, among other VECs. GN stressed the importance of Baffinland implementing operational measures and monitoring related to the Railway which minimize caribou disturbance and mortality, particularly during calving periods.

The Qikiqtani Inuit Association also indicated the FEIS did not adequately acknowledge that developing the first mine site and Railway on the calving and postcalving ranges of a barren-ground caribou herd in Canada adds a large amount of uncertainty to predicted effects and proposed mitigation.

In particular, QIA indicated that dust fall remains a concern for predicting, monitoring and mitigating effects on caribou. The lack of information on caribou diet (especially use of lichens during calving as well as other seasons) is a concern, as is the uncertainty of the relationship between dust-loading of lichen and caribou foraging behaviour (causing a change in distribution). This concern was also identified with respect to effects on vegetation and is referenced in Sections 4.7.2 and 4.2.2 of this report as well. QIA states that a lack of baseline information and experience drawn from similar project at comparable scale in a similar environment, leads to high level of uncertainty for significance of predicted potential impact and very much highlights the need for Baffinland to continue to develop baseline information, conduct on-going monitoring of actual effects and develop effective and responsive adaptive management plans.

Within its final written submission to the NIRB, the Canadian Transportation Agency (CTA) offered its assessment of the proposed Railway and associated impacts, including Railway permeability and impacts to caribou mobility. The CTA questioned Baffinland's conclusion that the Railway would not be a significant barrier to caribou mobility noting that changes to caribou behaviour, such as hesitating before crossing the line may make caribou more vulnerable to predators and indicating that this has been observed with other wildlife where highway crossings have been conducted.

Given the uncertainty associated with predicting caribou reactions to the Railway, the CTA recommended comprehensive monitoring be extended beyond the initial phase of railway operations long into the project cycle, owing to the current uncertainty regarding the permeability of the railway for caribou movement and also the uncertainty as to the effects should caribou numbers significantly increase and populations become migratory.

Although the CTA acknowledged that given the limited snow cover in winter, Baffinland's assumption that using the Railway to travel would present no advantage to the caribou is a logical one, the CTA also notes that this assumption, has not, to the knowledge of the CTA, been empirically observed. Further, the CTA questioned whether caribou might use the Railway as an energy-saving method of travel in April and May, when Baffinland has indicated that snow fall can be more abundant in the project area.

The CTA also noted that wildlife have been observed to use even slight elevations where a breeze can help to limit their intense exposure to insects during northern summers and consequently, there is a

possibility that when in the vicinity of the Railway and no ridge is in sight, caribou may use the line to limit their exposure to insects.

The CTA concludes that assumptions, such as assuming the caribou will not travel on the Railway remain to be confirmed empirically. The CTA also notes that when caribou populations have increased, the probability of caribou and train collisions will be much higher than currently predicted and this will heighten the need for Baffinland to rapidly implement measures to prevent such collisions. The CTA also notes that the participation of Inuit representatives in finalizing the details of mitigation measures and in planning the monitoring will be required, including locating and designing caribou crossings and determining the need to add new crossings if movement patterns change.

The CTA agrees with Baffinland that clear directives need to be developed to establish thresholds regarding when caribou presence and movement in the vicinity of the Railway triggers immediate attention and changes to railway operations such as reduced speed or limits on train traffic.

As with vegetation, for terrestrial impacts, Environment Canada recommends that Baffinland monitor the extent of terrestrial habitat loss due to the Project to verify their impact predictions and provide updated estimates of the total project footprint in annual monitoring reports.

Throughout the hearing, representatives from Transport Canada noted that flight restrictions such as requiring project aircraft to observe minimum flight altitudes when in proximity to birds and wildlife would be provided as recommendations only because the fundamental focus for pilots of project aircraft is on safety, and as such although Baffinland is encouraged to adopt such measures, these requirements will always be superceded by safety considerations:

> *Flight restrictions with respects to flights over bird and wildlife sensitive areas are recommendations only. Guidance information for pilots is provided in the Transport Canada document, Aeronautical Information Manual, Sections 1.14 and 1.15. These sections state that pilots should not fly at an altitude less than 2,000 feet when in the vicinity of identified wildlife areas, including herds of reindeer or caribou. The proponent is encouraged in the public interest to voluntarily adopt the guidance provided with respect to the aircraft operation near birds and wildlife.*[85]

Community members also expressed concern regarding the effects of aircraft creating a disturbance for caribou, and wondered why they had seen project aircraft fly much closer than the suggested limits:

> *We have seen, numerous times, when Baffinland -- the Twin Otters sends their employees back and forth to the mine. When they're coming this way, they go right below and then straight up -- a -- a -- ascend right up. It's -- and sometimes they fly very low, maybe a hundred in feet. When they get closer, they tend to a -- ascend. Is that a -- a reg -- is -- is that regulation that they're supposed to follow?*[86]

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[85] H. Nikkel, TC, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (am), 2012, p. 2414, lines 5-15.
[86] J. Alooloo, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2484, lines 6-14.

With respect to comments, concerns and issues on this topic raised during the Final Hearing, it became apparent to the Board that in the course of negotiating the Inuit Impact and Benefit Agreement (IIBA), the Qikiqtani Inuit Association has required Baffinland to allow for harvesting of wildlife by Inuit employees in all project areas during leisure hours. This provision is in contrast to Baffinland's current no hunting, no fishing policy for its employees and the statement in the FEIS that due to the hunting and fishing bans, there would be no increase in harvest mortality associated with the project.

However, whether permitting harvesting by Inuit employees during leisure hours would lead to increased harvest pressure on caribou remains a question. Baffinland cited Agnico-Eagle Mines Limited's recent experiences with operating the Meadowbank site where a similar provision of that project's Inuit Impact and Benefit Agreement allows for Inuit employees to bring rifles to site for the purpose of hunting, but in practice employees return to their home community to hunt off-shift rather than bring their rifles to site.

Although quick to point out that Baffinland's proposed Human Resource Management Plan contains provisions intended to address the safe storage and use of firearms on site, Baffinland expressed clear concerns about allowing harvesting in project areas owing to potential impacts to human health and safety.

> *Now, as -- as the -- as the vice president of health and safety, responsible for health and safety for this project, I -- I personally have expressed concerns at the IIBA table regarding some of these issues. And, al -- we've also heard, over these past ten days, agencies and communities have expressed conpern [sic] -- concern about mammals, you know, the -- the terrestrial animals and, especially, caribou. And Baffinland has consistently noted that our management plans and adaptive management plans -- we'll do everything possible to avoid wildlife conflicts.*
>
> *By -- by allowing harvesting on the site, it goes somewhat against what we are talking about here. It --it's -- if -- I want to call it, it's -- it's almost a catch-22, if the word -- buzz word, a catch-22 situation.*[87]

In addition, concerns were raised by parties regarding harvesting in project areas by Inuit employees as proposed under the IIBA having the potential for impacting community harvesting quotas for certain species. The Government of Nunavut and Fisheries and Oceans Canada made it clear that any project-induced mortalities to species where a total allowable harvest is in place, could result in a decrease in the harvesting quotas for surrounding communities.

> *The situation you've posed is hypothetical at this point, obviously; however, I would suggest that, because we determine the total allowable harvest based on the number of [polar bears] in the population, any bear removed from that population affects its viability over the long term. So, just as if there's overharvesting in a particular year, perhaps because of defence kills, we reduce the harvest numbers in subsequent years. I would suggest that we should take into account any mortalities associated with the*

[87] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2475, lines 8-23.

project, and that it could result in a decrease in the harvest available to the communities.[88]

So I think I -- I believe it was Peter from the Government of Nunavut, had provided a -- a bit of an overview that was -- was, kind of, related to polar bear, but the same process would also apply to marine mammals, as well. And so, if there was an incidental take from Baffinland's activities, that would have to be factored into the quo -- the determination of quotas for marine mammals, such as bowhead, narwhal, walrus, beluga. Now, whether that would affect the quotas in the end, it would depend on the species and the management objectives that we had established for those specific animals, and those would vary from -- from species to species and, perhaps, from year to year, as well.[89]

It was further acknowledged that even populations of wildlife which do not currently have total allowable harvest quotas in place, such as the north Baffin Island caribou herd, may be subject to such harvesting restrictions in the future should it be determined that such actions are warranted.

Thank you. Stephen Williamson Bathory. Just a second followup question, we have seen recently in the community of Coral Harbour that a total allowable harvest has been instituted as a conservation measure. Has the GN ever considered instituting such measure for the north Baffin caribou population, particularly given the low population cycle, and as you mentioned, the possibility for cumulative impacts, both over the life of this project and other potential projects.[90]

Peter Hale, Department of Environment. We have not yet entered into discussions about the need for a total allowable harvest type situation in the north Baffin area. It was with great reluctance that we took that action, together with the support of the HTO, in Coral Harbour, as a result of the dramatic decline in the caribou population on Southampton Island. I did mention earlier, in response to the question from Nunavut Tunngavik, that we will be undertaking further research this year to determine the number of caribou left on north Baffin, and certainly once that information and further information from the communities becomes available, I think we'll have to sit down, and we'll have to have hard discussions on whether it is necessary to consider such an action, but I think it's premature at this point in time, Stephen.[91]

There will be a lot of employees at the mine site. I have no idea how many of those would choose to hunt during their off-work hours, so I cannot come up with a -- an evaluation as to the significance of that hunting activity to the population, be it caribou or some other wildlife species, and, therefore, don't know what the impact on the neighbouring communities would be. But, in -- in a situation such as we have here with caribou, which are in very low numbers, the current harvest levels, without the presence

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[88] P. Hale, NIRB Final Hearing File No.: 08MN053 Transcript, July 26, 2012, p. 2271, lines 1-11.
[89] D. Moggy, NIRB Final Hearing File No.: 08MN053 Transcript, July 26, 2012, pp. 2344-45, lines 22-26 and 1-9.
[90] S. Williamson Bathory, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 672, lines 6-15.
[91] P. Hale, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 672-673, lines 16-26 and lines 1-5.

of a lot of mine workers, may not be sustainable, so I would suggest, pardon me, if you allow additional hunting pressure, that could further impact on the recovery of the caribou in the area, and that could impact the neighbouring communities.[92]

4.9.3 Views of the Board

Although Baffinland's predictions are that the Project will have an impact (but not a significant impact) on terrestrial wildlife habitat through habitat loss or reduced habitat effectiveness on North Baffin Island caribou and that the level of effect will be undetectable, given the current lows in the caribou population and the high levels of uncertainty regarding effects predictions on this population in this ecosystem, the Board has determined it is appropriate to apply an elevated standard of the precautionary approach to the potential for effects on caribou. Regardless of whether the population is continuing to decline, as indicated by the Government of Nunavut, or is somewhat stable at its current low levels as indicated by Baffinland, there is no dispute that the current populations have decreased significantly since 2000. The Bpard also recognizesthat these caribou are highly prized and of fundamental importance to the residents of the North Baffin Island communities. What is also apparent to the Board is that there is considerable uncertainty regarding the effects of infrastructure such as the Railway on caribou and that the design of effective mitigation measures is also hampered by uncertainty.

Specifically, the Board finds that the Project will clearly result in direct loss of habitat to areas with identified calving sites and caribou grazing areas. The Board is acutely aware that, unlike mitigation for fish and fish habitat which can be specifically addressed via the provisions in Fisheries and Oceans Canada's authorization for the harmful alteration, disruption and destruction of fish habitat, subsequent permitting requirements of this kind do not extend to terrestrial wildlife. This heightens the need to monitor the extent of terrestrial habitat loss due to the Project to verify impact predictions and provide updated estimates of the total Project footprint at regular intervals.

Further, the NIRB shares concerns raised by the parties regarding dust fall and associated predicting, monitoring and mitigating effects on caribou. In the Board's view, there is a need for additional baseline information on caribou diet (especially use of lichens during calving as well as other seasons) and the relationship between dust-loading of lichen and caribou foraging behaviour (potentially causing a change in distribution).

With respect to indirect habitat loss due to wildlife disturbance associated with noise, vibration and other disruption associated with the Project, the Board shares the concerns of parties, Elders and community members who indicated that the disturbance effects of project aircraft must be mitigated. The Board recognizes that any guidance regarding minimum flight altitudes must always be subject to safety and regulatory requirements prescribed by Transport Canada, but given the high level of public concern regarding these effects, the Board expects Baffinland to ensure that pilots for project aircraft are advised of the importance of voluntarily complying with minimum altitudes and separation distances to minimize disturbance and that Baffinland ensure that flight logs or recorders to verify compliance are in place. The Board also recommends that Baffinland ensure that any reports of aircraft within the

[92] P. Hale, NIRB Final Hearing File No.: 08MN053 Transcript, July 26, 2012, p. 2272, lines 7- 21.

project areas flying below recommended altitudes are reported to the Government of Nunavut for investigation as harrassment to wildlife.

Further, the Board finds that infrastructure components of the Project pose potential barriers and impediments to terrestrial wildlife movement through the Regional Study Area and, as noted by the Canadian Transportation Agency, upon the caribou populations increasing significantly and the caribou becoming more migratory, these effects may also increase as well. Baffinland plans to upgrade the Milne Inlet Tote Road, construct a railway and associated access road, and operate shipping with icebreaking at Steensby Inlet, each component being designed for potential year-round use. Taken together, these components present a unique linear obstacle for terrestrial species such as caribou across the breadth of northern Baffin Island. The NIRB supports the position put forward by the Government of Nunavut in its final written submission: "the consequences of continuous use of the linear infrastructures yearlong on caribou survival and behavior are unknown as well as the effectiveness of planned mitigation measures such as the number and design of caribou crossings."[93]

The Board also noted at the Final Hearing that Baffinland had not considered, whether, in addition to crossings to encourage caribou to cross in various places, there would also be a need for caribou deterrent measures. As the Board heard it is possible that caribou may use the train tracks to escape from insects or avoid deep snow, the Board did ask Baffinland whether deterrent measures to prevent caribou from crossing the road or the Railway in areas where it would be particularly dangerous or difficult for vehicles or the train to see animals or to stop, or to keep caribou from entering tunnels had been contemplated by Baffinland:[94]

> *MR. BARRY: Again, looking at the railway right-of-way, the Milne Inlet tote road, and the various proposed access roads, for areas along the railway right-of-way, the tote road, the potential access roads which are not specifically designed for caribou crossings, can Baffinland clarify whether it intends to utilize any specific caribou deterrents, so Inukshuks, signage, flags, anything like that, to discourage caribou crossing in those areas?*
>
> *MR. SETTERINGTON: Mike Setterington for Baffinland. Ryan, you presented an interesting suggestion there. I have to admit that we've been focusing on enhancing caribou crossing of the railway, and this is one of the first thoughts of actually deterring the railway from -- or deterring caribou from crossing the railway, and I think there might be some specific areas where we may be interested in looking at deterring caribou from crossing the railway if there's particular spots with poor visibility for the train operators. So I think we'll -- we'll take that as a suggestion to the terrestrial working group for design so we can commit to -- to looking at deterrents along portions of the railway as well as enhancements along the rest of the railway.* [95]

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[93] Government of Nunavut, Final Written Submission, dated May 30, 2012, p. 19.

[94] As noted by Baffinland in the FEIS, Vol. 6, Section 5, p. 162: "It is assumed caribou will easily pass over the tunnels; however, there have been instances where caribou (in northeastern Norway) have entered tunnels to escape insect harassment in the summer (Klein 1971)."

[95] Question by R. Barry, NIRB, and response by M. Setterington, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012, pp. 2142-2143, lines 25-26 and lines 1-22.

With respect to the Milne Inlet Tote Road, although the Board recognizes that through the life of the Project, the Tote Road is not intended to be used intensively, and will be used infrequently during the winter, the Board has concerns that Baffinland has not considered the need for incorporating caribou crossings into the current design of the pre-exisiting road. However, the Board notes that the company did acknowledge at the Final Hearing that it would plan to assess the need for crossings if upgrades are needed to embankments of the Tote Road moving forward:

> *The Milne Inlet tote road has been a feature of the landscape for more than 40 years, so we know from the work that we've done that it doesn't present a barrier to caribou movement at the moment. So in answer to your question, the -- there's no areas that we see being a barrier, so crossings have not been incorporated as part of the Milne Inlet tote road.*[96]
>
> *With respect to the Milne Inlet tote road, for the upgrades, again, if there is any upgrades to embankments of the tote road, then we would -- we would assess those areas, and, again, if we thought it could be a barrier to movement, then we would implement a crossing design that would facilitate movement. But the culvert locations aren't known to -- to provide any barrier at this time.*[97]

The Board also noted that the construction of the Railway may require construction of a corresponding access road, up to 162 km in length, along the length of the railway corridor. At the current stage of development, Baffinland was unable to confirm whether this access road, if constructed, would be maintained for use throughout the life of the Project. Through the course of the Final Hearing Baffinland committed that the design features of both the Railway and any associated access road would also take into account the caribou crossings for the Railway.[98]

As noted by the Canadian Transportation Agency, the Board also would like to see clear thresholds to be developed regarding when caribou presence and movement in the vicinity of the Railway triggers immediate attention and changes to railway operations such as reduced speed or limits on train traffic. Given the potential for significant changes in the caribou populations and behaviour over the life of the Project, the Board recognizes that these thresholds would need to be revisited and updated as part of Baffinland's on-going commitment to adaptive management.

With respect to the potential effects of increased mortality related to the Project, the Board recognizes that most terrestrial wildlife populations in Nunavut are subject to harvesting by Inuit, and as such any impacts to population levels involve the potential of impacting upon the ability of Inuit to harvest. In the Board's view, the Project has the potential to result in increased harvesting mortality due to improved access to wildlife via project infrastructure such as the Milne Inlet Tote Road, which would be upgraded for year-round use by Baffinland. However, although there is a public easement on the Milne Inlet Tote Road, the nearest community (Pond Inlet) is a considerable distance away. As a result, while it is reasonable to expect occasional use of this infrastructure by members of the general public who are

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[96] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012, p. 2136, lines 14-21.
[97] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012, p. 2137, lines 16-23.
[98] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012 p. 2138, lines 19-21.

harvesting within the project area, the NIRB does not expect increased harvesting pressure to be significant due to improved access.

The Board does, however have concerns with respect to the potential for negative impacts on human health and safety, wildlife population levels and the ability to harvest by surrounding communities to the extent that quotas are affected by reductions in populations if Baffinland does allow harvesting of wildlife in all project areas by Inuit employees. Although the Board recognizes that the right of Inuit to harvest wildlife throughout the Nunavut Settlement Area is enshrined in Section 5.7.16 of the Nunavut Land Claims Agreement (NLCA), the Board also recognizes that these rights can be limited when necessary for the purposes of public safety, as provided for under Section 5.7.18 (NLCA).

Baffinland's concern with respect to various aspects of this provision of the current draft Inuit Impact and Benefit Agreement (e.g. project site safety and security) was apparent, and resulted in the company recommending that the Qikiqtani Inuit Association consider including a restriction within the Inuit Impact and Benefit Agreement to the full harvesting rights enshrined in the NLCA.

> *The other thing we do recognize, that the Inuit organizations, such as the Qikiqtani Inuit Association, can, on their own, under the Nunavut Land Claim Agreement, set restrictions to certain clauses in the Nunavut Land Claim Agreement. So I guess that, from our standpoint, Baffinland, we recommend that the Qikiqtani Inuit Association consider this in the Inuit Impact Benefit Agreement in -- in regards to this matter.*[99]

4.9.4 Conclusions and Recommendations of the Board

There is agreement amongst the parties regarding the need for continued baseline data collection and active monitoring to verify many of Baffinland's impact predictions as presented in the FEIS, with direction and guidance to be provided by a Terrestrial Environment Working Group established for the Project. The NIRB supports this concept and has provided specific recommendations and direction to Baffinland and the Terrestrial Environment Working Group throughout the following section.

Terrestrial Environment Working Group

1. The Proponent shall establish a Terrestrial Environment Working Group ("TEWG") which will act as an advisory group in connection with mitigation measures for the protection of the terrestrial environment and in connection with the Proponent's Environmental Effects Monitoring Program, as it pertains to the terrestrial environment. Membership on the TEWG will include Baffinland, the Qikiqtani Inuit Association, the Government of Nunavut, Environment Canada, and any other agencies or interested parties as determined to be appropriate. The members may consider the draft terms of reference for the TEWG filed in the Final Hearing, but they are not bound by them.

   The TEWG will provide direction and guidance to the Proponent regarding: adding to baseline information during construction and before project operations commence; monitoring and reporting regarding effects occurring during operations; and providing advice regarding changes

[99] E. Madsen, NIRB Final Hearing File No.: 08MN053 Transcript, July 27, 2012, p. 2476, lines 16- 23.

that may be required to make sure the management of negative impacts is effective and that lasting damage is prevented. The role of the TEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.

General

2. The Proponent shall continue to develop and implement Project-specific monitoring for the terrestrial environment, and will demonstrate appropriate refinements to design, incorporation of analytical methods and elaboration of methodologies. The monitoring plan shall contain clear thresholds to allow for the assessment of long-term trends and cumulative effects where project interactions are identified. Coordination and cooperation will be required where data collection, analysis and interpretation, or responsibility for mitigation and management requires the efforts of multiple parties (e.g., government, Qikiqtani Inuit Association, communities).
3. The Proponent, directly or as part of the TEWG shall consider and, where appropriate, shall cooperate with relevant regional and/or community-based monitoring initiatives that raise issues or produce information pertinent to mitigating project-induced impacts.

Caribou

4. Within 3 months of issuance of the Project Certificate, the Proponent shall initiate design, and develop the timeline to test and implement means of deterring caribou from pits and other hazardous areas. A review of best practices and techniques will be undertaken at other Northern mines where interactions with caribou occur. Considerations should include temporary ribbon placement, inuksuks, or fencing and subsequent monitoring for effectiveness. These activities shall be reported back to the Terrestrial Environment Working Group.
5. In further developing its monitoring program and adaptive management plans as applicable to the terrestrial environment, the Proponent shall demonstrate consideration for the following:
    a. Steps taken to prevent caribou mortality and injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads.
    b. Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times.
    c. Evaluation of the effectiveness of proposed caribou crossings over the railway, Milne Inlet tote road and access roads as well as the appropriate number.
    d. Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded.
    e. Protocols for documentation and reporting of all caribou collisions and mortalities, as well as mechanisms for adaptive management responses designed to prevent further such interactions.
6. Within 6 months of the issuance of a Project Certificate, the Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include, but not be limited to the following:
    a. Details of the methods and rationale for conducting monitoring prior to the commencement of construction;

b. Monitoring for caribou presence and behavior during railway construction;

c. Description and justification of statistical design or other means of determining effect and proposed analyses to support the conclusions drawn from monitoring impacts of the mine and related infrastructure on wildlife;

d. Details of monitoring and mitigation activities, including:

   i. Dust fall (fugitive and Total Suspended Particulates), that addresses methods to reduce risk to caribou forage from dust fall;

   ii. Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway. Using the result of this information, an early warning system for caribou on the railway shall be developed for operation.

e. Details of monitoring thresholds related to level of mitigation and management;

f. Details of a comprehensive hunter harvest survey to determine the effect on caribou populations and potential effect on caribou behaviour resulting from increased human access caused by upgrades to the Milne Inlet tote road (and any other roads if they are shifted from private to public use) and increase local knowledge of the mine site, including establishing pre-construction baseline harvesting data.

Wolves

7. The Proponent shall develop an adaptive management plan applicable to wolves and wolf habitat in collaboration with the Government of Nunavut-Department of Environment (GN-DOE) to ensure compliance with the *Nunavut Wildlife Act.* Consideration must be given to the following:

   a. monitoring for active wolf dens within a 10 km radius from the mine site, under the direction and prior approval of the GN DOE, and reporting the results through NIRB's Annual Reports on terrestrial wildlife in the Potential Development Area (PDA);

   b. estimating the available (glacio-fluvial materials) esker habitat within the Regional Study Area/PDA and identifying such habitat as ecologically sensitive

   c. developing "wolf indices" for presence/abundance of wolves (by conducting studies) to set a baseline pre-construction baseline;

   d. ensuring that wolf monitoring is capable of determining the relative abundance and distribution of wolves in the Project Development Area over time

Wildlife Habitat

8. The Proponent shall develop a strategy for the recovery of terrestrial wildlife habitat in a progressive manner that is consistent with the *Nunavut Wildlife Act*. Overall, this will require the integration of a decision-making process and the identification of mitigation responses to cumulative impacts on caribou survival, breeding propensity, and population dynamics.

Reporting

9. The Proponent shall report annually to the NIRB regarding its terrestrial environment monitoring efforts, with inclusion of the following information:

   a. Description of all updates to terrestrial ecosystem baseline data;

b. A description of the involvement of Inuit in the monitoring program;

c. An explanation of the annual results relative to the scale of the natural variability of Valued Ecosystem Components in the region, as described in the baseline report;

d. A detailed presentation and analysis of the distribution relative to mine structures and activities for caribou and other terrestrial mammals observed during the surveys and incidental sightings;

e. Results of the annual monitoring program, including field methodologies and statistical approaches used to support conclusions drawn;

f. A summary of the chronology and level of mine activities (such as vehicle frequency and type);

g. An assessment and presentation of annual environmental conditions including timing of snowmelt, green-up, as well as standard weather summaries;

h. A discussion of any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program;

10. Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes:

    a. An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting;

    b. A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway;

    c. A description of the extent of dust fall based on measured levels of dust fall (fugitive and finer particles such as TSP) on lichens and blueberries, and ash content of caribou fecal pellets;

    d. A demonstration and description of how the monitoring results contribute to cumulative effects of the project;

    e. Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program;

    f. Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the Qikiqtani Inuit Association and affected communities, and shall be circulated as new information becomes available.

Aircraft Disturbances

11. The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point to point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise

prescribed by the Working Group) and use flight corridors to avoid areas of significant wildlife importance.

Blasting

12. Prior to construction, the Proponent shall develop a detailed blasting program to minimize the effects of blasting on terrestrial wildlife that includes, but is not limited to the restriction of blasting when migrating caribou, sensitive local carnivores or birds may be negatively affected.

Operations - General

13. Whenever practical and not causing a human safety issue, a stop work policy shall be implemented when wildlife in the area may be endangered by the work being carried out. An operational definition of ‘endangered’ shall be provided by the Terrestrial Environment Working Group.
14. The Proponent shall prohibit project employees from transporting firearms to site and from operating firearms in project areas for the purpose of wildlife harvesting.

Public Engagement

15. The Proponent shall liaise with local Hunters and Trappers Organizations in advance of carrying out terrestrial wildlife surveys. At a minimum, the Proponent shall also meet annually in person with Hunters and Trappers Organizations to address communicate wildlife monitoring and mitigation plans and address community concerns regarding wildlife interactions. The Proponent may be required to facilitate these meetings through payment of honoraria and meeting costs.

Waste Management

16. The Proponent shall ensure that its Environment Protection Plan incorporates waste management provisions to prevent carnivores from being attracted to the Project site(s). Consideration must be given to the following measures:
    a. installation of an incinerator beside the kitchen that will help to keep the food waste management process simple and will minimize the opportunity for human error (i.e. storage of garbage outside, hauling in a truck (odours remain in truck), hauling some distance to a landfill site, incomplete combustion at landfill, fencing of landfill, etc.)
    b. installation of solid carnivore-proof skirting on all kitchen and accommodation buildings (i.e., heavy-duty steel mesh that would drop down from the edge of the buildings/trailers and buried about a half meter into the ground to prevent animals from digging under the skirting).

4.10 Birds

4.10.1 Views of the Proponent

The study area used in the assessment of Project effects on birds contained in the FEIS, Vol. 6, Section 4 has both a marine component (the marine Regional Study Area) and a terrestrial component (the

terrestrial Regional Study Area), as the potential for effects on birds exists in both the marine and terrestrial environments.

Field surveys in the Project Area documented 54 bird species within the marine and terrestrial Regional Study Areas, with 25 species confirmed to breed throughout the marine and terrestrial Regional Study Areas. There were no conspicuous seabird nesting colonies recorded during Baffinland's Project surveys, but several such colonies are known to exist within and adjacent to the marine Regional Study Area, particularly on Bylot Island, Foxe Basin, and along Hudson Strait. A large breeding colony of Snow Geese (>5,000 individuals) was also identified during the surveys on the southwestern shores of Steensby Inlet.

Five of the species identified are Species at Risk: Peregrine Falcon (a common breeder within the terrestrial Regional Study Area); Short-eared Owl (documented within the terrestrial Regional Study Area but showing no signs of nesting there); and Ivory Gull, Ross's Gull and Harlequin Duck (all detected within the marine Regional Study Area, but no nesting sites were located). Baffinland noted that one additional Species at Risk, the Red Knot, had the potential to be found within the Project Area, but was not identified during baseline surveys.

Inuit Qaujimaningit from the surrounding area suggests that many areas in the marine and terrestrial Regional Study Areas are used by migratory bird species that typically arrive in late-April, May, and June and leave the area starting in August through late October, depending upon species and sex. Breeding occurs throughout the area: most of the islands within the Regional Study Area are used as nesting grounds by various species of seabirds, gulls, terns and waterfowl, and some large colonies of seabirds and gulls are known along cliff habitats. Species such as geese, eiders, loons and ducks can be found nesting along coastlines or inland along freshwater lakes. Some birds, such as Common Raven, ptarmigan, and sometimes Snowy Owl, winter in the area, and some seabirds, such as Black Guillemot, also remain in the area year-round using the open shore leads in the winter. Residents of all five communities indicated that harvesting of birds and their eggs is still important to them and the species that are most commonly harvested are Snow Goose, Common and King Eider, Arctic Tern (eggs only), and Long-tailed Duck.

The central categories of potential project effects were identified as: habitat loss; mortality risks; and health risks, any of which alone or in combination could have an effect on bird behaviour, population abundance and distribution.

On the basis of criteria including whether the indicator is a species at risk, a species of concern, an important harvest species for North Baffin communities, exhibits unique behaviour (such as flightless migration in the marine Regional Study Area) which may make the species particularly likely to interact with Project components, Baffinland chose the following key indicator species for impact assessment: peregrine falcon, snow goose, common and king eider, red-throated loon, thick billed murre, and lapland longspur.

Baffinland indicated that migratory birds may be subject to the following Project effects:

- direct loss of and changes to the quality and availability of habitat due to the Project Developed Area (PDA) being unavailable for use by species;
- indirect habitat loss occurring as a result of birds avoiding areas impacted by dust, noise, increased human presence and adjacent to the Railway, road, and shipping lanes;

- mortality associated with collisions with vehicles, aircraft, or permanent structures;
- effects on health or even mortality associated with the release of contaminants by the Project (either sudden and accidental such as spills, or released over time such as dust emissions);
- mortality due to increased access to birds by hunters in project areas;
- mortality due to ship strikes of seabirds in the marine Regional Study Area.

Baffinland indicated that for all five key indicator species, the primary effects are likely to be associated with habitat loss and sensory disturbance of habitats used for staging, nesting, foraging and brood-rearing. Although Baffinland predicted that some mortality might be expected from accidents and collisions (air, vehicular and rail traffic), increased harvesting and/or exposure to contaminants and some individual-level displacement and disturbance is expected to occur in a relatively small zone of influence during all Project phases, no changes to key indicator populations are expected. Baffinland also predicts that with mitigation measures, the Project will not have a significant effect on habitat loss, mortality and health of the key indicator bird species including Peregrine Falcons, Snow Geese, Common and King Eiders and Red-throated Loons

Baffinland's proposed monitoring and mitigation measures include the following:

- Relevant monitoring and management plans will be provided under Baffinland's Environmental Management System, Terrestrial Environment and Monitoring Plan (TEMMP) and key indicators for follow up monitoring will include: peregrine falcon, gyrfalcon, common and king eider, red knot, seabird migration and wintering, and songbird and shorebird diversity.
- Ground disturbance activities will be planned to take place outside the breeding season to minimize the effects of the Project on the key indicator species.
- The footprint of Project facilities will be minimized to limit ground disturbance.
- All employees will be required to take an awareness program will about the importance of avoiding known nests and nesting areas and large concentrations of foraging and moulting birds.
- Where possible, aircraft approach and departure flight paths will be charted to avoid birds.
- Where possible, a 500 metre radius will be maintained around nests until fledging takes place.

4.10.2 Views and Concerns of Interested Parties

Parks Canada recognized the efforts Baffinland has made to address areas of concern (seabirds, caribou, and marine mammals) in its responses to other reviewing organizations. Management and interests for these areas of focus are shared with other reviewing organizations. Given this shared interest, and given that these reviewing organizations have more extensive scientific expertise, Parks Canada deferred specific comments on several areas of the technical review of the FEIS with respect to impacts on seabirds to Environment Canada (EC).

With respect to the potential for effects associated with direct and indirect habitat loss to terrestrial migratory brids, in EC's final written submission, EC indicated that with the implementation of appropriate mitigation measures to reduce potential sources of bird mortality and sensory disturbance, direct and indirect habitat loss for terrestrial migratory birds is unlikely to have impacts of concern to EC.

EC did however, suggest that Baffinland should monitor the extent of terrestrial habitat loss due to the project to verify its impact predictions and provide updated estimates of the total project footprint in annual monitoring reports.

Specifically with respect to preventing effects associated with disturbance/destruction of nests and eggs of migratory birds, EC urged Baffinland to take the following preventative measures:

a. Baffinland consult the fact sheet "Planning Ahead to Reduce Risks to Migratory Bird Nests" available at: http://www.ec.gc.ca/paom-itmb/

b. Baffinland minimize the amount of habitat disturbance that will take place during the migratory bird breeding season

c. For areas that cannot be cleared or disturbed outside of the nesting season, areas should be thoroughly surveyed for active nests using a scientifically sound approach a maximum of 4 days before destruction/clearing. Surveys should be carried out by an avian biologist or naturalist with experience with migratory birds and migratory bird behaviour indicative of nesting (e.g. aggression or distraction behaviour; carrying nesting material or food)

d. Baffinland develop a pre-clearing nest survey protocol to be included in the Terrestrial Environment and Monitoring Plan

e. Baffinland undertake to protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in Baffinland's Terrestrial Environment and Monitoring Plan (Vol. 10 – Appendix 10D-11) until the young have fledged

f. In cases where it is not feasible to use the recommended setback distances to protect a nests, nest specific guidelines and procedures should be developed

With respect to bird mortality associated with collisions with project infrastructure, EC commented that although having no guy-wires associated with communications towers does decrease the risk of bird collisions, EC did not agree with Baffinland's assessment that lights associated with towers did not pose a hazard because the area will be experiencing 24 hour sunlight throughout most of the migration and breeding season. As noted by EC birds may still be migrating until the end of October, and by early September, day length appreciably shortens from 15 hours at the start of the month to 11 hours by the end. On this basis, EC recommends flashing red, red strobe or white strobe lights be installed on the towers and that flood lights or other light sources at the base of communications towers should not be left on through the night during fall migration.

With respect to bird mortality associated with the potential increased predation on migratory birds associated with predators and scavengers being attracted to project sites, EC recommends that measures to prevent sites from becoming an attractant be incorporiated into the Terrestrial Environment Management and Monitoring Plan, the Waste Management Plan for Construction, Operation and Closure, and the Environmental Protection Plan.

To prevent effects on migratory birds associated with project aircraft, EC recommends that minimum flight altitudes be maintained over areas likely to have migratory birds (650 m) and areas where observed concentrations of migratory birds are present (1100 m). EC also recommends that in situations where it is not feasible to maintain an altitude of 1100 m, aircraft should maintain a lateral distance of at least 1500 m from the boundary of this site.

For potential effects on bird species that are species at risk, as well as effects on their nests and eggs, EC notes that the primary mitigation measure should be avoidance and that specific nest setback distances outlined in Baffinland's Terrestrial Environment Management and Monitoring Plan should be used to determine zones of avoidance. EC also notes that, as required by law, Baffinland should ensure that any migitation and monitoring strategies associated with species at risk must be consistent with all applicable status reports, recovery strategies, action plans and management plans associated with that species, and to that end, EC encourages Baffinland to consult with the relevant regulatory authority in their development of any adaptive management plans.

With respect to migitation and monitoring plans, EC notes that Baffinland has willingly incorporated many of the recommended mitigation measures provided by EC in the DEIS submission into the draft Terrestrial Environment Management and Monitoring Plan, but urges Baffinland to ensure that the measures in the TEMMP and the Environmental Protection Plan are consistent, particularly with respect to the setback distances for bird nests and flight altitude guidelines. With respect to mitigation and monitoring plans, the Nunavut Research Institute (NRI) recommends that the Project Certificate include a term and condition that Baffinland develop and share with the NRI and the Government of Nunavut - Department of Environment (GN-DOE) a plan for coordinated, consistent Inuit involvement in project monitoring programs for key valued ecosytemic components (VECs) and indicators (including birds).[100] The GN also noted in their technical review comments on the DEIS that Baffinland had assumed shared life characteristics between migratory and non-migratory raptor species, and the GN noted that assessment of impacts and proposed monitoring measures should be adapted to reflect the differences between migratory and non-migratory species (e.g. timing of nesting season, patterns and susceptibility to disturbance).

In addition, EC notes the on-going importance of the Terrestrial Environment Working Group to provide further advice and guidance on the details of the mitigation and monitoring plans required to prevent, monitor and adaptively manage these potential effects.

At community meetings throughout the NIRB's review of the Project and at the Final Hearing, community representatives and members of the public identified several concerns related to the potential Project effects on migratory birds, including the potential for effects on bird species that are important harvest species to North Baffin communities such as snow geese,[101] potential for migratory bird sanctuaries to be affected by year round shipping[102] and increased air travel and effects of shipping on nesting grounds (including nesting grounds close to shorelines due to wake effects).

4.10.3 Views of the Board

[100] NRI indicates that key elements of this plan should address: Inuit involvement in monitoring design; Inuit training and engagement in data collection; methods for engaging Inuit in analysis and interpretation of monitoring data, including the determination of effects; the process for evaluating the effectiveness of Inuit engagement efforts, and for improving engagement practices where necessary; and reporting of monitoring results to Inuit communities.

[101] J. Alooloo, Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, pp. 2492-2493 and p. 2499.

[102] E. Peter, Cape Dorset, Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1179.

As noted by Baffinland in the FEIS, there is a lack of information about the level of disturbance that would cause birds to flush from and/or abandon their nests completely and there is no information regarding bird responses to ship movements in close proximity to the nest site and only limited information regarding aircraft-related disturbances. In the Board's view, this lack of information introduces an element of uncertainty into the impact predictions provided in the FEIS. The NIRB is supportive of the recommendations put forward by parties, and agrees that reasonable measures to prevent impacts, such as avoidance of nesting sites and ongoing monitoring, should be further developed within Baffinland's Environmental Monitoring System. Given the importance of migratory birds to North Baffin communities and the existing data gaps, the Board has applied the precautionary approach and has focused its recommendations on measures that prevent potential effects, monitor and adaptively manage effects.

4.10.4 Conclusions and Recommendations of the Board

Awareness

1. The Proponent shall ensure all employees working at project sites receive awareness training regarding the importance of avoiding known nests and nesting areas and large concentrations of foraging and moulting birds.

Species at Risk

2. If Species at Risk or their nests and eggs are encountered during Project activities or monitoring programs, the primary mitigation measure must be avoidance. The Proponent shall establish clear zones of avoidance on the basis of the species-specific nest setback distances outlined in the Terrestrial Environment Management and Monitoring Plan.
3. The Proponent shall ensure that the mitigation and monitoring strategies developed for Species at Risk are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans and management plans that may become available during the duration of the Project.

Project Infrastructure

4. The Proponent shall ensure flashing red, red strobe or white strobe lights and guy-wire deterrents are used on communications towers established for the Project. Consideration should also be given to reducing lighting when possible in areas where it may serve as an attractant to birds or other wildlife.

Construction/Clearing Activities

5. Prior to bird migrations and commencement of nesting, the Proponent shall identify and install nesting deterrents (e.g. flagging) to discourage birds from nesting in areas likely to be disturbed by construction/clearing activities taking place during the nesting season.
6. The Proponent shall protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in its Terrestrial Environment Mitigation and Monitoring Plan, until the young have fledged. If it is determined that observance of these setbacks is not feasible, the Proponent will develop nest-specific guidelines and procedures to ensure bird's nests and their young are protected.

Flight Altitude Requirements

7. Subject to safety requirements, the Proponent shall require all project related aircraft to maintain a cruising altitude of at least:
   a. 650 m during point to point travel when in areas likely to have migratory birds
   b. 1100 m vertical and 1500 m horizontal distance from observed concentrations of migratory birds
   c. 1100 m over the area identified as a key site for moulting snow geese during the moulting period (July-August), and if maintaining this altitude is not possible, maintain a lateral distance of at least at least 1500 m from the boundary of this site.
8. The Proponent shall ensure that pilots are informed of minimum cruising altitude guidelines and that a daily log or record of flight paths and cruising altitudes of aircraft within all Project Areas is maintained and made available for regulatory authorities such as Transport Canada to monitor adherence and to follow up on complaints.

Monitoring

9. The Proponent shall develop detailed and robust mitigation and monitoring plans for migratory birds, reflecting input from relevant agencies, the Qikiqtani Inuit Organization and communities as part of the Terrestrial Environment Working Group and to the extent applicable the Marine Environment Working Group.
10. The Proponent shall continue to develop and update relevant monitoring and management plans for migratory birds under the Proponent's Environmental Management System, Terrestrial Environment Mitigation and Monitoring Plan prior to construction. The key indicators for follow up monitoring under this plan will include: peregrine falcon, gyrfalcon, common and king eider, red knot, seabird migration and wintering, and songbird and shorebird diversity.
11. The Proponent's monitoring program shall assess and report, on annual basis, the extent of terrestrial habitat loss due to the project to verify impact predictions and provide updated estimates of the total project footprint.

4.11 Marine Environment, Marine Water/Ice and Sediment Quality

4.11.1 Views of the Proponent

The focus of this component of the assessment, as set out in Baffinland's FEIS, Vol. 8, Sections 2 and 3 is on the potential for the Project to affect sea ice and marine water and sediment quality. Baffinland's assessment considered the potential effects of icebreaking activities on sea ice along the shipping route to the proposed port at Steensby Inlet, and considered these effects in the waters from the Nunavut Settlement Boundary at the Labrador Sea, the northern portion of Hudson Strait, Foxe Basin, and into Steensby Inlet (FEIS, Figure 8-2.1). Baffinland concluded that as shipping to Milne Port will occur only during open water periods for Project construction and occasionally (less than once per year) during the open water period throughout the operational phase, no shipping-related effects to sea ice are anticipated along that route. As noted by the Proponent, throughout the assessment and Review, project-related effects to sea ice were identified as being of utmost importance to Inuit, as changing ice

conditions could have potentially significant impacts on their culture, traditional activities and the animals that are dependent on ice.

Baffinland identified the following as potential key project interactions with ice conditions:

- Disruption of landfast ice in Steensby Inlet and at Steensby Port by icebreaking ore carriers and ice management activities;
- Disruption of landfast ice at Steensby Port by ballast water discharge from ore carriers; and
- Spills and emergency management during construction and operation[103].

With respect to project activities that could affect water and sediment quality in the vicinity of the proposed port sites the following were considered:

- Discharge of ballast water from supply vessels and ore carriers;
- Airborne dispersion of dust from ore stockpiles;
- Discharge of treated wastewater; and
- Diesel spills.

Studies to establish baseline conditions and anticipated effects of the Project on marine water and sediment quality around the Milne and Steensby Ports and on sea ice in Hudson Strait, Foxe Basin and Steensby Inlet, due to year-round shipping yielded the following information:

- The baseline water quality of Milne Inlet and Steensby Inlet was nearly neutral (pH around 7), hard, and clear with moderate amounts of nutrients. Nutrient concentrations were generally typical of nearby arctic waters.
- The major elements in water samples collected from Milne Inlet and Steensby Inlet reflect those typical of marine waters (e.g., chloride, sodium, sulphate, magnesium, etc.). Several metals (including cadmium and iron) are present in such low concentrations that they are generally below the analytical level of detection.
- Baseline mercury concentration at Milne Inlet exceeded the Canadian Council of Ministers of the Environment (CCME) guideline for the protection of marine aquatic life in two samples collected from Milne Inlet.
- Sediments in shallow areas of Steensby Inlet tended to have a higher amount of coarse material than those in deeper areas; this was not observed for Milne Inlet sediments.
- Metal concentrations are higher in sediments with a higher proportion of fines and are similar to concentrations reported in literature.
- Petroleum compounds measured in Milne Inlet were low, also reflective of the literature.
- Baseline concentrations of arsenic, cadmium, chromium, copper, lead, mercury, and zinc at Milne Inlet were always below Probable Effects Levels and Interim Sediment Quality Guidelines

[103] These potential effects were considered under the specific Accidents and Malfunctions section of the FEIS and were not considered further under the Marine Environment section.

identified in the Canadian Council of Ministers of the Environment (CCME) Canadian Sediment Quality Guidelines for the Protection of Aquatic Life.

- Baseline metal concentrations at Steensby Inlet were higher in sediments with higher proportions of fines, similar to trends observed in previous studies of the region.
- Baseline concentrations of arsenic, cadmium, chromium, copper, lead, mercury, and zinc at Steensby Inlet were always below Probable Effects Levels and most were below the Interim Sediment Quality Guidelines.
- Each winter, extensive ice forms along the coastal areas of Foxe Basin and Hudson Strait. Landfast ice extends throughout Steensby Inlet as far south as Koch Island. Much of Foxe Basin and Hudson Strait are covered by moving pack ice.
- Stable areas of landfast ice provide important hunting areas for Inuit.
- The distribution of sea ice and its relationship to open water plays an important role in determining the distribution, movement patterns, and abundance of marine biota. Microalgae and associated secondary producers establish on the bottom of the ice each spring, providing forage for fish such as Arctic cod and for seabirds.

The Proponent identified the following as predicted impacts of the Project on marine water and sediment quality and sea ice:

- Activities that occur at Milne and Steensby Inlets during the construction, operation, or decommissioning phases of the Project that could potentially alter water or sediment quality include the construction of docks; disruption and erosion of sediments by barge and ship traffic; discharge of ballast water; emission of dust from ore stockpiles; and runoff and discharges from land based Project activities such as wastewater, stockpile runoff, and site water.
- Dust can affect marine water and sediment quality by settling onto water bodies. Dust will be present year-round at Steensby Port and, during winter, dust may accumulate on nearby ice and snow. Milne Port will only be in operation during the open water season when dust deposition could cause low level increases in levels of metals and thereby affect water quality in local areas of fresh and salt water. At Steensby Port, dust deposition may result in occasional increases in metals and Total Suspended Solids (TSS).
- Run-off from the port sites to the adjacent marine environment will occur during all phases of the Project, due to land based activities such as travel on roads, ground disturbance, dusting and snow management.
- Construction of the proposed Milne Port and at Steensby Port may cause localized and temporary increases in Total Suspended Solids (TSS) and associated nutrients and metals in water.
- Ships' propellers can also affect sediments in the port waters by stirring up the seabed in relatively shallow water. This may increase total suspended sediment, nutrient levels, and metal levels in the water column. Because of the relatively small size of the area affected, the barge and ship traffic at both Steensby and Milne Ports are not predicted to significantly affect water quality.
- No negative effects to water or sediment quality at the dock side due to ship discharges are predicted because vessels will be operated and maintained in compliance with pollution

prevention laws and regulations which prohibit discharge of bilge water or sewage while at the dock side.

- In order to reduce or eliminate the risk of invasive aquatic species and pathogens being introduced into Canadian waters as a result of shipping, all ships will exchange ballast water in accordance with the *Ballast Water Control and Management Regulations* (Transport Canada 2006). The regulations require that ships transiting to Canadian ports exchange ballast water at sea in deep water away from coastal zones. This measure limits the potential for foreign harmful aquatic organisms or pathogens to be released in Canadian waters where they may colonize.
- Upon arrival at the port, the ships will discharge ballast water to allow for filling the ship with ore. Ships will meet all future regulatory requirements for the treatment of ballast water using methods identified by Transport Canada.
- Ballast water will be pumped from each ore carrier when it arrives at Steensby Port. This water will have a slightly higher temperature and salinity than the surrounding water at each port. The pumped water will settle to the sea floor and result in small changes in the area.
- At Milne Inlet water quality could be affected by the following land based discharges: treated sewage effluent; treated melt water from the tank farm containment area, and general site drainage.

These sources can be expected to result in decreases in water quality with respect to metals levels, pH, and/or total suspended sediment. In all cases, the discharges will rapidly dilute in the environment. Consequently, Baffinland concluded that no significant effects on sediment quality were anticipated.

- At Steensby Port water quality could be affected by three land based discharges: sewage wastewater; ore stockpile runoff, and general site drainage. As these sources will all be treated prior to release, few decreases in water quality are expected.
- Once the Project is decommissioned, the removal of docks and other structures at Steensby and Milne Ports could result in reductions of both water and sediment quality.
- Ice breaking will occur along the length of the nominal shipping corridor and the primary interaction between the Project and sea ice will be physical alteration or disturbance due to the passage of the ship. Other effects due to ice breaking, particularly increased underwater noise, will have no effect on the sea ice itself, but will interact with marine biota associated with the ice.
- Construction activities on ice will have no effect on landfast ice beyond the immediate work areas.
- Less than 1% of the Local Study Area and less than 0.5% of the Regional Study Area pack ice will be disturbed by ice breaking ore carriers during operation. Since pack ice is in constant motion, the ship track through pack ice will quickly close leaving little evidence of the passage.
- Due to density differences between ballast water and water in Steensby Inlet, it is anticipated that ballast water will have little or no effect on ice except immediately by the dock side where it is discharged.
- Annual icebreaking activity will cause physical alteration of landfast ice in Steensby Inlet. It is predicted that a maximum of 6.1% of the landfast ice in Steensby Inlet and less than 0.5% of the

landfast ice in Foxe Basin and the Regional Study Area will be affected by shipping. The effects on integrity of landfast ice are not predicted to be significant.

Based on these conclusions, the Proponent proposed the following mitigation measured to address the potential effects of the Project on marine water and sediment quality and sea ice:

- The use of silt curtains in waters will reduce the affected areas during construction and closure activities.
- At Steensby Port, ore stockpile and site runoff will be collected and allowed to settle prior to summer discharge into the marine environment.
- Treated sewage effluent will be discharged at depth into Steensby Inlet year-round.
- Sewage, oily water, truck wash, maintenance facilities and explosives equipment washwater will all be treated prior to discharge into the marine environment.
- Emergency and Spill Response Plans will be in place to deal with all land-based and shipping unplanned events.
- No discharge of ship waste will be permitted at dock side.
- Dust suppression and dust control measures will be in place to limit emissions of particulates to the atmosphere that could settle in port waters.
- The width of the shipping lane through fast ice will be minimized to the extent possible. The shipping lane into Steensby Port will be delineated with markers that can serve to identify the boundaries of previous vessel tracks and act as a guide for the vessel.
- Icebreaking tugs and ore carriers will restrict their area of operation to the extent practical such that the total area of broken landfast ice at the Steensby Port is limited.

Baffinland indicated moderate confidence that the Project will not cause significant adverse effects on marine water and sediment quality in Milne Inlet and Steensby Inlet. In addition, the proponent has concluded that with monitoring and mitigation measures, the Project will not have significant negative effects on sea ice or on the landfast ice regime because of the relatively small amount of ice that will be disrupted. Although there will be some alteration of landfast ice in Steensby Inlet due to unavoidable ice breaking activities, Baffinland concluded that the area of disrupted ice in relation to local and regional areas is small and will not have any consequential effects on the local or regional ice regime.

4.11.2 Views and Concerns of Interested Parties

Marine Water, Sediment Quality and Seabed Effects

Environment Canada (EC) and Fisheries and Oceans Canada (DFO) had concerns regarding the limited discussion or analysis regarding impacts to sediment quality contained in the FEIS. Noting that important inputs such as ship design for the ore carriers have yet to be determined, DFO questioned the reliability of Baffinland's modelling to determine how far disturbed sediments are likely to travel. DFO also indicated that the FEIS did not discuss the effects of changing direction and maneuvering of vessels in shallow areas along the shipping route and did not consider the fate of re-suspended sediment. Accordingly, DFO suggested that Baffinland update the sediment redistribution modelling once ship design has been completed and also recommended that sampling should be undertaken to validate the

model, to inform sampling sites and assist in the development of the the monitoring plan. Further, DFO suggested that the monitoring plan should also include verification of the impact predictions of sediment redistribution attributed to propeller wash in shallow water locations along the shipping route. DFO concluded that if monitoring detects negative impacts from sediment redistribution, Baffinland should be required to develop and implement additional mitigation measures. In Exhibit 2[104] filed at the Final Hearing, Baffinland indicated a willingness to undertake the modelling necessary to confirm these effect predictions in the FEIS.

Environment Canada pointed out in its final Written Submission that that there is potential for contamination of the marine environment to be associated with chronic ship discharges and EC recommended that Project-related vessels use sea water lubricated propeller shaft bearings to eliminate the potential for leakage of oil through stern tubes. Environment Canada further suggested that the design and implementation of a monitoring program for water quality, sediment quality and benthic organisms at the Steensby Port site and at reference locations, as well as an inspection and audit program of project-vessels was required to ensure that Baffinland is able to meet zero discharge standards.

However, during the Final Hearing, EC changed its position with respect to the use of sea water lubricated bearings:

> *Environment Canada recommended that Baffinland consider using sea water and lubricated bearings in the propeller shaft of project vessels to eliminate the potential of leakage of oil through stern tubes, thus reducing the number of potential sources of inadvertent oil leakage. Upon further investigation, this option may not be viable in the Arctic, and we deferred Baffinland and the regulatory authorities to determine ship design.*[105]

Environment Canada also noted that in the absence of information regarding the ship design, the potential extent of areas that may be affected by propeller wash remained unknown and as such it was difficult to comment on the potential significance of this impact. Reflecting this uncertainty, it was recommended by EC that Baffinland design and implement a monitoring program to measure the extent of propeller wash impacts in Steensby Inlet, including changes in benthic communities and fish habitat, in addition to defining a shipping lane within Steensby Inlet that would minimize the likelihood and extent of impacts from propeller wash.

With regards to the monitoring of metals in seawater and sediment, Environment Canada suggested that the Proponent should seek out analytical labs that can provide results even if the levels present are less than the minimimum detection limits set out in relevant Canadian Council of the Ministers of the Environment (CCME) Guidelines for hexavalent chromium (Cr (VI)), trivalent chromium (Cr (III)), arsenic (As) and cadmium (Cd). EC suggested that even when levels are very low, such monitoring results are useful to draw meaningful comparisons between levels over time and to ensure changes are detected at the earliest stages before levels approach CCME thresholds.

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[104] "Baffinland Response to Agency Submissions –Final Environmental Impact Statement – May 30, 2012,"dated July 11, 2012.

[105] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 725, lines 7-15.

For the Milne Port Freight Dock, Natural Resources Canada stated overall the information currently provided in the FEIS is adequate to cover its recommendations; however, NRCan remains available, on an as needed basis, to provide advice on remote sensing of bottom-fast ice to determine the extents, and potential existence of subsea permafrost in Milne and Steensby Inlets. NRCan also stated that it may be able to contribute historical aerial photography and contemporary satellite data records to GIS-based investigations to quantify past rates of change at the Milne and Steensby Port sites.

General Shipping

Several parties, community representatives and members of the public noted that the unprecedented nature and frequency of shipping associated with the Project makes it very difficult to accurately assess this activity and predict the likely effects. As noted by Fisheries and Oceans Canada (DFO), although the year-round shipping route proposed by Baffinland is technically feasible; the testing of the route with ships of analogous size and weight cannot yet be undertaken. DFO noted that deviations in track width and route are to be expected during shipping, but their relative effects on ice, fish, marine mammals and their habitat are not adequately addressed in the FEIS. On this issue, DFO recommended that Baffinland identify places along the shipping route where seasonal conditions (such as weather and ice conditions) and environmental conditions such as the use of areas by marine mammals during sensitive life stages such as pupping or denning, are most likely to require Baffinland to deviate from the nominal shipping route in order to maintain safe passage or mitigate impacts to marine mammals. In addition, to support the improvement of mitigation measures, monitoring programs and contingency measures, DFO recommends all project-related shipping should use vessel monitoring devices to more clearly define the actual shipping lane and its location relative to important marine habitat and areas of significance to marine mammals.

During the final hearing DFO restated its concerns regarding the potential for effects associated with shipping route deviations:

> *DFO recommends that Baffinland needs to identify locations along the shipping route that may necessitate the use of route deviations to address safety concerns and/or support the mitigation of impacts to marine mammals. We note that Baffinland has started to develop draft plans to help answer this question prior to commencement of operations*.[106]

Similarly, the Qikiqtani Inuit Association (QIA) also emphasized that the magnitude of shipping and ice-breaking activities for the Project is unprecedented in Canadian Arctic waters and the potential impacts of shipping and icebreaking are a substantial concern among Inuit. QIA also noted that the shipment of ore through Hudson Strait and Foxe Basin crosses important areas for marine mammals and seabirds. Further, the Qikiqtani Inuit Association identified that there were important information gaps and methodological issues that raised uncertainty regarding the predictions of significance of potential impacts. QIA also indicated that a lack of current baseline information also hampered impact prediction and the design of future monitoring programs. Consequently, QIA urged the Board to seek additional information and further analyses prior to the commencement of commercial shipments of iron ore and to apply the precautionary approach to this component of the assessment. Specifically with respect to

[106] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p .756, lines 4-10.

further baseline analysis, QIA indicated that Baffinland should establish an all-season, inter-annual baseline that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. QIA suggested that this baseline analysis would also require the selection and identification of physical, chemical, and biological community/indicator components and further suggested that the biological indicators should include both pelagic and benthic species but with emphasis on relatively sedentary benthic species such as sculpins.

With respect to any of Baffinland's activities that could potentially affect navigation on navigable waters, Transport Canada (TC) stated that the Proponent must submit formal applications as early as possible in order to obtain required approvals. TC indicated that each specific work will require Transport Canada to be informed of any design, construction, or operational changes, and final detailed design drawings for each proposed work must be submitted to determine the applicability of and requirements under the Navigable Waters Protection Program.

Ice-Breaking

Section 4.12 of this report provides a discussion of the potential for effects of ice-breaking on marine biota, marine fish and marine mammals. For icebreaking impacts on sea ice habitat, the Qikiqtani Inuit Association (QIA) concluded in its Final Written Submissions that a thorough assessment of the impacts of year-round shipping is not possible based on the current level of detail provided by the Proponent in the FEIS. As such, QIA recommended that the baseline for landfast ice be updated using a long-term dataset (28 years) information on inter-annual variation. Further, the QIA requested that updated analysis for pack and landfast ice be synthesized and reported in a management plan (e.g., Shipping and Marine Wildlife Management Plan) and annual sea ice data also be analyzed and incorporated into that plan.

Environment Canada expressed concern that Baffinland had underestimated the potential for lasting and cumulative effects to pack ice, as follows:

> *Environment Canada is of the opinion that Baffinland has underestimated the potential extent of impacts to pack ice in the marine regional study area. Because pack ice is constantly moving with the wind, tides, and ocean currents, there is the potential that each time a ship transits through Hudson Strait and Foxe Basin, it will be encountering new and previously unimpacted flows. Therefore, the cumulative habitat alteration may be much greater than estimated. If ship tracks are not rapidly closed by moving pack ice or if new ice formation within the track is incomplete between successive passages along the same track, then ship tracks may persist for longer than predicted. During freeze-up, it is possible that continuous shipping may delay pack ice consolidation where splitting of pans could accelerate breakup along the shipping route during spring.* [107]

For the communities nearest the shipping route, the ship tracks left by ice-breaking ore carriers were also noted to have the potential to disrupt traditional travel routes between communities as well as marine mammal harvesting activities. As confirmed by Baffinland at the Final Hearing:

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[107] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 728-729, lines 11-26 and line 1.

Direct travel on land-fast ice across Steensby Inlet will be disrupted as a result of the ship track. As a result, detour around the ship's track will be required. And Baffinland has committed to work with the Qikiqtani Inuit Association and communities to implement the best measures to ensure safe travel in the vicinity of the ship track. [108]

Community members not only expressed concern regarding the potential for travellers on the ice to fall into open ship tracks, they were also not convinced that the mitigation measures proposed by Baffinland (in particular, flagging of the open ship tracks and posting of real time ship routing information on the internet) would be effective: "I want to ask: How -- how will I be able to see flags when there's 24-hour darkness? And will there be any internet service in our community so that we can -- our hunters can know in advance when the ships are going to be passing through Steensby Inlet?" [109]

Ballast Water

Fisheries and Oceans Canada (DFO) stated in its comments stated that a very high volume of ballast water will be discharged into Steensby Inlet, which is an area that has never being exposed to year round shipping or received ballast water discharge, over the life of the Project. Consequently, DFO indicated that the discharge of ballast water has the potential for ecosystemic impacts because the ballast water discharged will differ from that of the receiving water and over time, as considerable volumes are discharged, the potential for changes attributable to cumulative effects arises. In DFO's Final Written Submission, several recommendations on this issue were provided, including recommendations relating to Baffinland's selection of ballast water treatment options, the requirement for Baffinland to develop a contingency plan to respond if ballast water treatment is found to be ineffective, the development of a detailed monitoring program to assess effects over time and updated modelling to be completed when the detailed bathymetry of Steensby Inlet is complete.

At the Hearing, DFO re-stated its specific concerns pertaining to ballast water:

DFO recognizes and appreciates the regulations are in place to address invasive species associated with ballast water. Modelling has indicated that a cumulative lens is likely to develop over the life of the project. Given the size of this lens of foreign water with different chemical properties over the life of the project, we do remain concerned that this may result in changes to the marine environment at the discharge point in Steensby Inlet.[110]

Environment Canada (EC) also provided a significant number of recommendations with respect to monitoring and mitigation in relation to ballast water discharges. Specifically, EC recommended that marine environmental effects monitoring includes salinity, temperature, and benthic community composition and productivity within the expected mixing zone for ballast water and at reference locations within Steensby Inlet to measure the extent of potential impacts from ballast water discharges.

[108] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (am), 2012, p. 2072, lines 7-13.
[109] A. Kublu, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2523, lines 7-12.
[110] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 757, lines 1-10.

At the final hearing Environment Canada re-stated its position on the issue of ballast water:

> *Baffinland's ballast dispersal model suggests that a portion of the ballast water will not have completely mixed with ambient sea water by the end of each year. It is uncertain whether, from a cumulative perspective, this would constitute a significant change in the temperature or solidity in Steensby Inlet. This could possibly benthic or pelagic organisms over the life of the project, which, in turn, could have repercussions for organism higher up in the food chain, such as king and common eider, both of which feed extensively on these organisms.*[111]

The Qikiqtani Inuit Association (QIA) concluded that risks from ballast water discharge into Steensby Inlet were not adequately assessed in the FEIS. QIA that there is considerable uncertainty associated with the choice and effectiveness of treatment; the physical, chemical, and biological properties of the released ballast water; and the fate of ballast water once released. QIA indicated that the level of uncertainty prevented a reasonable assessment of the environmental risks posed by ballast water. QIA provided extensive recommendations, including that a full risk analysis regarding ballast water be conducted to assess the adequacy of treatment and implications for the receiving environment, requiring confirmatory sampling of treated ballast water, updated ballast water monitoring and incorporation of ballast water management into the Shipping Management Plan.

Transport Canada indicated that they do have regulations in place that implement standards shown to protect the marine environment from the risks posed by ballast water and pollution from vessels. Further, Transport Canada updated the NIRB regarding changes proposed for the *Ballast Water Control and Management Regulations* which are intended to bring the provisions of the 2004 *International Convention for the Control and Management of Ballast Water and Sediments* into Canadian law and noted that although no timelines have been formally set to implement the changes to the Regulations, amendments will be developed in the near future. To ensure compliance with these requirements, Transport Canada engages in routine enforcement activities, including routine inspections carried out by TC for vessels entering Canada, but can also be directed to respond to concerns, complaints and identified threats.

However, Transport Canada clearly stated that it does not possess the scientific expertise to assess the potential cumulative environmental effects on marine and marine ecosystems and potential impacts from ballast water discharge, as this expertise rests other federal departments, such as the Department of Fisheries and Oceans and Environment Canada. TC has worked with other Federal and international agencies to address ballast water management and has included those Federal Departments that possess the technical information and scientific expertise on cumulative environmental effects on marine and marine ecosystems and potential impacts from ballast water discharge on those working groups.

Considerable concern was expressed to the Board by community representatives, Elders and members of the public at the Final Hearing regarding the potential for effects from ballast water exchange:

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[111] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 725-726, line 26 and lines 1-10.

We have to think about it very carefully. There was one example that reminded me of these things on one of your slide shows. I think it was [slide] 45, ballast water in Steensby Inlet. I don't like that because we have 75 gallons of water at Steensby - which represents Steensby Inlet and 4 gallons representing the use of freshwater. And you have that little test tube. That little test tube will contain the virus, and the virus kills. And it's a big question. How can we eliminate and how best can we eliminate the viruses that will be coming in?[112]

And we keep hearing about -- when we first got here, we keep hearing from the general public the ballast water from the ships is a continuous question being raised over and over again…And through the whole duration of the project, how much ballast water are you going to use? And monitoring of effects, monitoring habitat areas in near areas, what are you going to do if you detect any invasive species in our waters in Steensby Port? If you detect any type of invasive species, what are you going to do with it? What are you going to do about it? And have you looked at any models or information from anywhere else that have used ballast water and how it has affected the immediate environment of the project?[113]

How much of the ballast water will be released on Nunavut water from Europe? If there was an invasive species released, how will it be detected? Is there a way of detecting it? And if there was an invasive species that became in Nunavut water, how will it be removed? Or how will it be dealt with?[114]

<u>Accommodation Barge and Overwintering of Fuel Vessel</u>
With regards to the proposed overwintering of fuel, Environment Canada recommended that Baffinland ensure that spill response plans for the overwintering of fuel vessel should address the tracking and recovery of fuel spills under the ice. Baffinland in its response provided in Exhibit 2 stated that Transport Canada regulations apply to this recommendation, and it includes a response plan.

In its presentation at the Final Hearing, Environment Canada provided the following statement on the topic of spill response:

Environment Canada recommends that Baffinland more clearly define the safest period for fuel shipments in Hudson Strait and Foxe Basin by considering all factors that might limit ability to respond to a spill. In addition to wind and wave data, this includes daylight, icing on vessels, and visibility for aircraft.[115]

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[112] G. Qulat, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 24(pm), 2012, pp. 1799, lines 9-20.
[113] S. Mikki, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, pp. 1170-1171, lines 25-26 and lines 1-9.
[114] K. Arreak, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1159, lines 13-19.
[115] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 729-730, lines 21-26 and line 1.

The QIA recommended that alternative means to overwintering of fuel in water be considered. Although the QIA noted it was understood that fuel storage by other means would likely entail greater land disturbance, provided such disturbance avoids archeological resources, it was the preference of the QIA to have fuel stored on land. Therefore, it should be understood that additional land disturbance would be preferred provided such impacts are effectively managed and would result in reduced impacts in the marine environment (including potential and/or perceived impacts).

With respect to the floating accommodation barges, Transport Canada (TC) has confirmed, based on the information provided by the Proponent, the barge accommodation is considered as a passenger vessel under the CSA 2001 and the regulation under it. TC mentioned that due to the remote location and cold weather environment, it is advised that the barge and all systems be designed suitably for the anticipated ice conditions and so that it complies with the applicable provisions of the Arctic Shipping Pollution Prevention Regulations. Baffinland stated that it noted TC comments

For Overwintering of the fuel vessel, TC mentioned that the Proponent should be guided by the Arctic Council Guidelines for the Transfer of Refined Oil and Oil Products in Arctic Waters where the guidance provides recommendations relevant to working in the Arctic over and above procedures required by regulation. Further EC notes that the Proponent‘s May 15, 2012 risk assessment on over-wintering of fuel vessels, made reference to Transport Canada‘s draft Arctic Waters Guidelines/Standards for lay up of Petroleum Barges in Land Fast Ice and that it should be noted that Transport Canada has not yet approved nor endorsed these draft guidelines, but has committed to doing so in time for the Winter 2013 season.

Sea Ice

On the topic of the shipping route, DFO stated that the final EIS concludes that year-round shipping using the proposed route is technically feasible; however, this has not actually been tested to date. Although the information suggests that deviations in track width and route are expected, their relative effects on fish, marine mammals and their habitat are not adequately addressed in the FEIS. DFO recommended that Baffinland identify places along the shipping route where seasonal environmental conditions and marine mammal occupation may necessitate the use of route deviations to address safety concerns and/or support the mitigation of impacts to marine mammals. DFO also suggested that all Project-related ships should use vessel monitoring devices to allow tracking of vessels in relation to marine habitat and organisms to better define the actual shipping lane and to support the improvement of mitigation measures, monitoring programs and contingency measures.

In responding to DFO’s recommendations, Baffinland mentioned that the FEIS employed "designed-in" mitigation to select a shipping route with consideration of environmental conditions; therefore, the route selected is considered to have a low potential for interaction with marine mammals, except as

noted in the FEIS. However, Baffinland emphasized its commitment to continuous improvement and adaptive management approaches as required for future and ongoing operations. Baffinland suggested that this recommendation be referred to the proposed Marine Environment Working Group for consideration prior to commencement of operations.

Baffinland also stated that ship track location capability will be incorporated into vessel operations, and location information will be available to interested parties, including communities in the area.

During the final hearing DFO restated the concerns that it has with respect to the shipping route:

> *DFO recommends that Baffinland needs to identify locations along the shipping route that may necessitate the use of route deviations to address safety concerns and/or support the mitigation of impacts to marine mammals. We note that Baffinland has started to develop draft plans to help answer this question prior to commencement of operations*.[116]

In its written submission to the NIRB, Environment Canada noted that there is therefore much uncertainty regarding the behavior of the ship's track in pack ice throughout the range of potential conditions encountered during winter shipping. Environment Canada was, therefore, of the opinion that Baffinland has underestimated the potential extent of impacts to pack ice in the marine regional study area. Because pack ice is constantly moving with the wind, tides and ocean currents there is the potential that each time a ship transits through Hudson Strait and Foxe Basin it will be encountering new and previously un-impacted floes and therefore the cumulative habitat alteration may be much greater than 76.5 km^2.

Environment Canada further advised that a precautionary approach would assume that polar bear and seal distribution along the shipping corridor will be altered over the operational life of the project. While Baffinland acknowledged that there was some uncertainty as to whether changes to ice pan size and surface roughness will have negative or positive effects for seals and therefore polar bear, despite this uncertainty, Baffinland ascribed a high level of confidence to its conclusion that shipping would not have a significant impact of polar bear.

Environment Canada recommended that, if the project is approved, the NIRB include conditions in the project certificate that require Baffinland to design and implement, in consultation with EC, the Government of Nunavut and the Qiqiktani Inuit Association, a program to monitor impacts to pack ice, reactions of polar be reactions of polar bear and seals to ice-breaking vessels, and changes in polar bear and seal distribution in Foxe Basin and Hudson Strait along the southern shipping route.

On the topic of Milne Port Freight Dock, Natural Resources Canada (NRCan) stated that it considers the information currently provided in the FEIS as adequate to cover its recommendations; however, NRCan remains available, on an as needed basis, to provide advice on remote sensing of bottom-fast ice to determine the extents, and potential existence of subsea permafrost in Milne and Steensby Inlets. NRCan also stated that it is able to continue to providing advice on potential GIS-based investigation of

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[116] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p .756, lines 4-10.

the historical aerial photography and contemporary satellite data record to quantify past rates of change at the Milne and Steensby Port sites. Baffinland stated in Exhibit 2 that it noted NRCan comments.

The Qikiqtani Inuit Association acknowledged that, while the NIRB is expected to carry out a thorough assessment of the impacts of year-round shipping, it is not possible to do so for sea ice impacts given the current level of detail provided by the Proponent. It was recommended that Baffinland be required to update the baseline for landfast ice using a long-term dataset (28 years), and with information on inter-annual variation.

Transport Canada mentioned within its final written submission that it notes the maritime transportation component for this project will require innovative vessel design for navigating year-round in Arctic waters. A key recommendation is that the Proponent collaborates with Transport Canada as it undertakes the necessary studies to demonstrate that the vessels selected for the Project can safely navigate in the waters of Steensby Inlet, Foxe Basin, Foxe Channel, and the Hudson Strait in ice conditions. In response Baffinland stated that it noted TC recommendations.

Transport Canada also recommended that the Proponent provide measures that will be taken to provide bathymetric information to the vessels using the alternative eastern route in addition to ways in which the information can be shared with Canadian Hydrographic Services (CHS) for future editions of the nautical charts in this area. Baffinland its response provided in Exhibit 2 stated that Bathymetric data has been collected in cooperation with CHS and that it has had preliminary discussions with CHS to support its efforts to expedite the development of new bathymetric charts for the shipping route. Baffinland also confirmed that datasets will be collected in 2013 in co-operation with the CHS to address minor gap in bathymetric information and that it will formalize an agreement with the CHS to develop the nautical charts in 2014.

Ship Wake Effects

With respect to ship wake effects, DFO stated that given uncertainties associated with the shipping route, wake characteristics of the ore carriers and haulout locations of pinnipeds, especially walrus, the modelling results presented in the FEIS may have underestimated the risk given the available information. As a result, DFO recommended that Baffinland develop a monitoring plan to verify the accuracy of its modelling predictions and, if monitoring detects negative impacts from ship wakes, DFO advised additional mitigation measures would need to be developed and implemented, such as re-routing vessels and altering ship speeds.

In Exhibit *2,* Baffinland stated that it is committed to the development and application of a comprehensive Environmental Effects Monitoring Program as described in the FEIS and that it will monitor to verify the wake effect modeling. Baffinland mentioned that the FEIS fully considers potential wake effects and that the modelled zone of influence will be revised as detailed ship design specifications become available; if potential interactions are identified, these will be the subject of appropriately designed monitoring plans and consideration of appropriate mitigation. Further, Bafffinland stated that the review of the monitoring plans would be referred to the proposed Marine Environment Working Group.

At the final hearing DFO restated the following concerns pertaining to ship wake effects:

The ships proposed for the project have the potential to create wake effects on sensitive areas along the shipping route, such as, walrus haul-out. DFO recognizes that details on the ship design and propulsion system have not been finalized, and, as such, we recommend that a monitoring program be developed for these points along the shipping route that have the potential to create ship-wake effects on sensitive areas.[117]

Environment Canada advised the Board that it is satisfied with the additional analysis of potential ship wakes that was provided in the FEIS. Given that wind-generated waves and vessel wakes can be additive, leading to some wave amplification, Environment Canada is of the view that Baffinland should monitor the height of ship generated waves at specific areas of concern during at least the first year of ore-shipping. Environment Canada recommended restrictions on vessel speed during the open water season in areas where the shipping route is <10 km from the nearest shoreline, in addition to noting the need for Baffinland to meet its commitment to conduct shoreline surveys for nesting birds prior to the construction phase and once regular ore shipments commence. Finally, Environment Canada also recommended that environmental monitoring include the placement of additional wave sensors within areas of potential concern to better characterize the natural wave regime and to measure vessel wakes at the shoreline in order to verify model predictions and to determine the efficacy of proposed measures to mitigate vessel wake effects.

Recognizing the potential impacts of ship wake effects on shorelines, Natural Resources Canada stated that it considers the information provided by the FEIS as adequate; however, for the project implementation phase, Natural Resources Canada recommended that Baffinland install tidal gauges at Steensby Inlet, have ore carriers subjected to sea trials to measure wake characteristics and reassess the potential for ship wake impacts to cause coastal change following any further changes to the proposed shipping routes.

In addition, Natural Resources Canada confirmed its commitment to remain available to provide advice on approaches to shoreline change analysis at Milne and Steensby Port sites on an as needed basis.

Based on all available information, it is the Qikiqtani Inuit Association's conclusion that occasional route deviations are likely to occur, and these deviations are more likely to occur due to environmental conditions ("hazards" such as ice, storms, etc.) than in response to a need to participate in Search and Rescue operations (although such deviations are certainly possible). It was noted that Baffinland has made changes to their nominal route to address community concerns (Rowley Island and Mill Island areas), and these alternate routes will be used most of the time. The Qikiqtani Inuit Association explained that it appreciates these changes, but notes that occasional deviations will likely be necessary, and vessels will have to use the route(s) that communities do not prefer at times.

4.11.3 Views of the Board

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[117] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 753, lines 15-23.

In considering the information presented in the FEIS and the representations made by interested parties and community members, the Board views the issues related to the marine environment as some of the most important issues that the Project will need to address moving forward. The NIRB supports the recommendations provided by parties regarding the need for additional sea ice and ship wake modelling, to improve certainty of predictions and associated effects to marine wildlife. Additional assessment of Project activities such as dredging and blasting is also expected to be required, and will assist with mitigating impacts to the local marine environment of Milne Inlet and Steensby Inlet.

The NIRB recognizes that the potential for changes to the local marine environment at Milne Inlet and Steensby Inlet will occur as a result of the Project; the proposed development of port and particularly, the proposed use of Steensby Inlet for development of a deep sea port with year-round shipping, refuelling and ballast water exchange through the life of the Project has the potential to impact upon marine wildlife and marine wildlife habitat immediately and cumulatively, over the long term. The Board acknowledges that Fisheries and Oceans Canada is responsible for approving all allteration, disruption and destruction of marine habitat and for determining the appropriateness of compensation, and that the Proponent will be required to carry out further consultation with local communities regarding these activities, which the Board fully supports. Still, the Board expects that Baffinland will take a proactive approach to minimizing the footprint of its Project and the impacts of all associated activities, even where new construction and continuous operations will fundamentally alter exisiting landscapes.

Baffinland plans to carry out significant amounts of blasting and dredging as part of developing the port sites, and the NIRB has offered a number of recommendations on the advice of parties to offset associated potential impacts. The Board notes specifically that the disposal of marine dredgate was presented as an option within the FEIS, but has not been the subject of assessment by the NIRB or parties as Baffinland's plans have not advanced sufficiently to permit this. As such, the Board expects that prior to authorizing disposal at sea of dredged sediments associated with the Project, Environment Canada will ensure Baffinland's application and associated plans will be provided to the NIRB for assessment and additional recommendations.

<u>Ballast Water</u>

There has been continued concern expressed by the general public and intervenors for the potential for ballast water exchange associated with the project shipping to negatively affect the waters of the Nunavut Settlement Area through the introduction of invasive species, pathogens or changes to local water chemistry. Much discussion focused on current and pending ballast water exchange and treatment regulations, as well as government's role in oversight and enforcement. Reference was frequently made to the historic impacts of ballast water exchange on the Great Lakes, as well as current methods of ballast water exchange and treatment. The potential for cumulative impacts associated with ballast water exchange was highlighted during the hearing by a number of parties:

> *DR. HODSON: So our concern is that the discharge of ballast water over a 20-year period could change -- could lead to changes in salinity or temperature or productivity of the water that could influence organisms that are used as food by birds.*[118]

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[118] J. Hodson, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 746, line 18-22.

MR. MOGGY: In terms of ballast water, Baffinland will discharge 17.1 million cubic metres of ballast water annually into Steensby Inlet.[119]

When pressed by the NIRB, DFO clarified that although the current and pending regulations and international standards are considered adequate, because of the scope and scale of the Mary River project a precautionary approach should be taken with ongoing monitoring to assess project impacts even where such standards are being respected.

Thank you, Madam Chair. Bev Ross, Fisheries and Oceans Canada. We had deferred a question yesterday that came from the Board staff respecting the -- the benefit of, in some cases, going above prescribed guidelines or regulations. The ballast water is typical of this. DFO had made some recommendations that went beyond what would be the minimum requirements of a regulation that Transport Canada was describing that would come into force in the future. The Baffinland project is a large scale project being proposed in a pristine area. There is some limited -- there is limited baseline data and some risks have not been well identified. In cases like this and because of the novel circumstances of the project, we may want to take a more precautionary approach then the routine application of regulations prescribing minimum standards might dictate. This would also be responsive to the concerns that we heard from the Qikiqtani Inuit Association, for example, and other communities.[120]

Within its Closing Statement, Baffinland noted the following:

Respecting ballast water, Baffinland has made detailed commitments in the Shipping and Marine Mammal Management Plan (FEIS, Appendix 10D-IO, Section 4.2 (pages 28-31)) including commitments for ballast water exchange and treatment and for monitoring the ballast water before discharge in the environment. Transport Canada has confirmed that the Canadian regulations and international guidelines are exceedingly stringent. Baffinland has committed to comply with these regulations and the NIRB can require reports on compliance from both Baffinland and from Transport Canada.[121]

The NIRB supports the position put forward by DFO, that is, given the scope and scale of the Mary River project, the current pristine nature of the area where the development is proposed, and the lack of data available for use as baseline information, a precautionary approach must be taken. At times this may mean going above and beyond the routine application of existing environmental regulations when establishing appropriate mitigation for this project proposal. The information collected through project monitoring must be used to supplement existing data gaps, and compared against predictions made within the Final EIS to allow for responsive adaptive management by the Proponent and regulators; while the primary responsibly for adaptive management rests with the Proponent, regulatory authorities must also be more proactive and diligent with regulatory inspections, oversight and enforcement than might be routine for other areas where the same regulations are currently enforced.

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[119] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 756, line 22-24

[120] B. Ross, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, pp. 910-911, lines 17-26 and lines 1-10.

[121] NIRB Final Hearing File No.: 08MN053, Exhibit 66, Baffinland Iron Mines Corporation, Closing Statement, Pond Inlet, July 28, 2012, filed by Baffinland on July 28, 2012.

Overwintering of Fuel

In its closing statement at the Final Hearing, Baffinland highlighted the stringent regulations and requirements for overwintering fuel vessels under the *Canada Shipping Act* which would be administered by Transport Canada. Baffinland noted that it is required to comply with these regulations and the Board could specify that both Baffinland and Transport Canada provide reports on compliance.

The Board recognizes that the Proponent is proposing to overwinter a large quantity of fuel in a fuel vessel at Steensby Inlet once only, during the initial construction of the project while a fuel tank farm is constructed on land for permanent fuel storage associated with the project. While the likelihood of a spill occurring is considered low, the potential impacts associated with a large spill of fuel while overwintering in this marine area would be extremely significant and difficult to mitigate as there is a lack of proven capacity and technology currently available for effective recovery of fuel spilt during iced-over conditions in these area of the Canadian Arctic.

4.11.4 Conclusions and Recommendations of the Board

General

1. The Proponent shall develop a comprehensive Environmental Effects Monitoring Program to address concerns and indentify potential impacts of the Project on the marine environment.

Establishment of a Marine Environment Working Group

2. A Marine Environment Working Group ("MEWG") shall be established to serve as an advisory group in connection with mitigation measures for the protection of the marine environment, and in connection with the the Proponent's Environmental Effects Monitoring program, as it pertains to the marine environment. Membership on the MEWG will include the Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and other agencies or interested parties as determined to be appropriate by these key members. Makivik Corporation shall also be entitled to membership on the MEWG at its election.

   The MEWG members may consider the draft terms of reference for the MEWG filed in the Final Hearing, but they are not bound by them. The MEWG will consult with, and provide advice and recommendations to the Proponent in connection with mitigation measures for the protection of the marine environment, monitoring of effects on the marine environment and the consideration of adaptive management plans. The role of the MEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.

Ice-breaking and Shipping

3. The Proponent shall update the baseline information for landfast ice using a long-term dataset (28 years), and with information on inter-annual variation. The analysis for pack and landfast ice shall be updated annually using annual sea ice data (floe size, cover, concentration) and synthesized and reported in the most appropriate management plan.

4. The Proponent shall provide the Canadian Hydrographic Services with bathymetric data and other relevant information collected in support of Project shipping where possible, to assist in the development of nautical charts for Canadian waters.
5. Prior to commercial shipping of iron ore, the Proponent shall conduct a detailed risk assessment for Project-related shipping accidents, noting areas along the ship tracks where vessels may be particularly vulnerable to environmental conditions such as sea ice, and any seasonal differences in risk. This assessment shall inform mitigation and adaptive management plans.

Shoreline effects and sediment redistribution

6. The Proponent shall reassess the potential for ship wake impacts to cause coastal change following any further changes to the proposed shipping routes.
7. The Proponent is strongly encouraged to have its ore carriers subjected to sea trials to measure wake characteristics at various vessel speeds and distances from the vessel.
8. The Proponent shall install tidal gauges at the Steensby Inlet Port site to monitor relative sea level and storm surges.
9. The Proponent shall update its sediment redistribution modeling once ship design has been completed and sampling should be undertaken to validate the model and to inform sampling sites and the monitoring plan.
10. The Proponent shall develop a monitoring plan to verify its impact predictions associated with sediment redistribution resulting from propeller wash in shallow water locations along the shipping route. If monitoring detects negative impacts from sediment redistribution, additional mitigation measures will need to be developed and implemented.

Ballast Water Exchange

11. Prior to commercial shipping of iron ore, the Proponent shall use more detailed bathymetry collected from Steensby Inlet to model the anticipated ballast water discharges from ore carriers. The results from this modeling shall be used to update ballast water discharge impact predictions and should account for density dependent flow and annual timescales over the project life. Additional sampling should also be undertaken to validate the model and to inform sampling sites and the monitoring plan.
12. The Proponent shall develop a detailed monitoring program at a number of sites over the long term to evaluate changes to marine habitat and organisms and to monitor for non-native introductions resulting from Project-related shipping. This program needs to be able to detect changes that may have biological consequences and should be initiated several years prior to any ballast water discharge into Steensby Inlet to collect sufficient baseline data and should continue over the life of the Project.
13. Prior to commercial shipping of iron ore and in conjunction with the Marine Environment Working Group, the Proponent shall complete a risk analysis regarding ballast water discharge to assess the adequacy of treatment and implications on the receiving environment. This risk analysis shall consider, but not be limited to:
    a. Invasive species;
    b. Seasonal oceanography;
    c. Ballast water quality and quantity;

d. Receiving water quality;

e. Residual physical, chemical, and/or biological effects.

14. The Proponent shall develop and implement an effective ballast water management program that may include the treatment and monitoring of ballast water discharges in a manner consistent with applicable regulations and/or exceed those reguations if they are determined to be ineffective for providing the desired and predicted results.

15. The Proponent shall incorporate into its Shipping and Marine Mammals Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of Ship's Ballast Water and Sediment (2004).

16. The Proponent shall develop a detailed monitoring plan for fouling that includes sampling areas on ships where antifouling treatment is not applied such as the areas where non-native species are most likely to occur.

Spill Prevention

17. The Proponent shall ensure that it maintains the necessary equipment and trained personnel to respond to all sizes of potential spills associated with the Project in a self sufficient manner.

18. Prior to construction, based on vessel selection and if so required, the Proponent shall reassess the risk analysis of using vessel-based fuel storage, including the potential environmental impacts of containment failure under a range of winter ice conditions, how a spill might spread and the impact of fuel if it does not volatilize to the atmosphere.

19. The Proponent shall consult directly with affected communities regarding its plans for over-wintering of fuel in Steensby Inlet, with discussion topics to include descriptions of the duration of proposed activities, vessel type, spill preparedness and emergency response protocols, environmental impact predictions and answers to community member questions.

20. The Proponent shall meet or exceed all regulatory regulations and requirements as apply to the practice of overwintering a fuel vessel in at Steensby Inlet, with reporting to the NIRB and Transport Canada.

21. The Proponent will update the NIRB on the results of all compliance monitoring and site inspections undertaken by government agencies for the overwintering of a fuel vessel in Steensby Inlet.

22. Prior to the commercial shipping of iron ore, the Proponent shall conduct fuel spill dispersion modeling that will, at a minimum, consider:

    a. Modeling of oil spills in the following areas:

        i. Pinch points, including: the mouth of Hudson Strait, the Resolution Island Area, the West End of Hudson Strait and Nottingham Island Area;

        ii. The approach into Steensby Inlet;

        iii. Shallow water and shorelines; and,

        iv. Areas that have been identified as having high flows and/or high concentrations of marine mammals, marine fish or seabirds.

    b. Open water and ice-covered conditions;

    c. Spill volumes up to and including loss of a full tanker cargo; and,

   d. Differences in the quantity and properties of each type of bulk fuel transported by vessels when they are at, or in transit to, the port at Steensby Inlet.

a. The Proponent shall incorporate the results of revised fuel spill dispersion modeling into its impact predictions for the marine environment and its spill response and emergency preparedness plans.

4.12 Marine Wildlife and Marine Habitat

4.12.1 Views of the Proponent

In the FEIS Volume 8, Sections 4 and 5, Baffinland provides its assessment of the potential for effects on marine habitat and biota and marine mammals.

With respect to marine habitat and biota, Baffinland conducted field investigations between 2007-2010 to collect information regarding: the baseline conditions related to the seabed and coastal habitat; primary producers (phytoplankton and attached algae); secondary producers (zooplankton, benthic invertebrates); fish communities and fish populations; fish conditions and the levels of metals in arctic char. Baffinland defined the study area for the purposes of these investigations to be 4 kilometres surrounding the proposed port site at Milne Inlet and 8 kilometres surrounding Steensby Inlet.

Baffinland's assessment of effects on marine habitat and biota considered effects associated with:

- the discharge of ballast water from supply vessels and ore carriers;
- the airborne dispersion of dust;
- the discharge of treated wastewater; and
- potential diesel spills.[122]

With respect to marine mammals, Baffinland conducted aerial surveys periodically during 2006-2008 to document the distribution and abundance of marine mammals in the vicinity of the Milne Inlet and Steensby Inlet port sites and also along potential shipping routes. Baffinland identified that 22 marine mammal species are known or expected to occur in the RSA and along the proposed shipping routes in Baffin Bay and Davis Strait. In choosing indicator species for the assessment, Baffinland considered factors such as the species abundance throughout the Regional Study Area (RSA), the significance of the species to Inuit harvesters and culture and the status of each species in terms of listing (or the prospect of future listing) as a species of concern or species at risk. The indicator species selected by Baffinland for the assessment of potential effects on marine mammal were: ringed seal, bearded seal, walrus, beluga whale, narwhal, bowhead whale and polar bear.

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[122] Although this was considered during the assessment of effects on this Valued Ecosystem Component (VEC), the discussion of potential effects attributed to diesel spills was not included in this section of the FEIS, but was rather discussed in detail in Vol. 9, Section 3 under "Accidents and Malfunctions" and the discussion in this Report is also contained in Section 6.1 of this Report under same heading.

Four primary interactions were considered by Baffinland with respect to the potential effects on marine mammals from routine Project activities: noise (in-water and in-air), collision with vessels, habitat change, and indirect effects from changes in prey.

Baffinland describes baseline conditions for the seabed habitat, coastal habitat, primary and secondary producers at Milne Port and Steensby Port that are consistent with typical conditions in the Canadian Arctic. With respect to the nearshore fish community, in Milne Port, low species diversity and abundance was noted, with only small numbers of andromous arctic char, four species of sculpin accounting for 80% of fish caught and Greenland cod. In Steensby Inlet, the marine fish community near the proposed port is also characterized by low species diversity and abundance, with arctic char comprising greater than 90% of the species netted and some sculpin species present and Atlantic spiny lumpsucker also identified. In terms of the baseline concentrations of metals detected in arctic char tissue, none of the fish sampled from Milne Inlet or from Steensby Inlet had muscle mercury concentrations exceeding the Health Canada commercial export limit.

Baffinland concluded that although the Project will cause a negligible loss of habitat within Project footprints (estimated alteration of less than 0.1 % of nearshore marine habitat at each of Milne and Steensby Inlets due to propwash and other dock side activities) and possibly some alteration or reduction in the productive capacity of habitat around the ports due to vessel operations and ballast water discharge, and avoidance of a small area around the dock sites by some fish species due to underwater noise, the Project will have no significant adverse residual effects on marine fish habitat. Baffinland notes that the potential effects of noise disturbance on biota and benthic productivity due to ballast water discharge are more difficult to define, but may occur over larger areas within the respective Local Study Areas than habitat losses. Baffinland also indicated that Project activities leading to residual effects on water quality (short-term water quality guideline exceedances) would be reversible and related effects on marine habitat (e.g., changes due to ballast water) are also expected to be reversible.

Similarly, with respect to arctic char, Baffinland concluded that although there will be a negligible amount of habitat lost due to infrastructure footprints, and there may be some reduction in benthic productivity associated with ballast water exchange, and some avoidance of an area around the dock sites due to underwater noise, the Project will have no significant adverse residual effects on anadromous arctic char in Milne and Steensby Inlets. Baffinland predicted that these effects would have little effect on the feeding habitat available within Milne and Steensby Inlets and Baffinland indicated the effects are expected to be reversible. Baffinland expects that there will be no direct mortality related to the Project, as there will be an absolute ban on fishing by Project employees. Although Baffinland identifies that there may be low magnitude effects on char health and condition attributed to residual effects on water and sediment quality, these effects are expected to be confined to within the Milne and Steensby Inlet Local Study Areas (Local Study Areas) and Baffinland anticipates that any resulting effects will be reversible and will not lead to elevated concentrations of metals in arctic char.

The baseline information collected to support Baffinland's assessment of the marine mammal indicator species, ringed seal, bearded seal, walrus, beluga whale, narwhal, bowhead whale, and polar bear indicated the following:

- Ringed seals are present year-round along shipping routes from both Milne and Steensby Inlets. Stable landfast ice offers preferred seal habitat for breathing holes and lairs. The seals disperse during open-water periods.

- Bearded seals primarily occur in shallow areas and pack ice. They are seldom found in fast ice areas. They are uncommon in areas of solid fast ice.
- Traditional knowledge indicated that small numbers of walruses are present in Steensby Inlet. Key walrus areas are west of Rowley Island, along the floe edge or on moving pack ice. Walruses also occur in Hudson Strait. Very few are present along the shipping route in Eclipse Sound and Milne Inlet. About half of the footprint of the Steensby Port dock is unsuitable as walrus habitat.
- Narwhal are more common in the northern area of the Regional Study Area. About 20,000 summer in the Eclipse Sound and Milne Inlet area where they are thought to calve and feed. Relatively few narwhal have been present in Foxe Basin. They are thought to overwinter in the eastern portion of Hudson Strait.
- Hudson Strait is an important overwintering area for bowhead whales and north-western Foxe Basin is considered a nursing area. Milne Inlet, Eclipse Sound, and to a lesser degree Koluktoo Bay are used by bowhead whales.
- Polar bears are abundant in northern Foxe Basin including the shorelines of Steensby Inlet and Koch, Rowley and Bray islands. A small number of polar bears are expected to occur in Milne Inlet and Eclipse Sound during the open-water season. Elders have noted that the south eastern portion of Steensby Inlet provides good denning habitat. Polar bears also overwinter in Hudson Strait.

Baffinland indicated that, although project activities such as construction, vessel traffic, ice breaking, and aircraft overflights may cause disturbances to ringed seals and bearded seals, the predicted overall effects of the Project on ringed seals and bearded seals are not significant. Baffinland indicated that acoustic modeling results and mitigation plans indicate both species of seal are not expected to be exposed to sound levels high enough to cause hearing impairment. Baffinland notes, however, that while generally tolerant of on-ice industrial activity and shipping, ringed seals are potentially susceptible to disturbance when giving birth and nursing pups.

Baffinland indicated that as the shipping route does not overlap with landfast ice in Hudson Strait, and only a small portion of the landfast ice edge will be changed at the entrance to Steensby Inlet less than 2% of total landfast ice edge leading into Steensby Port and less than 1% of pack ice in Hudson Strait would be changed as a result of the Project. Baffinland suggests that evidence of the ship track in the mobile pack ice will quickly disappear because of the movement of ice by wind and tides and it is assumed that as a result, bearded seals will re-use the ice. For ringed seals it is anticipated that habitat changes resulting from ice breaking activities will occur only in locations where vessels transit, and the area affected will be quite limited. Mortality from shipping collisions is expected to be limited to effects only in the ice cover season because during the open water season, both ringed seals and bearded seals exhibit localized avoidance and are expected to avoid collisions.

Walrus

Baffinland predicted that although walruses may be disturbed by construction activities, vessel traffic, icebreaking, and aircraft overflights may potentially, the effects of the Project on walruses are not expected to be significant. Evidence indicates that walrus exhibit localized avoidance of vessels and variable responses to aircraft and that the disturbances from these activities are not expected to affect calving areas west of Rowley Island. In addition, walruses are not expected to be exposed to sound levels causing hearing impairment and no mortality of walruses is expected to occur as a result of the Project.

Beluga Whales

Baffinland predicted that habitat change may result from the passing of ore vessels through Hudson Strait when beluga whales over winter in the area, but the change to the pack ice will be only temporary and changes to habitat caused by dock structures and temporary changes to overwintering habitat are below the threshold values chosen by Baffinland and are predicted to be not significant.

Beluga responses to industrial activities are variable. It is predicted that with mitigation measures in place disturbance effects on belugas from construction, shipping and aircraft overflights will not be significant. Beluga whales are not expected to be exposed to sound levels from construction activities that could cause hearing impairment. Overall no mortality of beluga whales is expected to occur as a result of the Project.

Narwhal

The interaction of the Project with the narwhal population is limited to shipping activities in Milne Inlet during the open water season and although small changes in habitat as a result of dock structures at Steensby and Milne Ports will occur, the footprint of these structures is very small in comparison to the available marine habitat in the respective area. In general, Baffinland indicated that disturbance effects on narwhal resulting from construction, vessel traffic, icebreaking, and aircraft overflights with mitigation are not significant. Baffinland indicated there is no clear evidence that narwhals immediately abandon an area transited by a vessel. Further, narwhals are not expected to incur hearing impairment as a result of Project activities and no mortality of narwhals is expected to occur as a result of the Project.

Bowhead Whales

Baffinland predicted that there will be no significant effects of the Project on bowhead whales. Based on studies of bowhead responses to ships and icebreakers, Baffinland anticipates that bowhead whales will likely avoid at least the immediate area around ships. Bowhead whale responses to industrial activity are variable, but Baffinland indicated that with mitigation in place, disturbance effects on bowhead whales from construction, shipping, and aircraft overflights are not expected to be significant.

As it is anticipated that Bowhead whales are unlikely to occur within 25 m of construction activities, hearing impairment resulting from exposure to elevated sound levels is unlikely and similarly, bowhead whales are unlikely to be close enough to ore carriers to suffer from hearing impairment. Consequently, Baffinland anticipates that there will be no significant hearing impairment on bowhead whales as a result of project activities.

Baffinland also predicts that the change in habitat caused by dock structures and temporary decrease in bowhead overwintering habitat will be relatively small. Baffinland also predicts that no mortality of bowhead whales is expected to occur as a result of the Project.

While noting that, on occasion and under some specific conditions, whale species, such as bowhead can be vulnerable to ship strikes along the shipping route,[123] during the Final Hearing Baffinland further

[123] B. Ledrew, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 16, 2012, p. 132, lines 4-6.

explained why the company does not believe that ship strikes on whales would be likely excepting for specific occasions which could be monitored for:

> *"All of the experience indicates that [whales] will move out of the way and that ship strikes are not likely to be a big issue, except for one situation, and that is, for bowhead whales, they have an activity where they are actually socializing. Large groups get together, and they talk to each other and are socializing with each other, and they do this at the surface, and when they are at the surface, the underwater noise that's travelling below the surface doesn't connect well to the surface."*[124]

Polar Bears

Baffinland indicated the interaction of the Project with the polar bear population will be limited and no significant effects on polar bears are predicted. Polar bears might avoid or approach ships and port sites. The change in habitat in landfast ice in Steensby Inlet and Foxe Basin as a result of the Project represents 5.6% and 0.36% respectively of suitable polar bear habitat. The change in pack ice is less than 1% of pack ice in Hudson Strait, Foxe Basin, and near Steensby Port. The FEIS[125] includes a detailed assessment of potential effects of the ship-track (expected to close within hours after the ship passes) on polar bear habitat, and concludes that as the ship-track would be relatively small and transient, the impact is not expected to be significant.

The disturbance effects on polar bears from construction, shipping, and aircraft overflights are expected to not be significant. Although there is always a risk of polar bear mortality as a result of polar bear and human interaction Baffinland proposes to implement mitigation measures to reduce the risk of a bear encounter, thereby reducing the chances that a bear would have to be killed in defense of human life. On this basis Baffinland anticipates that with mitigation, no mortality of polar bears will be associated with the Project.

Baffinland concluded that with the following monitoring and mitigation measures in place, the Project will not significantly affect marine wildlife or marine wildlife habitat:

- Blasting during pupping and nursing periods for ringed seals will be mitigated.
- To reduce sound transmission from blasting, an underwater bubble curtain will, as necessary, be employed.
- Dock structures will be designed to minimize the footprint in the marine environment.
- Icebreaking vessels will control the width of the shipping lane by moving along the same track as much as possible through landfast ice in Steensby Inlet.
- The shipping lane into Steensby Port will be delineated with markers to notify the ship's crew of the boundaries of previous vessel track lines.
- Icebreaking tugs and ore carriers will minimize the area of broken landfast ice at the Steensby Port to the extent possible.
- Vessels will maintain a constant course and appropriate speed.

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[124]R. Davis, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 16, 2012, p. 150, lines 6-15.
[125] FEIS, Vol. 8, Sections 5.1.6 and 5.11.

- Ore carriers will have a modern design that is expected to limit noise output.
- Vessels will minimize idling of engines when docked at Milne and Steensby ports.
- Except during takeoff and landing, Project aircraft will be operated at a minimum altitude of ~450 m over marine areas, when weather conditions allow. In addition, aircraft will be prohibited from flying low over wildlife for passengers to 'get a better look' or for photography.
- Project personnel will be educated about bear safety.
- Strict management of waste will reduce the chances of human-bear interactions.
- Polar bear monitors will be used to ensure worker safety.
- Baffinland will participate with Inuit and other agencies to support monitoring initiatives related to changes in Inuit land-use and harvesting, and associated culture and skills, by sharing relevant data with interested parties.
- Compensation for the loss of mammals and harvesting areas will be included in the terms of the Inuit Impact and Benefit Agreement (IIBA) currently being negotiated with the Qikiqtani Inuit Association.

As part of its Environmental Effects Monitoring Plan, Baffinland has committed to collecting additional data on ship-track changes to pack ice to validate predictions in the FEIS. The program would include monitoring consideration of the potential effect of vessel traffic on polar bear habitat.

4.12.2 Views and Concerns of Interested Parties

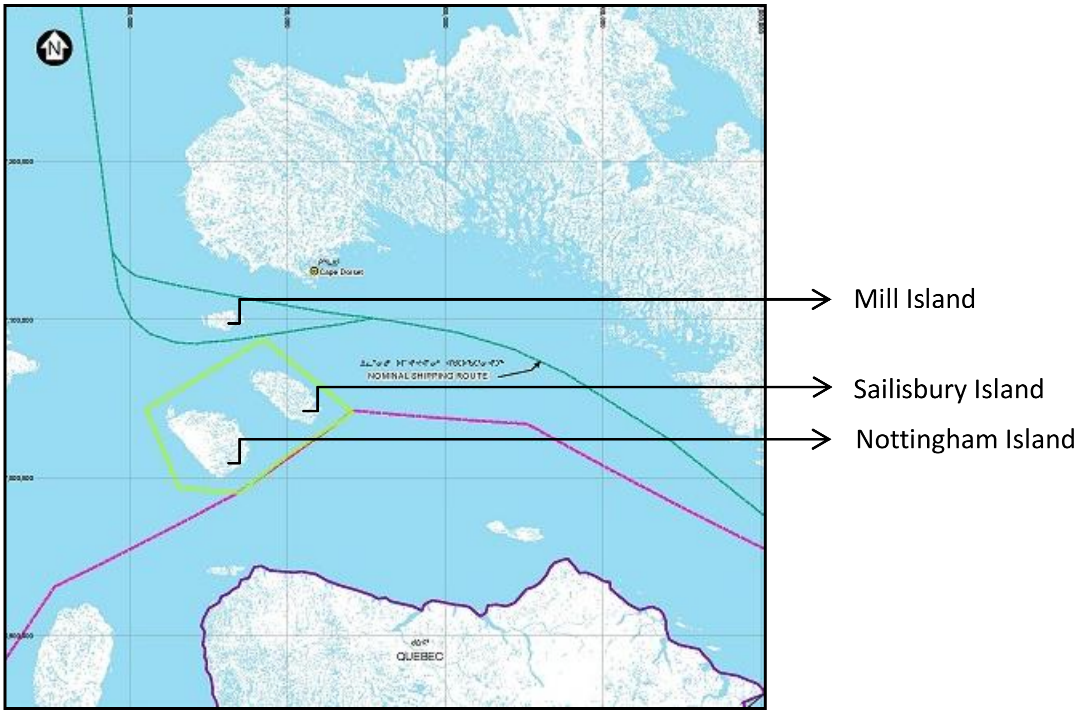
Uncertainty in vessel routing and timing

Although noting that Baffinland has made changes to its nominal route to address community concerns (Rowley Island and Mill Island areas), the Qikiqtani Inuit Association (QIA) also notes that occasional route deviations are likely to occur due to environmental or other emergency conditions and that these route deviations may, at times cause project vessels to use the route(s) that communities do not prefer.

QIA provided a number of recommended mitigation measures for the NIRB's consideration intended to limit the effects of such route deviations on communities, including a requirement for tracking of project vessels in real time and seasonal reporting of ship tracks and sea ice information. In response, Baffinland notes that it anticipates that a web-based tracking program of Project vessels will be used that can be accessed in real-time and that ship track data will be made available to interested parties.

Makivik Corporation also expressed concern that the portion of the shipping route that traverses Hudson Strait, while feasible, is subject to a high degree of uncertainty and will likely need to be modified extensively when vessels are confronted with highly variable ice conditions, tides, currents, other marine craft, or marine mammals which the ships need to avoid. Reflecting this view, Makivik Corporation anticipates that it is highly probably that project vessels will need to deviate from the proposed shipping route and in doing so, enter into the Nunavik Marine Region. As such, Makivik Corporation has recommended that Baffinland undertake more extensive analysis of the shipping route in Hudson Strait, in addition to making vessel monitoring data available to residents of Nunavik to allow parties to assess deviations from the proposed route and the potential for environmental effects to be associated with such route deviations.

Figure 5: Vessel routing options near Mill Island, Hudson Strait[126]



Baffinland's preferred shipping route around Mill Island as communicated through the FEIS was to track south of Mill Island whenever possible, in part to avoid the known walrus haul out location on the north side of the island.[127] During the Final Hearing Baffinland also indicated that the southern route was assessed as an alternative because concerns raised through consultation with the community of Cape Dorset also supported the company's decision to choose the route south of Mill Island. However, at the Final Hearing the company's stated its preference for the shipping route north of Mill Island because it offered a more direct route. In its closing statement at the Final Hearing, Baffinland confirmed its intention to have all fuel supply ships transit to north of Mill Island, with the preferred year-round shipping route for ore carriers also lying north of Mill Island.

> *On the map on the side of the wall over here, we just want to clarify that we have clearly shown the two routes that one route passes north of Mill Island and the other route passes south of Mill Island. We are confident that we can transit both of those routes safely, but as we have said before, our preference, from an operational standpoint, would be to go to the north of Mill Island, but starting on April -- in April of 2010, at a community consultation with Cape Dorset, it was clear to them that they would prefer us to go to the south of Mill Island, so this is a good example of our – of Baffinland responding to community concerns, and at that time, we came up with the alternative to go south of Mill Island, and that's -- those two routes are shown on our map, and they*

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[126] Modified from FEIS Appendix 10-D-10, Figure 2
[127] FEIS, Vol. 8, Section 5.7.2.2, p. 182.

have been shown in our impact statement for a number of years now. So this is the north of Mill Island or south of Mill Island is obviously an important consideration for the Nunavut Impact Review Board, but to state, you know, we have already mentioned that all fuel -- we have committed to any of the fuel hauls that we would do in the summertime would be done north of Mill Island.[128]

We can either go to the north of Mill Island or we can transit through the south of Mill Island, meaning that there wouldn't be any disruption to hunters going from Cape Dorset to Mill Island, so we'll show that map in the next presentation.[129]

However, as articulated by community representatives from Cape Dorset, there is real concern in that community regarding the effects of the northern route being adopted as the preferred route:

Like, if I was to go on the qajaq, I can paddle from Cape Dorset to Mill Island that's how close it is, but after that once you start operating the shipping and using it at a shipping route, we won't be able to do anymore. I'm just saying that that area, it's our access as hunters. It's not about myself. It's about my children and my grandchildren. I'm concerned about them. This is my concern.[130]

...but the ship is going to be passing through quite close to Cape Dorset, but during the fall, that's exactly where we go out hunting before the ice really freezes over. That's when it's the best hunting season, but that's exactly where your ship is going to go through. I'm just wondering if you have other options or other routes that you might reconsider to move away a little bit from our community.[131]

The route for fuel supply vessels (and preferred for ore carriers) north of Mill Island is approximately 41.5 km away from Sailisbury Island, an area of equal use and occupancy for Inuit of Nunavut and Nunavik. As noted by Makivik Corporation in its written submission, the route north of Mill Island keeps the ships further away from the Nunavik Marine Region.

Some of Makivik's concerns would be reduced by the adjusted of the shipping route to the north of Mill Island.[132]

Before we leave the topic of shipping route, I wanted to also ask you whether, again, some of Makivik's concerns may be reduced, again, not eliminated, but reduced, if, in particular, the fuel ships to supply the mine site remain to the north of Mill Island and

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[128] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, pp. 1124-1125, lines 15-26 and lines 1-11.
[129] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, pp. 990-991, line 26 and lines 1-4.
[130] A. Nuna, Cape Dorset resident, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 1085, lines 17-24.
[131] Z. Ejetsiak, Cape Dorset, Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 990, lines 11-19.
[132] G. Gilbert, Makivik Corporation, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 930, line 1.

only shipped during the open water season, so ice was not a factor. Would -- would that reduce Makivik's concerns?[133]

Gregory Gilbert, Makivik Corporation. To some degree, yes, but we also have to acknowledge that the open water season, especially in the fall, coincides with marine mammal migration out of Hudson Strait so that there would be fuel tankers within Hudson Strait and, despite the fact that they might be north or south of Mill Island, there still is potential for catastrophic damage upon marine mammals during this period.[134]

In its final written submission to the NIRB, Fisheries and Oceans Canada explained that the available information indicated that walrus in northern Hudson Bay and Hudson Strait are thought to belong to a different stock than those in Foxe Basin, with the distribution of walrus between seasons appearing more dynamic in Hudson Strait than in northeastern Foxe Basin. Fisheries and Oceans Canada further noted that the Hudson Strait area includes significant haulout areas (summer) around Nottingham, Sailisbury and Mill islands. A concern was subsequently raised that difficult conditions around Mill Island, which is a "choke" point along the shipping route in western Hudson Strait, created the potential for shipping route deviation which could impact upon important walrus habitat.

> While the ships will pass south of Mill Island whenever possible to avoid the known walrus haulout on the north side of the island, no ice data were presented in the final EIS to assess the frequency with which ships would have to pass by the north-side haulout. The north shore of Hudson Strait is used by walrus in summer but, more importantly, is key wintering area. The area is highly productive and contains important walrus feeding areas.[135]

Vessel disturbance to marine mammals

Considering the high risk of effects of the project on even a small number of individuals for several marine mammal populations already of particular conservation concern, Fisheries and Oceans Canada has strongly recommended that a well-designed, long-term monitoring program be implemented to verify impact predictions, demonstrate the efficacy of mitigation measures and determine if the selected mitigation measures can be altered to improve efficiency and effectiveness, particularly in Hudson Strait during the winter period of high occupancy. While noting that Baffinland has committed to implement such a program, Fisheries and Oceans Canada (DFO) indicated that Baffinland has not demonstrated that the program proposed to date will be effective in detecting less-than-extraordinary impacts.

DFO notes that Baffinland's impact predictions for vessel-related noise effects are based on marine mammal density estimates, noise models, predicted vessel transit times and speeds, and thresholds that may not be biologically appropriate, further identifying that given the uncertainty surrounding these factors there is considerable uncertainty associated with the resulting impact predictions (see DFO's DEIS Technical Comments D-07, D-21, D-25, D-33, D-34, D-35).

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[133] K. Bergner, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 930, lines 16-23.
[134] G. Gilbert, Makivik Corporation, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, pp. 930-931, lines 24-26 and lines 1-6.
[135] DFO, Final Written Submission, May 30, 2012, pp. 59-60.

Reflecting these concerns, DFO made the following recommendations: that Baffinland develop an "early warning" monitoring protocol (not just limited to acoustical monitoring) that considers the short and long term cumulative effects of vessel noise on marine mammals; that thresholds be developed to identify when negative impacts are occurring; and that migitation and adaptive management practices be adopted to restrict negative impacts, including identification of zones where biophysical features may mitigate noise effects and taking this information into account in planning vessel transits.

Community concerns about ringed seal focused on potential disturbances from the Project caused to ringed seal pups on landfast ice, and concerns over walrus focused on their potential displacement and disruption along the shipping route and dock in Steensby Port.

Impacts to fish

At the Final Hearing, based on prior experience witnessing impacts (arctic cod being attracted to open water created by ice breaking) while with the Canadian Coast Guard service, a representative from Nunavut Tunngavik Inc. identified that the potential for project shipping to impact on arctic cod should have been considered by Baffinland in its assessment of impacts to marine fish. Although Baffinland had considered potential impacts in Steensby Inlet on marine habitat and biota, an overall assessment of project shipping on arctic cod was not completed as part of the FEIS.

Ballast Water

Fisheries and Oceans Canada (DFO) also indicated that the risks from ballast water discharge into Steensby Inlet were not adequately assessed in the FEIS. The choice and effectiveness of treatment; the physical, chemical, and biological properties of the released ballast water; and its behaviour once released remain uncertain and this level of uncertainty is too high to permit a reasonable assessment of the environmental risks posed by ballast water.

On this basis, DFO made several recommendations with regards to additional ballast water assessment, specific to potential impacts on marine wildlife, including that a risk analysis e completed to assess the adequacy of ballast water treatment and the implications on the receiving environment; requiring treatment and confirmatory sampling of ballast water to confirm it meets discharge criteria prior to release; additional and updated modelling of ballast water; and incorporating ballast water discharge monitoring and management plans into the Shipping Management Plan.

Interactions with marine mammals

DFO concluded that Baffinland's conclusion of negligible effects of shipping on marine mammals is unsupported by the data at hand, and not precautionary. DFO was also critical of Baffinland's relatively limited proposed mitigation measures and surveillance monitoring characterized by DFO as being highly inefficient in reducing potential impacts on marine mammals. DFO's own analysis indicated that impacts from the shipping component of the proposed project on marine mammals are likely to be significant.

Community consultations about beluga whales noted that shipping might frighten them and that they potentially move closer to shore in response to ships. With respect to effects on narwhal community concerns focused on the potential negative effect of shipping on them (e.g. effects on narwhal hearing, ship strikes, etc.). Communities also expressed concern about potential Project effects on bowhead whales, and vessel collisions and the potential for increased mortality to affect community quotas were raised.

Vessel collisions with bowhead whales

DFO concluded that the mitigation measures proposed in the FEIS to monitor interactions or avoid/reduce potential impacts of shipping on marine mammals are insufficient and inadequately described. DFO expressed concern that several already-vulnerable populations would be at risk of ship strikes and would be exposed to noise with potential consequences to their health, behaviour, and habitat use.

In DFO's written submissions several recommendations were provided regarding further development and implementation of mitigation measures to reduce the potential for interaction with marine mammals, as well as requirements for a well-designed, long-term monitoring program to verify impact predictions and to demonstrate the efficacy of mitigation measures and inform adjustment of mitigation measures.

The Qikiqtani Inuit Association (QIA) also contends that Baffinland provided no quantitative evidence to support its assertion of minimal risk of vessel collisions with bowhead whales. Consequently QIA recommended that sufficient marine mammal observer coverage be provided on project vessels to ensure that collisions are observed and reported over the life of the project. Parties also recommended that even incidental contact with bowhead whales or any other marine mammals be reported immediately to Fisheries and Oceans Canada.

A considerable amount of discussion was devoted to this issue during the Final Hearing, with several parties providing their views after DFO provided an annual estimate of the number of whales potentially struck by ore carriers during project shipping:

> *Using available data, DFO estimated that number the whales potentially injured seriously or killed each year through being struck by an ore carrier, while on the wintering grounds, could be up to 5 bowheads, 30 narwhals, 14 beluga.*[136]
>
> *Makivik is concerned that there is a high likelihood of the negative interactions between the ore carriers and other vessels and marine mammals. The onboard observers on only some vessels and the inability of a large vessel to maneuver will result in ship strikes. Baffinland Iron Mines have underestimated the probability of collisions with marine mammals.* [137]*(FH Transcript Jul. 19, p. 918, line 18)*

When questioned regarding the likelihood that avoidance by whales will limit ship strikes, DFO responded:

> *With regards to whether or not the whales avoid vessels, Fisheries and Oceans has said that there are likelihoods that animals, such as beluga and narwhal, will move out of the way of vessels, and I don't disagree with the proponent's assertion that it's probable that most bowheads will move out of the way, but our bottom line has always been that there remains a risk of vessel strike because of the number of vessels moving through*

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[136] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 764, lines 5-10,

[137] A. Alaku, Makivik Corporation, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 918, lines 18-25.

this area; our lack of knowledge, in some cases, of where there might be aggregations of whales. We have argued based on the monitoring and mitigation measures that we have seen so far in the drafts that we may not, on board ships, be able to detect a whale or an aggregation of whales ahead of a moving vessel, so while the numbers that we estimate may be high and we suggest that may be the case, we think further study is needed to get a better handle on what the risk is and what the responses of the animals are, if they are all truly moving out of the way, and most importantly, if possible, perhaps some better ways to mitigate the risk of these large ships moving through areas where bowheads may be feeding or, as Baffinland alluded on the first day, involved in social aggregations or clusters at the surface and ignoring, perhaps, risks approaching in and around them, like large ships.[138]

The potential for mortality associated with ship strikes to affect the allowable harvests for whale species was also raised as a concern at the Final Hearing:

MR. ALAKU: Adamie Alaku, Makivik Corporation. I have a question. Will mortality from any direct or indirect shipping or ship strike affect total allowable takes for northern harvesters?

MR. MOGGY: Derrick Moggy with Fisheries and Oceans Canada. Any incidental harm would have to be taken into account when setting management objectives.[139]

However, based on questioning from the NIRB,[140] the Canadian Coast Guard experience in the Arctic suggests that ship strikes of marine mammals may in fact be an uncommon occurrence: "So from HQ, since the implementation of the Free Safety Management System in 1998, we have no reported incidents of marine mammal strikings with the Canadian Coast Guard ships."[141]

Different views were also expressed by members of the public regarding the likelihood that whales would in fact move out of the way of passing ships, and for some Inuit, there remains considerable scepticism and distrust in the numbers presented by DFO with respect to whales.

Having noted some previous government biologist speaking, I just had -- I just couldn't -- I just had to take a dig. Inuit -- with Inuit, nothing is in seclusion. We have a holistic view, and, in some cases, scientists have very narrow view, very categorical, so when they say they're not unsure of [Inuit Qaujimjatuqangit], I'm really quite skeptical of biologists who are new to their job and who haven't been involved with [Inuit Qaujimjatuqangit].

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[138] J. Lawson, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, pp. 794-795 at lines 17-26 and lines 1-16.,

[139] Question by A. Alaku, Makivik Corporation and answer by D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 811-812, lines 23-26 and lines 1-4.

[140] "Can the Canadian Coast Guard please clarify whether it reports any whale strikes by its ships, and if so, how many ship strikes has it encountered per year struck in the Arctic?" R. Barry, NIRB, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 836, lines 9-12.

[141] P. D'Arcy, CCG, NIRB Final Hearing File No.: 08MN053 Transcript, July 24, 2012, p. 1682, lines 14-18.

Enumeration is quite possible, if you understand the language. You can look at the prefix of the word, the suffix, or a combination of views to enumerate the numbers of animals. Just in the last few years, Inuit have been proven right with respect to beluga, narwhal, and bowheads. When we first started the Land Claim, DFO insisted there was less than 700 bowheads. Inuit disagreed. In the last few years, the population estimates have now been revised to over 40,000 bowheads. Same could be said for narwhal in the high Arctic. At last count, I believe there were -- numbers were over 45,000, just for the north Baffin.[142]

Mitigation and monitoring of Project impacts in Steensby Inlet

The Qikiqtani Inuit Association (QIA) indicated that Baffinland's impact predictions for activities in Steensby Inlet are based on limited baseline data and untested assumptions in many cases, and there is uncertainty with respect to the mitigation options and the ability to design and implement effective monitoring programs for adverse impacts. Consequently, QIA provided a number of very detailed mitigation and monitoring recommendations in their final written submissions related to updating and improving upon available baseline information, monitoring and mitigation plans.

Ship Wake Effects

Baffinland indicated that ship wakes are not likely to cause any measurable erosion or habitat alteration along the proposed shipping routes and that there was unlikely to be an interaction between ship-generated wakes and walrus or seals. However, the Department of Fisheries and Oceans Canada (DFO), indicated that due to uncertainties associated with the shipping route (e.g., deviations), wake characteristics of the ore carriers and haulout locations of pinnipeds especially walrus, the modelling results presented in the final EIS may have underestimated the risk of wake effects. To address this uncertainty, DFO recommended that Baffinland develop a monitoring plan to verify the accuracy of the modelling predictions and if monitoring detects negative impacts from ship wakes, develop additional mitigation measures, such as re-routing vessels and altering ship speeds.

Marine Fish and Benthos

DFO indicated that Baffinland's assessment of potential effects on marine fish and benthos did not consider seasonal effects associated with ore dust deposition accumulation on ice in the fall through to spring melt resulting in ore dust that has accumulated on the ice being released into the water en masse. DFO has concerns this seasonal effect could result in higher instantaneous rates of dust exposure in down-current areas and could affect egg survival for species that hatch in the spring, such as sculpins.

DFO disagrees that the magnitude of habitat loss at Steensby Inlet will be negligible because the estimate of the affected area does not include habitats that will be impacted by resuspended sediments from vessel traffic, construction or dredging. DFO also indicated the calculation is based on the total area and is not broken down by depth strata or habitat types and some habitat types could face considerably larger relative impacts than others, which could affect the significance of these potential effects.

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[142] M. Arreak, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 28 (am), 2012, pp. 2589-2590, lines 22-26 and lines 1-15.

DFO indicated that methods used to collect baseline data on marine invertebrates, marine fishes and habitat were inadequate and need to be improved to provide the baseline data necessary for predicting Project-related impacts and developing mitigation measures and monitoring plans. Reflecting these concerns, DFO recommended that Baffinland establish key locations (transects) outside the Project infrastructure footprint area to collect baseline and develop a long-term monitoring plan, focusing on areas where potential impacts are most likely to occur.

Marine Mammals – Cumulative Effects

DFO also expressed the opinion that Baffinland has underestimated the risk of adverse environmental effects to marine mammals, and that there is a high level of uncertainty in the significance of residual environmental effects predicted for marine mammals. In addition to uncertainties regarding effects predictions, DFO also expressed concerns regarding the adequacy and efficacy of planned mitigation and monitoring plans to address effects. Consequently, DFO made a number of recommendations for managing cumulative effects on marine mammals. Using walrus as an example, the following measures were recommended:

Fish Habitat No Net Loss Plan – Marine

As conceded by Baffinland Project development will result in the “Harmful alteration, disruption or destruction (HADD) of fish habitat” (as that term is used under the Fisheries Act) in both the freshwater and marine environment. In the marine environment specifically, Baffinland predictedthe HADD will result from the construction of the port infrastructure at Steensby Inlet and Baffinland has presented DFO with a Fish Habitat Off-Setting Plan in which Baffinland has proposed the creation of “blunt gaper habitat” to compensate for the loss of marine fish habitat. This option involves the deposit of fine grained material in nearshore, low energy habitats sheltered from waves and other erosive forces. The concept of creating blunt gaper habitat is new and has not been done before.

DFO has expressed reservations regarding this proposed action, indicating that there is a high degree of uncertainty in the implementation and success of this compensation option. DFO noted that low energy sheltered habitats within Steenby Inlet are depositional areas and will likely already have fine grained sediments colonized by blunt gaper if the area is suitable and the creation of additional depositional areas would then have to involve the construction of breakwaters and other structures to hold the fine grained materials in place. The construction of these breakwaters and the deposit of fine sediments may also result in a HADD of the existing substrate on the sea bed. Consequently, DFO recommendsed that Baffinland continue to explore off-setting options in both the freshwater and marine environment to offset the HADD, using community consultation to assist in determining acceptable optinos.

Potential for marine mammal mortalities to affect harvesting quotas

As noted under the discussion of concerns about whale strikes, a number of participants at the Final Hearing express concern that project-related marine mammal mortalities (including mortalities to polar bears and whales), could reduce the harvesting quotas for adjacent communities.[143]

[143] See for example L. Idlout, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 25 (pm), 2012, pp. 1938 and 1943 and the responses of P. Hale, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012, p. 2271 (with respect to polar bears) and D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012, p. 2344 (with respect to whales).

Blasting
Fisheries and Oceans Canada (DFO) and the Qikiqtani Inuit Association expressed concern that the allowable blasting pressure set out in the DFO Guidelines of 100 kPa for blasting near waters frequented by fish may not be sufficiently protective in Arctic conditions and indicating that a more appropriate threshold may be 50 kPa for blasting under ice.[144] Baffinland has indicated that rather than a specific limit being imposed at the assessment stage, that this issue should be addressed in the regulatory stage (water licensing and DFO permitting).

Polar Bears
During the hearings in Iqaluit, there was conflicting evidence from Baffinland, the Government of Nunavut (GN) and the public regarding the potential for impacts to polar bears from the proposed project shipping. The GN questioned Baffinland's conclusions of "no significant impact" and indicated that this conclusion is not supported by the analysis provided in the FEIS, and also disagrees with the level of confidence assigned to this conclusion by Baffinland. GN did not, however, provide any of its own predictions about potential project impacts to polar bear, but rather recommended that a precautionary approach be applied to monitoring, and based on monitoring results Baffinland should be required to implement adaptive management measures.

Community members also had concerns about potential indirect effects of shipping on polar bears as shipping may have effects on polar bears prey and redistribution of prey may cause polar bears to seek food in other areas such as nearer to communities.

4.12.3 Views of the Board

Vessel routing
Baffinland intends to have project vessels transiting to Milne Inlet during the open water season only, primarily during the initial years of construction in order to deliver equipment and materials. As such, while there is the potential for short term disturbance to marine wildlife during transits, no long term effects are expected in this general area.

The NIRB notes that Baffinland's proposed shipping route through the Foxe Basin and Hudson Strait does not overlap with areas of landfast ice in Hudson Strait, while a small portion of the landfast ice edge at the entrance to Steensby Inlet would be impacted. The Board also recognizes Baffinland's commitment to limit the width of the shipping lane during icebreaking and to move along the same track as much as is possible through land fast ice in Steensby Inlet. However, in the Board's view given the frequency of the proposed shipping and the concentrated area of the ship track, it appears likely that seals in the immediate area of Steensby Inlet would encounter sensory disturbance from shipping noise and associated ice-breaking. The Board agrees with the concerns expressed by Elders and harvesters, as well as Fisheries and Oceans Canada (DFO) that this sensory disturbance, particularly during vulnerable periods such as during pupping, is likely to cause avoidance of these impacted areas and may render it unusable as habitat for seals. At other areas of the shipping route, particularly near Mill Island, project ships would pass within relatively close proximity of landfast ice and may cause

[144] See S. Williamson Bathory, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 511 and D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 752.

disturbance to walrus. The Board notes that DFO indicated walrus may be particularly susceptible to visual disturbances even when ships are only perceived as distant objects on the horizon.

As noted in the preceding section, several parties raised concerns regarding the potential variability of the shipping route to be used by Baffinland, given unanticipated environmental conditions or other factors, and the associated uncertainities that this could create. Baffinland has made it clear that ships can navigate safely to the north or to the south of Mill Island, however its preference would be to route project vessels to the north of Mill Island because it is a more direct route to Steensby Inlet, and would help to lessen concerns raised by Makivik Corporation regarding the transport of fuel in areas near the Nunavik Marine Region, or more specifically near Salsibury Island, an area of joint use and equal occupancy for the Inuit of Nunavut and the Inuit of Northern Quebec (Nunavik). However, the Board also notes that the north shore of Hudson Strait is used by walrus in summer and, importantly, is key wintering area. The area is highly productive and contains important walrus feeding areas.

The NIRB does not accept the rationale presented by Baffinland for preferring the shipping route north of Mill Island in order to reduce shipping time and address concerns raised by Makivik Corporation regarding the proximity of this route to the Nunavik Marine Region and areas of equal occupancy. The shipping route south of Mill Island appears to be further removed from important walrus habitat and is much less likely to cause disturbance to walrus and Inuit harvesters from the community of Cape Dorset. The concern expressed by Makivik Corporation itself appears to be predicated on the potential for an accidental fuel spill causing impacts to marine mammal species occurring through Hudson Strait and harvested by the Inuit of Northern Quebec, rather than a concern regarding shipping proximity to Sailisbury Island specifically and if a fuel spill were to occur, whether during transit to the south or north of Mill Island, arguably Makivik's concerns about the potential for widespread impacts on the marine environment would be very much the same.

<u>Shipboard observers</u>

Through the course of the hearing, Baffinland provided an outline of the proposed on-vessel monitoring program in which Inuit monitors would board an ore carrier twice per month at Steensby during March to October to act as "marine mammal observers." In early November and late February one team would board the vessels and no observers would board in December and January due to darkness.[145] Baffinland believes that this monitoring schedule would yield surveillance level results covering one transit per week in the study area during the period of the year when conditions would permit observations.

However, the Board finds Baffinland's proposed schedule and use of marine mammal observers to be insufficient to achieve the required level of monitoring for preventing marine mammal disturbance and potential ship strikes resulting from project shipping. Shipboard observers are expected to assist in identifying marine mammals, seabirds and other users transiting or harvesting in marine areas. While the Board recognizes that there are inherent limitations on the effectiveness of marine mammal observers during the winter months when conditions prohibit observations, the need for constant vigilance to prevent impacts to marine mammals, seabirds and people during all seasons is clear.

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[145] NIRB Final Hearing File No.: 08MN053, Exhibit 66, Baffinland Iron Mines Corporation, Closing Statement, Pond Inlet, July 28, 2012, filed by Baffinland on July 28, 2012.

Further, as the NIRB notes that Baffinland is intending to have the ore carriers for the Project custom built, the NIRB believes that the role of shipboard observers in Baffinland's operations should be taken into consideration, with climate controlled stations and shipboard lighting designed to permit visual sightings by shipboard observers during all seasons and conditions.

Ship strikes

The Board notes that there is considerable disagreement about the likelihood of ship strikes on marine mammals, particularly whales such as narwhal, beluga and bowhead. Baffinland predicted no impact to marine mammals from ship strikes, while DFO's modelling predicts potentially large numbers of strikes resulting in numerous kills each year for the life of the Project. The Proponent is relying on prpfessional judgement and experience with other operating projects incuding one study from operating projects in the Beaufort Sea, while DFO's results were based on a statistical model which presumes whales would not attempt to move out of the path of an approaching ship. In addition, the Board heard evidence from the Canadian Coast Guard with regards to CCG operations in the Arctic indicating that there have been no reports of ship strikes since reporting began in 1998.

The NIRB notes that, in addition to the employment of marine mammal observers onboard project ships, Baffinland has committed to enforcing maximum speeds on project ships, carrying out additional surveys to identify any areas along the shipping route where bowhead whales congregate, and moving the shipping route as may be necessary to prevent impacts from occurring.

Given the corresponding predictions for potential disturbance and avoidance of areas where project ships are transiting through waters of the Nunavut Settlement Area, it is the Board's view that these measures provide a reasonable approach to mitigating the potential for ship strikes with whales. However, continued baseline data collection through a stringent monitoring and adaptive management program will be required in order to reinforce and verify predictions to ensure strikes are prevented. Local users of the marine area located in communities along the shipping route will need to be engaged throughout the life of the project to assist with monitoring and evaluating potential project-induced impacts and to identify any changes to marine mammal distribution.

Bowhead Whales

The Board notes that Baffinland has committed to conducting a survey to identify the occurrence and location of any bowhead near the proposed shipping routes and to identify any sites along the shipping route where bowheads may congregate

Marine mammal impacts and Inuit harvesting

As discussed in section 4.10.3 of this report, like terrestrial wildlife, most marine wildlife populations in Nunavut are subject to harvesting by Inuit, and it is therefore recognized that impacts to population levels have the potential to affect Inuit harvesters. The same holds true for those marine wildlife species whose populations are harvested by both Inuit in the Nunavut Settlement Area and Inuit of Nunavik, Northern Quebec. It must also be recognized that any project-induced mortalities to wildlife species subject to total allowable harvest limits(e.g. polar bear, bowhead whale, etc.) will have the potential to affect the harvesting quotas established for communities within the Nunavut Settlement Area. The same holds true for those species which are harvested by both Inuit in the Nunavut Settlement Area and Inuit of Nunavik, Northern Quebec.

Although the right of Inuit to harvest wildlife throughout the Nunavut Settlement Area is enshrined in the Nunavut Land Claims Agreement, allowing harvesting of wildlife in all project areas by Inuit employees creates the potential for negative impacts to human health and safety, wildlife population

levels and associated ability to harvest by surrounding communities. Given that Baffinland is committed to having provisions in place which would allow for Inuit employees to return to their home communities to participate in harvesting without penalty or effect to their employ at the mine the Board believes that the potential negative impacts of allowing harvesting in project employees in project areas outweigh the benefits of these employees following traditional pursuits.

Blasting and dredging
The Board finds that there is sufficient protection in place with existing guidelines such that a more stringent level can be determined to be required through licensing and permitting.

Polar Bears
Baffinland has committed to collecting additional data on ship track effects in pack ice to validate predictions in the FEIS regarding the potential for effects on Polar Bears as part of the Environmental Effects Monitoring Program. The program will include consideration of the potential effect of vessel traffic on Polar Bear habitat.

4.12.4 Conclusions and Recommendations of the Board

Supplemental Baseline Assessments

1. The Proponent, working with the Marine Environment Working Group, shall consider and identify priorities for conducting the following supplemental baseline assessments:
    a. Establish an all-season, inter-annual baseline in Steensby Inlet that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. This shall include the selection and identification of physical, chemical, and biological community/indicator components. The biological indicators shall include both pelagic and benthic species but with emphasis on relatively sedentary benthic species (e.g., sculpins).
    b. The collection of additional baseline data in Steensby Inlet on walrus, beluga, bearded seal anadromous Arctic Char abundance, distribution ecology and habitat use.
    c. Enhance baseline data on marine wildlife (fish, invertebrates, birds, mammals, etc.) and to provide more details on species abundance and distribution found in the Project area. This shall include, but not be limited to the following:
        i. Aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet and at appropriate control location;
        ii. Shore-based observations of pre-Project narwhal behaviour in Milne Inlet.
    d. Enhance the baseline for affected freshwater systems, which includes control sites to detect Project-related changes before they cause significant harm.
2. The Proponent shall update its Shipping and Marine Wildlife Management Plan, to include avoidance of polynyas and mitigation measures designed for potential fuel spills along the shipping lane during the winter months, with consideration for the impact of spilled fuel on

marine mammals when they might be less mobile or able to avoid contact with spilt fuel or fumes.

Monitoring

3. The Proponent shall incorporate into the appropriate monitoring plans the following items:
    a. A monitoring program that focuses on walrus use of Steensby Inlet and their reaction to disturbance from construction activities, aircraft, and vessels.
    b. Efforts to involve Inuit in monitoring studies at all levels
    c. Monitoring protocols that are responsive to Inuit concerns
    d. Marine monitoring protocols are to consider the use of additional detecting devices to ensure adequate monitoring through changing seasonal conditions and daylight
    e. Schedule for periodic aerial surveys as recommended by the Marine Environment Working Group.
    f. Periodic aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet, and a suitable control location. Surveys shall be conducted at an appropriate frequency to detect change inter-annual variability.
    g. Shore-based observations of pre-Project narwhal behaviour in Milne Inlet
    h. Conduct landfast ice monitoring for the duration of the Project Operations phase, which will include:
        i. The number of ship transits that are able to use the same track; and,
        ii. The area of landfast ice disrupted annually by ship traffic.
    i. Monitoring strategy focused on assessing and mitigating interaction between humans and wildlife at the port site(s).

Traffic Log and Shipping Information

4. The Proponent shall ensure that routing of project vessels is tracked and recorded, with data made accessible in real time to communities in Nunavut and Nunavik. A summary of all ship tracks shall be submitted annually to the NIRB.
5. The Proponent shall report annually to the NIRB regarding project-related ship track and sea ice information, including:
    a. A record of all ship tracks taken along both shipping routes covering the entire shipping season;
    b. An overlay of ship tracks onto ice imagery to determine whether ships are effectively avoiding shore leads and polynyas;
    c. A comparison of recorded ship tracks to the expected nominal shipping route, and probable extent of year-round shipping during periods of ice cover and open-water;
    d. An assessment of the level of adherence to the nominal shipping route and the spatial extent of the shipping zone of influence; and
    e. Marine bird and mammal species and number of individuals attracted to ship tracks in ice.

6. Subject to safety considerations and the potential for conditions as determined by the crew of transiting vessels, to result in route deviations, the Proponent shall require project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors. The proponent shall summarize all incidences of deviations from the nominal shipping route as presented in the FEIS to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.
7. The Proponent shall ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait, are identified and implemented prior to commencement of shipping operations. These measures could include, but are not limited to:
    a. changes in the frequency and timing (including periodic suspensions) of shipping during winter months, i.e., when interactions with marine mammals are likely to be the most problematic;
    b. reduced shipping speeds where ship-marine mammal interactions are most likely;
    c. identification of alternate shipping routes through Hudson Strait for use when conflicts between the proposed routes and marine mammals could arise. Repeated winter aerial survey results showing marine mammal distribution and densities in Hudson Strait would greatly assist in this task.

Shipboard Observers

8. The Proponent shall ensure that shipboard observers are employed through all seasons and provided with the means to effectively carry out assigned duties. The role of shipboard observers in shipping operations should be taken into consideration during the design of ore carriers, with climate controlled stations and shipboard lighting incorporated to permit visual sightings by shipboard observers during all seasons and conditions.
9. The Proponent shall revise the proposed “surveillance monitoring” to improve the likelihood of detecting strong marine mammal responses occurring too far ahead of the ship to be detectable by observers aboard the ore carriers. A baseline study early in the shipping operations could employ additional surveillance to detect potential changes in distribution patterns and behaviour. At an ambitious scope, this might be achieved using unmanned aircraft flown well ahead of ships, or over haul-out sites in the case of walruses.
10. The Proponent shall ensure that data produced by the surveillance monitoring program is analysed rigorously by experienced analysts (in addition to being discussed as proposed in the FEIS) to maximize their effectiveness in providing baseline information, and for detecting potential effects of the project on marine mammals in the Regional Study Area. It is expected that data from the long-term monitoring program be treated with the same rigor.

Ship noise

11. The Proponent shall conduct a monitoring program to confirm the predictions in the FEIS with respect to disturbance effects from ships noise on the distribution and occurrence of marine mammals. The survey shall be designed to address effects during three seasons of the year, and include locations in Hudson Strait and Foxe Basin. The survey shall continue over a sufficiently

lengthy period to determine the extent to which acclimation occurs for narwhal, beluga, bowhead and walrus.

12. The Proponent shall develop a monitoring protocol that, but is not limited to, acoustical monitoring, to facilitate assessment of the potential short term, long term, and cumulative effects of vessel noise on marine mammals and marine mammal populations. The Proponent is expected to work with the Marine Environment Working Group to determine appropriate early warning indicator(s) that to ensure rapid identification of negative impacts.
13. The Proponent shall develop clear thresholds for determining if negative impacts as a result of vessel noise are occurring. Mitigation and adaptive management practices shall be developed to restrict negative impacts as a result of vessel noise. This shall include, but not be limited to:
    a. Identifications of zones where cumulative noise could be mitigated due to biophysical features (e.g., water depth, distance from migration routes, distance from overwintering areas etc.);
    b. Vessel transit planning, for all seasons, to determine the degree to which cumulative sound impacts can be mitigated through the seasonal use of different zones.
14. Prior to commercial shipping of iron ore, the Proponent, in conjunction with the Marine Environment Working Group, shall develop a monitoring protocol that includes, but is not limited to, acoustical monitoring that provides an assessment of the negative effects (short and long term cumulative) of vessel noise on marine mammals. Monitoring protocols will need to carefully consider the early warning indicator(s) that will be best examined to ensure rapid identification of negative impacts. Thresholds shall be developed to determine if negative impacts as a result of vessel noise are occurring. Mitigation and adaptive management practices shall be developed to restrict negative impacts as a result of vessel noise. This shall include, but not be limited to:
    a. Identification of zones where noise could be mitigated due to biophysical features (e.g., water depth, distance from migration routes, distance from overwintering areas etc.);
    b. Vessel transit planning, for all seasons.
    c. A monitoring and mitigation plan is to be developed, and approved by Fisheries and Oceans Canada prior to the commencement of blasting in marine areas.

Arctic Char

15. The Proponent shall conduct monitoring of marine fish and fish habitat, which includes but is not limited to, monitoring for Arctic Char stock size and health condition in Steensby Inlet, as recommended by the Marine Environment Working Group.
16. In the event of the development of a commercial fishery in the Steensby Inlet area, the Proponent, in conjunction with the Marine Environment Working Group, shall update its monitoring program for marine fish and fish habitat to ensure that the ability to identify Arctic Char stock(s) potentially affected by Project activities and monitor for changes in stock size and structure of affected stocks and fish health (condition, taste) is maintained.
17. The Proponent is encouraged to continue to explore off-setting options in both the freshwater and marine environment to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).

Blasting

18. Prior to construction, the Proponent shall develop additional mitigation measures to minimize the effects of blasting on marine fish and fish habitat, marine water quality and wildlife that includes, but is not limited to compliance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by Fisheries and Oceans Canada for use in the North.
19. The Proponent shall ensure that that blasting in, and near, marine water shall only occur during periods of open water. Blasting in, and near, fresh water shall to the greatest degree possible, only occur in open water. If blasting is required during ice-covered periods, it must meet requirements established by Fisheries and Oceans Canada.
20. The Proponent shall incorporate into the appropriate mitigation plan prior to construction, thresholds for the use of specific mitigation measures meant to prevent or limit marine wildlife disturbance, such as bubble curtains for blasting, and nitrate removal.

Ringed Seals

21. The Proponent shall, in conjunction with the Marine Environment Working Group, monitor ringed seal birth lair abundance and distribution for at least two years prior to the start of icebreaking to develop a baseline, with continued monitoring over the life of the project as necessary to test the accuracy of the impact predictions and determine if mitigation is needed. Monitoring shall also include a control site outside of the Project's zone of influence.

Marine Mammal Interactions

22. The Proponent shall ensure that, subject to vessel and human safety considerations, all project shipping adhere to the following mitigation procedures in while the vicinity of marine mammals:
    a. Wildlife will be given right of way;
    b. Ships will when possible, maintain a straight course and constant speed, avoiding erratic behaviour; and
    c. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife have moved away from the immediate area.
23. The Proponent shall immediately report any accidental contact by project vessels with marine mammals or seabird colonies to Fisheries and Oceans Canada and Environment Canada respectively, by notifying the appropriate regional office of the:
    a. Date, time and location of the incident;
    b. Species of marine mammal or seabird involved;
    c. Circumstances of the incident;
    d. Weather and sea conditions at the time;
    e. Observed state of the marine mammal or sea bird colony after the incident; and,
    f. Direction of travel of the marine mammal after the incident, to the extent that it can be determined.
24. The Proponent shall summarize and report annually to the NIRB regarding accidental contact by project vessels with marine mammals or seabird colonies through the applicable monitoring report.

25. The Proponent shall provide sufficient marine mammal observer coverage on project vessels to ensure that collisions with marine mammals and seabird colonies are observed and reported through the life of the Project. The marine wildlife observer protocol shall include, but not be limited to, protocols for marine mammals, seabirds, and environmental conditions and immediate reporting of significant observations to the ship masters of other vessels along the shipping route, as part of the adaptive management program to address any items that require immediate action.

Harvesting

26. The Proponent shall prohibit project employees from recreational boating, fishing, and harvesting of marine wildlife in project areas, including Steensby Inlet and Milne Inlet. The Proponent is not directed to interfere with harvesting by the public in or near project areas, however, enforcement of a general prohibition on harvesting in project areas by project employees during periods of active employment (i.e. while on site and between workshifts) is required.

Public Engagement

27. Prior to use of acoustic deterrent devices, the Proponent shall carry out consultations with communities along the shipping route to assess the acceptability of these devices. Feedback received from community consultations shall be incorporated into the appropriate mitigation plan.
28. The Proponent shall design monitoring programs to ensure that local users of the marine area in communities along the shipping route have opportunity to be engaged throughout the life of the Project in assisting with monitoring and evaluating potential project-induced impacts and changes in marine mammal distributions.
29. The Proponent shall ensure that communities and groups in Nunavik are kept informed of project shipping activities and are provided with opportunity to participate in the continued development and refinement of shipping related monitoring and mitigation plans.
    a. The Proponent shall consult with local communities as fish habitat off-setting options are being considered and demonstrate its incorporation of input received into the design of the Fish Habitat Off-Setting Plan required to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).

5. SOCIO-ECONOMIC EFFECTS

5.1 Population Demographics

5.1.1 Views of the Proponent

Baffinland concluded in its FEIS that the Project would be likely to have multiple residual effects on the Population Demographics Valued Socio-Economic Component (VSEC) for some of the communities in the Local Study Area, but that the dynamic nature of human and community interactions make it difficult to predict the overall direction and magnitude of such changes on communities.[146] The FEIS defined the socio-economic Local Study Area as comprised of the five North Baffin point of hire communities (Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet), and Iqaluit. Baffinland considered demographic stability as the key indicator in its assessment of the population demographics VSEC.

As a result of the possibility of additional jobs that may become available as a result if other project developments in the region, Baffinland suggested that more southerners and Inuit may migrate into communities within the Local Study Area to take advantage of employment opportunities and that some of these individuals may decide to stay on more permanently, though noted that it would be likely that migrants would remain in the larger centre of Iqaluit.

Baffinland also noted within its FEIS that residual effects from in-migration and out-migration were expected to occur with the development of the proposed Project. The assessment did not consider these residual effects of this migration to be sufficient enough to cause adverse effects on the demographic stability of the affected communities and therefore Baffinland concluded that the residual effects were not significant.

During the Final Hearing, Baffinland indicated that the fly-in, fly-out nature of employment of the Project was considered in its assessment of potential for migration.[147]

In its FEIS, Baffinland indicated that Inuit employees of the Project who may have gained skills from training programs and through employment at Mary River may decide to leave the region in order to work or to take advantage of opportunities such as better services, schools and recreation in other locations. This ability to choose was considered to be a positive effect. Baffinland indicated in its FEIS that negative effects could be experienced if a number of skilled persons were to leave the North Baffin region or any one community, but that the number of Inuit to leave that would adversely affect the function of a community or the region remains uncertain.

Baffinland further noted in its FEIS that during initial project scoping, residents of communities had indicated that mine closure and resulting job losses were of concern, as well as potential layoffs that may occur during operations of the mine in response to global market forces, and included a consideration of these concerns as a subject of note in its FEIS.

Baffinland's FEIS predicted an employment "bust" that would be felt as initial construction jobs are lost at the start of operations, however it did not predict that this bust would be expected to affect employees recruited by the Local Study Area because the level of employment demanded during operations would be expected to exceed local supply capacity, even at entry levels.

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[146] FEIS, Volume 4, Section 2.5, February 2012.

[147] D. Brubacher, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 402, lines 14-24

5.1.2 Views and Concerns of Interested Parties

During the Final Hearing, the Government of Nunavut indicated that Baffinland failed to fully address its concerns with regard to the impacts of project related economic or labour migration, and that while it agreed with Baffinland's assertion that migration of individuals and families is a complex issue, it did not share Baffinland's certitude with respect to predictions that such effects would have a negligible impact.[148] The Government of Nunavut further indicated that during its consultations with communities, migration was clearly highlighted as a key concern.[149] As part of its presentation to the NIRB during the Final Hearing and as was included in its final written submission to the Board, the GN recommended that Baffinland be required to undertake an annual survey of its employees to identify such things as change of address, housing status, and preferences and migration intentions, and that, in addition to monitoring employees from non-point-of-hire communities, Baffinland also be required to monitor employee drop-off destinations for off rotations in order to determine whether employees return to their home addresses at the completion of work terms.[150]

During the community roundtable session in Iqaluit, the City's Mayor indicated that:

> *The position of the City of Iqaluit is that as a result of the fly-in and fly-out policy and the extra income, there will be many reasons why an individual family from the five north Baffin communities will move to Iqaluit…we have more housing options…we have more services…we have more employment options for the spouses of mine employees; daycare; recreation infrastructure; activities such as arenas, swimming pool, curling rink, youth centres, programs, restaurants, bars, social clubs; and in addition, lower cost of living, especially cheaper food, compared to some of those smaller communities.*[151]

The Mayor further suggested that Baffinland and major stakeholders such as the government and Inuit organizations work with the City of Iqaluit to project what the potential number of migrants might be and to plan accordingly.[152]

The Qikiqtani Inuit Association also provided a number of recommendations within its final written submission to the Board which pertain to socio-economic monitoring, planning and programming.[153]

5.1.3 Views of the Board

Where the Government of Nunavut and the City of Iqaluit expressed issue with Baffinland's conclusions, predictions, and proposed strategies for monitoring and mitigation of potential effects to demographic stability, the Board feels that the Proponent has underestimated the potential impacts of project-related

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[148] E. Prosh, GN, NIRB Final Hearing File No.: 08MN053 Transcipt, July 18, 2012, p. 628-629, lines 14-26 and 1-4.
[149] E. Prosh, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 629, lines 5-9.
[150] E. Prosh, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 630, lines 1-11.
[151] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1260-1261, lines 25-26 and 1-19.
[152] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1262, lines 11-14.
[153] Qikiqtani Inuit Association, Final Written Submission, May 30, 2012.

migration (both in-migration to Iqaluit, and out-migration from smaller centres), and it has concerns regarding the potential indirect impacts of migration to North Baffin communities, individuals, and service providers.

The Board agrees with the Government of Nunavut and the City of Iqaluit, which indicated during the Hearing that migration poses real implications for services and for infrastructure as provided by each of these institutions both in Iqaluit and in smaller centres. The Board has concerns with respect to the potential for in-migration to the Territory's capital and to other point-of-hire communities and the potential indirect effects which may result from Project related movement of people, including overcrowding, impacts to housing availability, social and domestic issues including increased alcohol and drug related crime, abuse, and incarceration, as well as the potential for increased pressures on services such as education, day care, social services and health care. The potential impact of out-migration from smaller communities is also of concern to the Board as such may lead to skilled people leaving their home communities for greater opportunities in Iqaluit or in the south.

The Board acknowledges that the Mary River project has the potential to significantly alter the socio-economic environment within Nunavut, and that certain changes would be felt at not only the individual level, but at the community and territorial levels as well. In- and out- migration are impacts that must be considered and monitored throughout the life of the Project. The information gleaned from this type of monitoring could assist government and other service providers in determining the levels of service required to support changing community needs and to acquire the funding needed to ensure these service levels are met. Information collected may also be used in conjunction with monitoring data obtained by the Proponent from newly hired and out-going employees in order to assess the potential effect the Project has on migration.

The Board found the Proponent's analysis of the potential sourcing of Inuit versus non-Inuit labour required for the Project from communities in the North Baffin region, from other regions of Nunavut, other provinces or territories in Canada, or from foreign countries to be lacking. In particular, the Board found the Proponent's inability to provide accurate predictions of available labour or even the likely sources of labour for the Project suprising. In the Board's view reporting on its procurement of labour is necessary to gauge the actual gap between the available labour pool in Nunavut and what is required to develop the Project and the Board considers that this information will be required before project development begins.

Further, the Board does not feel that Baffinland has adequately addressed the potential for interactions between local residents and non-residents that may result from any potential in-migration of employees, nor the potential for demographic changes to have impacts upon the cultural integrity of the North Baffin region and its individual communities.

In addition to this, the Board does not feel that Baffinland has adequately assessed or addressed the potential effects of unemployment that may result from the temporary suspension of operations or mine closure as was required by the NIRB's EIS Guidelines for the Project.

The Board recognizes the recommendations provided by the Qikiqtani Inuit Association regarding socio-economic monitoring[154] and has, where appropriate, provided recommendations to address these matters.

5.1.4 Conclusions and Recommendations of the Board

The Board recognizes the value of the work that may be undertaken by Baffinland and other parties in a working group format, and so recommends:

1. The Proponent is strongly encouraged to engage in the work of the Qikiqtaaluk Socio-Economic Monitoring Committee along with other agencies and affected communities, and it should endeavour to identify areas of mutual interest and priorities for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the North Baffin region as a whole.
2. The Proponent should consider establishing and coordinating with socio-economic working groups to meet Project specific monitoring requirements throughout the life of the Project.

The Board acknowledges that the Proponent may not be in a position to feasibly monitor certain socio-economic indicators in their entirety, and so has provided recommendations for the consideration of the Qikiqtaaluk Socio-Economic Monitoring Committee and its membership which would assist in the monitoring of demographic changes affecting the North Baffin communities and the territory as a whole:

3. The Qikiqtaaluk Socio-Economic Monitoring Committee and its membership are encouraged to engage in the monitoring of demographic changes including the movement of people into and out of the North Baffin communities and the territory as a whole. This information may be used in conjunction with monitoring data obtained by the Proponent from recent hires and/or out-going employees in order to assess the potential effect the Project has on migration.
4. The Proponent is encouraged to partner with other agencies such as Hamlet organizations in the North Baffin Region, the Municipal Training Organization, and the Government of Nunavut in order to adapt pre-existing, or to develop new programs which encourage Inuit to continue living in their home communities while seeking ongoing and progressive training and development. Programs may include driver training programs offered within Hamlets, providing upgraded equipment to communities for use in municipal works, providing incentives for small businesses to remain operating out of their community of origin, or supplementing existing recreational facilities and programming in North Baffin communities.

The Board also recommends that the Proponent undertake project-specific monitoring of employee information in order to contribute valuable data into the initiatives of the Qikiqtaaluk Socio-Economic Monitoring Committee and those undertaken by other agencies as such may inform the NIRB and other agencies of demographic changes occuring within communities, the North Baffin region, and Nunavut as a whole:

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[154] Qikiqtani Inuit Association, Final Written Submission, May 30, 2012.

5. The Proponent is encouraged to work with the Qikiqtaaluk Socio-Economic Monitoring Committee to design and implement a voluntary survey to be offered to its employees on an annual basis in order to identify changes of address, housing status (i.e. public/social, privately owned/rented, government, etc.), and migration intentions, while respecting confidentiality of all persons involved. The survey should be designed in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation and other relevant stakeholders. Non-confidential results of the survey are to be reported to the Government of Nunavut and the NIRB.
6. The Proponent shall include with its annual reporting to the NIRB a summation of employee origin information as follows:
    a. The number of Inuit and non-Inuit employees hired from each of the North Baffin communities, specifying the number from each;
    b. The number of Inuit and non-Inuit employees hired from each of the Kitikmeot and Kivalliq regions, specifying the number from each;
    c. The number of Inuit and non-Inuit employees hired from a southern location or other province/territory outside of Nunavut, specifying the locations and the number from each;
    d. The number of non-Canadian foreign employees hired, specifying the locations and number from each foreign point of hire.

5.2 Education and Training

5.2.1 Views of the Proponent

Baffinland's FEIS assessed the availability of labour within the Local Study Area as such would be needed to satisfy the development of the Project, and further identified gaps between available labour and Project labour requirements. The FEIS defined the socio-economic Local Study Area (LSA) as comprised of the five North Baffin point of hire communities (Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet), and Iqaluit.

In its FEIS, Baffinland indicated that it would work in partnership with Inuit organizations and government to implement training programs during the construction phase of the Project in order to prepare Inuit beneficiaries of the LSA for work at the Project, and it further identified a suite of initiatives designed to support capacity development of the Local Study Area labour force. The FEIS described the proposed training programs along with the initiatives presented, and gave consideration to language and cultural barriers which have the potential to affect both Inuit and non-Inuit Project employees.

Baffinland's FEIS also discussed a number of on- and off-site training plans designed for both Project employees and in some cases, for other members of the community as well. Baffinland indicated that it would make an effort to integrate education and training for the Project with existing programs, and to take advantage of relevant programs in other regions of Nunavut, as well as to coordinate on education

and training initatives with the Qikiqtani Inuit Association, the Government of Nunavut, various training institutions, communities of the North Baffin region, and the federal government.

During the Final Hearing Baffinland also noted that it plans to train more apprentices than it will require during the operations phase of the Project and that it would therefore release capacity back to the communities, in addition to providing a program to support students and further education.[155] Furthermore, Baffinland highlighted its training philosophy, citing its “Opportunities for a Lifetime” program which offers adult education refresher training, resume writing training, work-ready training, and job-specific training and which would be supported by the use of Inuktitut, the presence of Elders on-site and in the communities, an employee and family assistance program.[156]

Baffinland’s FEIS concluded that the Project would be expected to have a significant positive and long-term impact on levels of education, training and life skills within communities.

5.2.2 Views and Concerns of Interested Parties

In his intervenor submission to the Board, Zacharias Kunuk noted that, while commitments regarding labour force management are made throughout the Proponent’s FEIS, these “good faith” commitments alone are rarely sufficient, and a need for institutions to enforce accountability exists with respect to the Project.[157] The submission further recommended that Baffinland be required to submit monitoring reports and that it be required to make changes where such reporting indicates that compliance with established standards is proving to be difficult.

During the community roundtable session, a participant from Igloolik expressed that she thought that Steensby Inlet belonged to the Elders of the region because this area had been their traditional hunting grounds and at one point had served as an outpost camp for Inuit. She further indicated that the people of Igloolik consider the Steensby Inlet area to be their current hunting grounds, and expressed concern that if the Project were to proceed, residents may be denied good job opportunities because they may not meet education requirements. The participant also inquired about assistance available to residents of Igloolik to help them take advantage of opportunities, noting that it would be very sad if she were to perish and had nothing “else” to leave to her grandchildren.[158]

A community member in Igloolik asked Baffinland to comment on the possibility of training that might be available before the Project develops, in order that people be able to experience some relevant training in order to inform their decision, prior to going through a competition process, whether the job is something they might actually enjoy and want to pursue.[159]

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[155] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 23 (pm), 2012, p. 1493, lines 14-18.
[156] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 23 (pm), 2012, p. 1493-1494, lines 19-26 and 1-2.
[157] Dr. Zacharias Kunuk, Final Written Submission, June 8, 2012.
[158] M. Airut, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 24, 2012, p. 1787 (pm), lines 6-21.
[159] L. Idlout, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 25 (pm), 2012, p. 1946, lines 17-25.

Further, an Elder from Iqaluit noted that many people who want to work cannot secure jobs, and that they are told they cannot be hired because they do not have the necessary skills.[160]

The Qikiqtani Inuit Association also provided a number of recommendations within its final written submission to the Board which pertain to socio-economic monitoring, planning and programming, and specifically which relate to the training and employment of Inuit as Project monitors and the development of training programs.[161]

5.2.3 Views of the Board

As noted previously in this report, during the Hearing Baffinland was unable to provide the Board with estimates of the number or proportion of employees that may be hired from any one area or demographic, including Inuit from the North Baffin region, Inuit from other Nunavut regions, non-Inuit Nunavummiut, and southern Canadians, and was further unable to estimate what proportion of Project labour requirements may require the hiring of non-Canadian labour. The Board feels that these items, specifically the potential hiring of residents from Southern Canada and other countries may have the potential to further impact upon the Proponent's planned training initiatives as such may be implicated in its language and cross-cultural awareness programs. The Board does not feel that the Proponent has given adequate consideration to how it will source the labour (both skilled and unskilled) at levels it has estimated will be required for the Project's development, including the construction, operation, and closure phases. In a territory with a small population and a great need for education and training programs to assist that population in taking advantages of the opportunities presented by a Project such as Mary River, the Board feels that proper forecasting and planning is very important in ensuring a large proportion of benefits accrue to the Inuit, agencies, and government of Nunavut.

The Board does not feel that Baffinland gave adequate consideration to the transferability of employment skills as required by the EIS Guidelines for the Project. As an example, the Board heard during the Final Hearing that potential Baffinland mine site truck operators would not require a drivers' licence in order to operate equipment but rather, that they would be trained to operate various types of on-site equipment and would be granted a licence that would be valid on-site only.[162]

During the Hearing, the Board indicated that certificates which may be used at other places of employment could impart benefits to potential trainees:

> *…Our young people seem to be more successful when they are put in a training program that's comprehensive and that has end results attached to it, and the apprenticeship program seems to work well for them because they have a long-term training program --*

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[160] E. Sageaktook, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1129, lines 17-22.
[161] Qikiqtani Inuit Association, Final Written Submission, May 30, 2012.
[162] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 25, 2012, p. 1829-1830, lines 11-26 and 1-15.

component to it, and at the end of the day, when they are finished training, they get their trades paper certificates that they can use anywhere in Canada.[163]

The Board notes that Baffinland's FEIS did not provide a discussion or listing as to what skills learned and/or licences or certificates obtained on-site would be transferable to other places of employment should the employee choose to leave their employment with the Project. While encouraged by the Proponent's plans to promote education and training for Inuit of the North Baffin region, the Board is concerned that site-specific training may not be transferable to places of employment other than Mary River, and that this could limit the future employability of persons taking positions with the Project. Details were lacking with regard to other types of training that would pertain specifically to the Mary River employment experience, as was a discussion about skills which could be transferable to other jobs or worksites.

The Board also has concerns regarding the potential for school dropout rates to increase as a result of students leaving formal education in order to pursue employment with the Mary River Project, either directly through employment with Baffinland, or indirectly, as positions may become available with other firms providing goods or services to the Project. While the Board understands that Baffinland plans to employ work/study programs at the project site, it has concerns regarding the effectiveness of such programs given the 12 hour work days to be scheduled for site employees, given the limited tim that employees might have available outside of working hours to attend to study programs.

The Board recognizes the recommendations as provided by the Qikiqtani Inuit Association regarding socio-economic considerations and has, where appropriate, provided socio-economic monitoring and programming recommendations to address and support these matters.

5.2.4 Conclusions and Recommendations of the Board

Where the Board heard concerns regarding training opportunities and had its own questions regarding the transferability of skills and certificates that may be obtained as a result of employment with the Project, the Board recommends the following:

1. The Proponent is encouraged to consider additional options for work/study programs available to Project employees.
2. The Proponent is encouraged to work with training organizations and/or government departments offering mine-related or other training in order to provide additional opportunities for employees to gain meaningful and transferable skills and certifications, especially where such training of employees offered by the Proponent remains valid only at the Mary River Project sites.
3. Prior to construction, the Proponent shall develop an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during employment at Mary River and that such a listing indicate which of these certifications and

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[163] Board member A. Maghagak comment, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 460, lines 7-15.

licences would be transferable to a similar job site within Nunavut. This listing should be updated on an annual basis, and is to be provided to the NIRB upon completion and as may be revised.

4. The Proponent is encouraged to work with the Qikiqtani Inuit Association to ensure the timely development of Inuit training and work-ready programs.

The Board has concerns regarding the uncertainty regarding the origin of employees, especially with respect to how hires from southern Canada or out of country may implicate the Proponent's on-site programming. Baffinland must recognize that significant effort must be placed into education and training of local Inuit, North Baffin Inuit, Nunavut beneficiaries and non-Inuit Nunavummiut in order to ensure benefits accrue as much as possible, to Nunavut and to the residents of Nunavut. The Board is therefore recommending that:

5. Prior to commencing construction, the Proponent shall undertake and provide the results of a detailed labour market analysis which provides quantitative predictions of the number of employees that may reasonably need to be sourced from southern Canada and from foreign markets, identifying where applicable, the country of origin for the foreign labour. The results of this analysis are to be provided to the NIRB upon completion.

Noting that the potential exists for employees to abandon previous employment within their community of origin, or to abandon formal education in pursuit of employment with the Project, the Board is recommending that the Proponent consider the following:

6. The Proponent is encouraged to survey Nunavummiut employees as they are hired and specifically note the level of education obtained and whether the incoming employee resigned from a previous job placement or educational institution in order to take up employment with the Project.

As the Proponent committed to have Inuit serve as site monitors throughout the Project life, and also to serve in Qikiqtani Inuit Association and Baffinland positions such as the Community Liaison Officer, the Board recommends that:

7. The Proponent is encouraged to work with the Qikiqtani Inuit Association prior to construction in order to prioritize the provision of training of Inuit to serve as employees in monitoring or other administrative capacities.

5.3 Livelihood and Employment

5.3.1 Views of the Proponent

Baffinland's FEIS provided an assessment of the number of jobs created directly as a result of the development of the Project, and further discussed employment through indirect jobs as a subject of note, providing estimated numbers for both direct and indirect employment opportunities generated by the Project.

Baffinland concluded in its FEIS that it had assessed the beneficial residual effects of the Project on wage employment of North Baffin Local Study Area residents to be significant and that it predicted positive effects on the employment of Iqaluit residents. It was further noted that the Project was not expected to have significant negative effects on livelihoods and employment and that with successful implementation of proposed mitigation measures, there would be a significant positive effect on available jobs and career advancement for Inuit in North Baffin communities and Iqaluit.

Requirements for employment were presented within the FEIS, including those pertaining to education, language and literacy proficiencies, previous experience or specialized training, residency requirements, criminal records, and health and medical information. Opportunities for women and youth were spoken to as matters under consideration in the development of training programs and on-site orientation and policy.

In addition to discussing commuting arrangements within its FEIS, Baffinland also noted during the Final Hearing that it intended to fly Inuit employees from non-point of hire communities to Iqaluit en route to the site, and that employees hired from of the direct points of hire would also be flown to and from site for work rotations.[164]

Baffinland's FEIS also included a discussion of indicators for the human health Valued Socio-Economic Component which included the well-being of children, substance abuse and community social stability and which also included household income, money management, and food security as subjects of note. The FEIS indicated that orientation and training sessions related to money management would be included as a component of pre-employment training.

Baffinland noted in its FEIS that decisions made regarding how income is spent by individuals will influence what the overall effect improved income as a result of employment will have on individual households. The potential for poor decisions was recognized, however the FEIS indicated the expectation that the Project would improve money management amongst some households simply by increasing income, increasing the choices that must be made, and raising the stakes associated with making poor money choices. Furthermore, with an increased household income, Baffinland predicted that Project employees will see improved affordability of land-based harvested foods as well as retail-purchased foods, considering the affordability of retail food relative to household income and the ability to carry out land-based harvesting activity.

Baffinland's FEIS predicted that after mine closure, long-time employees and those dependent on the income from mine work would likely experience some disruption, however, it further indicated that certain skills would be transferable to other jobs, and that Project employees would have had training and support in career planning and financial planning.

Baffinland indicated that many indirect jobs would be created in Nunavut due to the economic stimulation that the Project may bring to the territory and that such jobs would benefit Inuit in the North Baffin and Iqaluit to the extent that they have the skills and ability to fill them.

[164] D. Brubacher, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 404, lines 12-16.

The Proponent's FEIS addressed livelihood options and traditional harvesting as a subject of note and focused upon the potential effects the Project could have to the traditional harvesting lifestyle. Baffinland indicated that the Project would be expected to affect the harvesting lifestyle in that income may improve the affordability of harvesting activities and that individuals employed at the Project may find time to engage in a moderate intensity of harvest activity during their off-rotation. The Proponent noted that the two weeks on/off work rotation may provide sufficient time for an employee to re-connect with family and community and to have time to pursue substantial harvest activity.

5.3.2 Views and Concerns of Interested Parties

The Government of Nunavut noted during the Final Hearing that while resource development may provide jobs and opportunities for the people of Nunavut, this development must not come at the expense of the health and well-being of its people.[165]

AANDC recommends that the Proponent provide further details to the Qikiqtaaluk Socio-Economic Monitoring Committee regarding its proposed orientation and work readiness program to allow a full analysis of sustainable skills development. Further, it was recommended that the Proponent commit to the development of a strategy to monitor the use and effectiveness of the orientation and work readiness program in consultation with partners to the Q-SEMC. This could include monitoring participants completing the program with post program-completion employment status. This monitoring would be in combination with more general monitoring on sustainable skills, education and training. AANDC further suggested in its final written submission to the Board that post-closure monitoring of socio-economic effects continue, at a minimum, throughout both the three-year closure and five-year post-closure periods.[166]

During the Final Hearing, members of the public expressed concern that people currently employed in positions may choose to abandon jobs within the community (particularly jobs with local Hamlets that would be involved in the provision of municipal services) to pursue Project employment, either directly through employment with Baffinland, or indirectly as positions may become available with other firms providing goods or services to the Project.[167] Further points were raised by members of the community roundtable session, specifically noting that while the Project presents an opportunity for many jobs to be created, that a number of training to occur at the mine site. It was recommended that Baffinland enter into partnerships that would allow for some training of operators or skilled labourers to occur within the communities, on a regional scale.[168]

5.3.3 Views of the Board

As was mentioned previously in the report, the Board is concerned that the Propoennt was unable to provide estimates of its labour sourcing. The Board feels that further detail are required to better utilise

[165] N. Strijak, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 634, lines 1-4.
[166] Aboriginal Affairs and Northern Development Canada, Final Written Submission, May 30, 2012.
[167] L. Idlout, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 25 (pm), 2012, p. 1949, lines 20-26.
[168] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1266, lines 19-26.

future information for comparisons against predicted effects and to determine whether adaptive management may be required. While the Proponent was able to provide estimated numbers of direct and indirect jobs it anticipates will be available during various Project phases, the Board does not feel that the Proponent has given adequate consideration to how it will source the labour (both skilled and unskilled) at levels it has estimated will be required for the Project's development, operation, and closure.

The Board acknowledges and agrees with concerns raised during the Final Hearing regarding the potential for people to abandon jobs within their home community in order to pursue employment with the Mary River Project, either directly through employment with Baffinland, or indirectly, as positions may become available with other firms providing goods or services to the Project.

Furthermore, the Board has concerns regarding Baffinland's preparedness with respect to effectively fostering cross-cultural understanding among employees at the mine site, as well as to foster an understanding among and between employees from different parts of the North Baffin region or other regions of Nunavut, and potentially from other areas of Canada and/or other countries.

In addition, the Board has concerns related to the barriers to employment that are faced by women in particular, and how childcare and other related subsidies may help to lessen these barriers for women pursuing workforce opportunities.

Finally, the Board heard from members of the public during the Final Hearing that increased income may have impacts upon employees' or their family's access to public social housing; noting specifically, that as incomes increase, so too does the amount of rent payable increase. This may create a disincentive for people to maintain employment, as the costs of maintaining housing may begin to reach parity with the benefits gained from Project employment.[169] The Board is encouraged by the Proponent's plans to provide employee and family assistance support related to financial matters, and to have this provided in Inuktitut, by Inuit counsellors.[170]

The Board wishes to recognize the Proponent's commitment to ensuring language is not a barrier to employment with the Project, namely that unilingual Inuktitut speaking individuals would not penalized during the hiring process based upon this factor.

5.3.4 Conclusions and Recommendations of the Board

The Board has recommended in the preceding Section 5.2 that the Proponent survey its employees upon hiring in order to determine whether the employee left gainful employment with a Hamlet or other local business or organization. This information is meant to assist the Board in assessing Project-related impacts to the retention rates for municipal employment and local businesses.

The Board expressed concern in Section 5.2 regarding the Proponent's inability to estimate the number of employees it plans to hire from southern Canada and from outside of Canada. This uncertainty limits

[169] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1261, lines 5-10.
[170] A. Pearce, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 23 (pm), 2012, p. 1428, lines 4-8.

the Board with respect to any analysis of, and recommendations it may make with respect to the competition for labour between the Project and existing businesses, institutions, traditional activities and the ability of Nunavut, or Canada, to provide this labour for the Project. The Board has requested that prior to construction, the Proponent undertake a more detailed labour market analysis in order to provide reliable predictions of the number of employees that may reasonably need to be sourced from southern Canada and from out of country.

The Board recommends the following measures that it believes will assist in promoting cohesion between employees on site, and between employees and their families:

1. The Proponent is encouraged to consider the potential for direct and indirect effects that may result from Project employees' on-site use of various Inuktitut dialects as well as other spoken languages, specifically paying attention to the potential alienation of some employees that may occur as a result of language or other cultural barriers.
2. The Proponent is encouraged to consider the use of both existing and innovative technologies (e.g. community radio station call-in shows, cell phones, video-conferencing, Skype, etc.) as a way to ensure Project employees are able to keep in contact with family and friends and to ward off the potential for feelings of homesickness and distance to impact on employee retention and family stability.

The Board recognizes the Proponent's plans to offer certain employment opportunities to unilingual Inuktitut-speaking individuals; however the Board does have concerns that the prerequisites for employment may limit the opportunities available to certain segments of the population and therefore makes the following recommendations:

3. The Proponent is encouraged to make requirements for employment clear in its work-readiness and other public information programs and documentation, including but not limited to: education levels, criminal records checks, policies relating to drug and alcohol use and testing, language abilities.
4. The Proponent is encouraged to work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring Committee to monitor the barriers to employment for women, specifically with respect to childcare availability and costs.
5. The Government of Nunavut and the Qikiqtani Inuit Association are strongly encouraged to investigate the possibility for Project revenue streams to support initaitves or programs which offset or subsidize childcare for Project employees.
6. The Proponent is encouraged to work with the Government of Nunavut and the Nunavut Housing Corporation to investigate options and incentives which might enable and provide incentive for employees living in social housing to maintain employment as well as to negotiate for and obtain manageable rental rates.

5.4 Economic Development and Self-Reliance, and Contracting and Business Opportunities

5.4.1 Views of the Proponent

In its FEIS, Baffinland presented an assessment of the economic development and self-reliance Valued Socio-Economic Component, including predicted and expected interactions between the Project and the economy of the Local Study Area and the Regional Study Area.

Baffinland indicated in its FEIS that in the absence of mitigation, it would be likely that the larger and more sophisticated businesses of the Inuit birthright corporations may be expected to have capacity to gain some service contracts with the Project however, it contributes to a fund managed by the Qikiqtani Inuit Association which is meant to support managerial and financial expertise to Inuit entrepreneurs. It was suggested in Baffinland's FEIS that this would enhance the skill set of local businesses and that the Project would create opportunities for local businesses to expand.

Baffinland's FEIS also discussed potential benefits to the local and regional economy, and identified some risks to local businesses, including the risk that those businesses which develop solely for the Project and which depend upon the Project's operation will cease when the Project slows or closes if they do not expand clientele beyond the Project.

Baffinland has acknowledged that there could be some loss to local organizations and businesses if key people go to work at the mine or leave the community, but that this loss is expected to be small. Further, it plans to implement initiatives to help develop the capacity and skill levels of businesses and the labour force.

Over the long term, Baffinland has suggested that the road, Railway, and port infrastructure could provide opportunities to access further mineral deposits in the North Baffin region and could improve access for Inuit harvesting and tourism. The two ports could provide opportunities for additional commercial uses and the bathymetry information collected by the Project could provide important information for shipping lanes through Foxe Basin.

In its FEIS, Baffinland noted that traditional harvesting has a fundamental role in livelihoods and food security, but that where Inuit have raised concerns about the high cost of harvesting activities and inadequate transfer of land skills and knowledge to younger generations, it noted that the infusion of jobs and income that the Project may bring to the region could improve access to those harvesting activities which would otherwise, continue to decline. Further, the Proponent has indicated that the Project-induced changes would allow Inuit who wish to work to have that opportunity. Baffinland suggested that the Project is not expected to affect the daily routine of Inuit or their local cultural pursuits given its distance from the various communities of the North Baffin region.

In its FEIS Baffinland indicated its plan to provide meals and accommodations to hunters and travellers visiting project sites or travelling through the Project area, and noted that it would provide fuel to hunters whose travel was diverted around the Steensby Inlet Port and associated shipping route.[171]

[171] FEIS, Volume 10, Appendix 10F-3.

The Proponent has indicated that land use activities associated with the Project would be likely to disrupt the “wilderness experience” of tourists who may be in project areas, especially near Milne Inlet and shipping along the transportation route, but that these disruptions would be low in frequency.

Baffinland has indicated that through its contributions to human skills, to household wealth and to economic growth, the Project will support achievement of overall economic development goals, including progress toward the improved self-reliance of individuals, communities, and the territory as a whole. It further indicated that the overall wealth in North Baffin communities and Iqaluit would be expected to increase through employment wages, local procurement and business contracts, but that the realization of this benefit depends upon the ability of communities to take advantage of opportunities presented.

With specific regard to contracting and business opportunities, Baffinland noted in Volume 4 of its FEIS that the Project would be expected to create a new market for business-to-business contracts, representing a positive effect in the small economies of the North Baffin Local Study Area. In addition, Baffinland concluded that the Project would likely have a positive and substantial effect on market opportunities for businesses to provide goods and services for the Project. Baffinland noted that the ability of businesses to capture these opportunities was less certain in its analysis, given the difficulties faced by entrepreneurs in paperwork, gaining access to affordable business support services, and lower capacity in the Local Study AreaLocal Study Area in general. Baffinland provided mitigative measures to assist local businesses in capturing the opportunities presented by the Project, but uncertainty arising from many factors affecting entrepreneurial capacity that are beyond Baffinland’s influence prevented it from providing confident predictions regarding the possible outcome of the implementation of such measures.

Baffinland’s FEIS also suggested that the Project would be likely to serve as a major economic driver in Nunavut, and that it could promote the development of new local and regional businesses related to the supply of industrial goods and services.

In conclusion, Baffinland asserted that overall the Project will have a positive impact on the economic development and self-reliance of the North Baffin and of Nunavut as a whole.

5.4.2 Views and Concerns of Interested Parties

Aboriginal Affairs and Northern Development Canada also indicated in its submission to the Board that other mines in Nunavut have not achieved their proposed mine life due to economic factors.[172] Since this failure of other projects to achieve a proposed mine life has had socio-economic impacts, AANDC recommended that the Proponent undertake an analysis of the risk of temporary closure and that Baffinland give consideration to how communities in the Local Study AreaLocal Study Area may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects.

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[172] Aboriginal Affairs and Northern Development Canada, Final Written Submission, May 30, 2012.

Parks Canada's final written submission to the Board identified visitor experience as a key area of focus due to the potential negative effects of increased air and shipping traffic as a result of mining activities on visitors, researchers and beneficiary users of Sirmilik National Park.[173] Parks Canada noted that in its FEIS, Baffinland committed to reducing potential impacts to these users by: (1) maintaining, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons; (2) ensure certification of noise compliance, if applicable, is current; (3) provide Parks Canada with regular flight and shipping schedules that can be used to brief visitors; and (4) provide due consideration to wilderness experience during open water, especially during August which is the season of high use by sea kayakers.[174]

With respect to contracting opportunities, the Qikiqtani Inuit Association indicated during the Final Hearing that provisions within the Inuit Impact and Benefit Agreement currently under negotiation would require that larger contracts be broken down into smaller subcontracts so that smaller Inuit firms would be able to take advantage of opportunities.[175]

5.4.3 Views of the Board

The Board agrees with Aboriginal Affairs and Northern Development Canada's suggestion that collaborative monitoring of Project harvesting interactions and food security include broader indicators of dietary habits in conjunction with other regional monitoring initiatives in place.

Though the FEIS discussed the potential for temporary mine closures to occur, the Board agrees with AANDC's recommendation and feels that the Proponent has not sufficiently assessed the potential impacts of temporary closure on the local and regional economy in question, nor has it provided sufficient mitigation measures to offset these potential adverse impacts that may occur from unexpected slowdowns or temporary closures.

The Board recognizes the Proponent's commitment to address the concerns raised by Parks Canada regarding impacts to park visitors.

Where also raised by members of the public, the Board has concerns regarding the ability of Inuit owned and smaller businesses to fully take advantage of the opportunities arising from the Project's development. While Inuit ownership of businesses may increase as companies look to take advantage of Project contracting or other business opportunities, the Board fears that Inuit ownership may not translate into greater Inuit employment with these Inuit-owned companies. Furthermore, small businesses may not have the capacity to bid on contracts made available by the Project. The Board feels that if Project contracts are of uniformly large size, it may force out smaller companies from providing competitive bids onto the jobs. The Board recognizes Baffinland's comment during the Final Hearing advising that the Inuit Impact and Benefit Agreement under negotiation for the Project contains provisions designed to provide contract opportunities that are within reach of smaller businesses.

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[173] Parks Canada Final Written Submisison, May 30, 2012.
[174] FEIS, Volume 1, Appendix 1B-5.
[175] O. Eegeesiak, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 25 (pm), 2012, p. 1921-1922, lines 26 and 1-5.

The Board also heard concerns from members of the public during the Final Hearing that potentially affected communities feel they do not have direct access to benefits and that therefore there is no guarantee that the most impacted communities will receive a corresponding share of the benefits from the Project.[176]

Finally, the Board recognizes the potential for the Project development to impact upon territorial services, however it considers it the responsibility of government to ensure that Project revenue streams are directed and utilized in a manner that most effectively offsets those Project-related impacts to infrastructure and/or services and that provides for benefits to Nunavut and Nunavummiut. The NIRB's concerns regarding this issue are also spoken to in later sections of this report.

5.4.4 Conclusions and Recommendations of the Board

The Board agrees with the recommendation put forth by Aboriginal Affairs and Northern Development Canada regarding food security and Project harvesting interactions, and therefore makes the following recommendation to the Proponent and the Qikiqtaaluk Socio-Economic Monitoring Committee:

1. The Propoent is encouraged to undertake collaborative monitoring in conjunction with the Qikiqtaaluk Socio-Economic Monitoring Committee's monitoring program which addresses Project harvesting interactions and food security and which includes broad indicators of dietary habits.

The Board has concerns regarding the potential for and impacts of, temporary mine closures on the economic well-being of the residents and businesses of the North Baffin. As such, the Board recommends the following:

2. Prior to the commencement of operations, the Proponent is required to undertake an analysis of the risk of temporary mine closure, giving consideration to how communities in the North Baffin region may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects. The results of this analysis are to be provided to the NIRB upon completion.

The Board recognizes Baffinland's commitment to addressing Parks Canada's concerns, and includes the following recommendations meant to reduce potential Project related impacts to the visitors, researchers and beneficiary users of Sirmilik National Park.

3. The Proponent will ensure the following:
    1. The Proponent will maintain, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons.
    2. The Proponent will ensure that certification of noise compliance is current, where compliance is applicable.

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[176] J. Nutarak, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2508-2509, lines 14-26 and 1-5.

3. The Proponent is encouraged to provide Parks Canada with regular flight and shipping schedules that can be used to brief Park visitors.
4. The Proponent is strongly encouraged to provide due consideration to wilderness experience during its operations in the open water season, especially during the month of August which is typically a time of high use by sea kayakers.

As was mentioned in Section 5.3, the Board has concerns with respect to how Project-related effects may contribute to the availability and accessability of housing in the North Baffin region, and as such, is recommending the following:

7. The Proponent is encouraged to investigate measures and programs designed to assist Project employees with homeownership or access to affordable housing options.

The Board has also expressed its concerns regarding the effects that local businesses may feel as a result of the Project's development, specifically as relating to smaller businesses bidding on contracts that become available. Although the NIRB recognizes that the Inuit Impact and Benefit Agreement is confidential in nature, monitoring efforts will be greatly assisted by maxium transparency and cooperation from the Proponent and the Qikiqtani Inuit Association with regards to data collected through implementation of this agreement moving forward. The NIRB provides the following recommendations:

8. The Proponent and the Qikiqtani Inuit Association are strongly encouraged to evaluate the effectiveness of any provisions within the Inuit Impact and Benefit Agreement which require that larger contracts be broken down into smaller contracts more accessible to local businesses. While respecting that some information may be deemed confidential or privileged, both parties are encouraged to report the results of their evaluations regularly and share data and information with the Qikiqtaaluk Socio-Economic Monitoring Committee and the NIRB to assist with ongoing monitoring efforts.

5.5 Human Health and Well-being

5.5.1 Views of the Proponent

Baffinland's FEIS provided a summary of baseline data that was considered relevant to the human health and well-being Valued Socio-Economic Component as well as an assessment of the potential impacts of the Project as could be determined by three key indicators with respect to human health including the well-being of children, substance abuse, and community social stability. It further provided a discussion of subjects of note which included:

- Household income and money management;
- Food security;
- Change in household composition;
- Safety and security; and,
- Human health.

The FEIS indicated that the residual impacts of the Project were anticipated to be positive and significant, with improved income being a major factor in this determination, given the improvement to the well-being of most children whose parents would be employed at the mine. Baffinland's FEIS also indicated that negative residual effects were expected to be present in relation to the well-being of some children owing to the absence of employees from the community, but that these effects were not expected to reach levels that would cause significant adverse effects on the VSEC. The FEIS further noted that the Project would be expected to have both positive and negative residual effects on substance abuse though neither the positive nor negative residual effects were found to be significant.

Baffinland's discussion of subjects of note included a high level discussion of potential impacts as generally relating to the proposed Project and provided measures that were proposed as part of its training and orientation programs where relevant to address the various subject of notes. Discussion of the human health subject of note addressed measures that would be taken to protect and safeguard employees from potential Project-related impacts such as fugitive dust, potable water and treated water effluent, noise and climate. Discussion within the FEIS also touched upon the potential of effects to the health of non-employees and noted that the likelihood of such interaction would be limited owing to the distance of the Project from local communities, and noted specifically that bioaccumulation resulting from the consumption of country food (blueberries and caribou) was unlikely to occur, based on a consideration of the areas expected to be affected by ore dust deposition, the location of blueberry harvesting areas, and the home range of caribou.

Mitigation measures and monitoring were proposed within Baffinland's FEIS, and were intended to minimize potential negative impacts and to promote any positive effects. Baffinland concluded in its FEIS that the health and well-being of mine employees and their families would be significantly improved and that while at the outset of employment there may be some negative effects resulting from substance abuse, as employees adjust to the demands of work at the mine and make use of education programs and counselling available to them, monitoring would likely demonstrate a positive shift in attitudes toward healthy lifestyle choices. The periodic absence of mine employees from the community was not expected to affect life in the community generally.

Baffinland's FEIS acknowledged that during an early period of transition, the potential exists for negative residual effects of substance abuse but that these effects would not be significant due to the short duration and moderate magnitude. Baffinland concluded that an overall positive residual effect on substance abuse was predicted tooccur, and that this effect was not found to be significant owing to the moderate magnitude and moderate level of uncertainty regarding its occurrence.

In order to address concerns about the potential increase in illegal substances coming through the Project site, Baffinland indicated in its FEIS that it would enforce a strict no drug and no alcohol policy and that it would make addiction counselling available to employees.

Baffinland concluded within its FEIS that the positive residual effect of the Project on the human health and well-being VSEC was assessed to be significant, and that while some negative residual effects may be present, these were not determined to be significant.

5.5.2 Views and Concerns of Interested Parties

During the Hearing proceedings, Nunavut Tunngavik Inc. emphasized the importance of Baffinland's ability and willingness to deal with the community issues pertaining to alcohol and drug abuse by mine employees and by other community members.[177]

The Government of Nunavut indicated during the Final Hearing that it disagreed with Baffinland's conclusion that the risk of importation of illegal substances through the Project site was moderate, and that in fact the GN felt that this risk would be high.[178]

In its final written submission to the Board, Aboriginal Affairs and Northern Development Canada (AANDC) recommended that, should adverse health outcomes be tied to Project interactions, that Baffinland be involved in the identification and implementation of mitigation measures.[179]

AANDC also noted in its final written submission to the Board that the mitigation measures as proposed in the Proponent's FEIS were positive steps to control Project linked effects of substance abuse, but that given the risk that substance abuse issues could result in significant adverse community impacts, additional objectives and indicators for substance abuse (e.g., alcohol consumption per capita) and consequent adverse social effects should be included in the socio-economic monitoring program developed for the Project. [180]

Further, AANDC's final written submission also recommended that socio-economic monitoring be maintained throughout the three year closure and five year post-closure phases and noted specifically, that collaborative monitoring of Project harvesting interactions and food security should include broader indicators of dietary habits in conjunction with any potential Qikiqtaaluk Socio-Economic Monitoring Committee monitoring program.

Health Canada indicated in its final written submission to the Board that the collection of data regarding baseline metal levels in soils in berry picking areas and in caribou organ meat in local study areas would contribute to establishing baseline concentrations of metals, and be of use in the interpretation of future data that might be collected.[181]

During its presentation to the Board, the Royal Canadian Mounted Police indicated that it belived the potential for spinoff effects exists in the communities from which employees are hired. The RCMP noted that it expects these effects would be related to the percentages of local labour and employees' new-found income.[182] The RCMPalso indicated in its presentation to the Board that after reviewing 28 months of evidence-based data from the Meadowbank mine site at Baker Lake, approximately 133 residents in that community of approximately 1500 have been employed by Agnico-Eagle Mines Ltd., and the that the total dollar value of the opportunity represents an annual income of approximately $8 million.[183] The RCMP also told the Board:

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[177] J. Eetoolook, NTI, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 416, lines 1-11.
[178] M. Noreau, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 641, lines 1-8.
[179] Aboriginal Affairs and Northern Development Canada, Final Written Submission, May 30, 2012.
[180] Aboriginal Affairs and Northern Development Canada, Final Written Submission, May 30, 2012.
[181] Health Canada, Final Written Submission, May 30, 2012.
[182] S. McVarnock, RCMP, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1211, lines 9-14.
[183] S. McVarnock, RCMP, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1211, lines 15-20.

…with certainty, that since 2008 to 2011 a total of four complete calendar years, [the RCMP] have noted at Baker Lake, calls for service have increased 22.5 percent…our prisoner count on the ground there has increased by 35 percent over the four-year period, and the Criminal Code workload, that means the percentage of those calls for service that involve court related activity, has increased by 36 percent. As of this morning, I can confirm that for the year 2012 to date, and I'll just take the first six months of this year, they have had 800 calls for service, versus 540 from the same period last year, so, again, they are trending to increase their activity from last year.[184]

Furthermore, the RCMP indicated that one of the factors contributing to Nunavut's remaining at or near the top level of the Criminal Code infractions in Canada is the level of alcohol abused in the territory. Using the Baker Lake example as presented above, the RCMP reported that it had examined the number of alcohol permits that that were issued in Baker Lake during 2009, the year before the Meadowbank Gold mine went into operations, and that there were approximately 3,000 permits issued in that community. In 2011, the RCMP noted that it did the same review, and there were 6,105 liquor permits issued in Baker Lake – meaning that in a 24-month range, Baker Lake saw a more than 100 percent increase in number of alcohol permits purchased, and it would stand to reason owing to the increased disposal income in the community.[185] As an indirect impact of the potential for increased policing activity, the RCMP suggested that ripple effects are created in other agencies and services, such as health, social services, the courts, probation, and corrections.[186]

A number of community members also provided comments to the Board regarding issues relating to human health and well-being, ranging from the availability and quality of country foods, to the availability of counselling and other health services for employees and community members.

A community member from Clyde River indicated support for having a mental health or social worker on site to provide assistance to employees:

Is there going to be a mental health worker or social worker that will be able to help people when they require help? We have social workers -- Inuit social workers, two of them, in fact, in our community. It's called the Ilisaqsivik Centre, and it's geared toward to helping Inuit with their social problems. I feel that there should be a similar setup at the mine site. An Inuit who can help Inuit that are working at the -- at the mine site, I find this very helpful talking one on one talking with someone of your own culture is very helpful because they know each other's social problems and lives, and I'm very proud that we have one in our community, so I wonder if that could be taken into consideration by the mining company?[187]

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[184] S. McVarnock, RCMP, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1211-1212, lines 26 and 1-14.

[185] S. McVarnock, RCMP, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1213, lines 11-22.

[186] S. McVarnock, RCMP, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1213-1214, lines 26 and 1-6.

[187] J. Apak, Clyde River, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1227-1228, lines 17-26 and 1-5.

A community roundtable participant from Kimmirut asked questions about accident insurance and the provision of medical assistance:

> *Do you have any insurance set aside if there were to be an accident of some type of malfunction? Or if a person that's employed at your camp at Milne Inlet, would there be insurance for them?...I wonder if there is some mechanism where we can be notified immediately if there was an injury to one of the people that was working up there that's a family member? Would there be a doctor on site? Will there be money set aside as well?*[188]

With respect to drugs and alcohol at the mine site, one community resident from Igloolik noted:

> *[At the Nanisivik mine] -- one of the restrictions were not to bring alcohol, not to bring drugs. But us workers there, we used to drink and we used to get drunk and we used to miss work. So my concern is: Are there going to be restrictions not to have alcohol and drugs…at the site*.[189]

Residents from Grise Fiord and from Pond Inlet provided testimony during the community roundtable sessions in Iqaluit and Pond Inlet regarding the effects of pollutants upon Inuit country food and other considerations affecting the availability of such foods to Inuit:

> *We are just part of the ecosystem that we have to adapt to the change and we're going to have to do that if we want to eat and still have country food to eat…airborne pollutants are coming from down south because the north attracts pollutants and it settles in the cold environment, and that's how we are affected in our country food.*[190]
>
> *The wildlife will be the most impacted…if their populations leave this area, we will have to think of [other] ways to get country food…maybe from other communities.*[191]
>
> *Everything cost very high at the Co-op store, the groceries, and the fuel that we need for hunting…and the wildlife is very hard to get now…it's very hard to go out on the land to hunt. I can't even afford to pay extra money for gas in order to get my country food.*[192]

Finally, Baffinland provided evidence relating to human safety considerations as such pertain to its proposed plan to allow harvesting by Inuit employees at Project sites:

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[188] A. Killiktee, Kimmirut, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1254-1255, lines 20-26 and 1-4.

[189] D. Angutimarik, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 24 (pm), 2012, p. 1749, lines 5-10.

[190] M. Kiguktak, Grise Fiord, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 1092-1093, lines 5-8 and 8-12.

[191] J. Arreak, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (am), 2012, p. 2447, lines 22-25.

[192] H. Kadloo, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2535, lines 20-24.

…safety is priority, due to the number of people at site, and…also want to make it…clear, too, that it is very rare for mines to allow hunting and fishing at site. Most mines have a no-hunting and fishing policy. One reason, you know, for this is, under the Nunavut Mine Safety Act, it's -- we have to -- workers must be given adequate rest in order to perform their duties. And, in the case for employees that will be working two weeks on-site and two weeks off, that means the -- the employees will be working 12-hour days, and that works out to a-hundred-and-sixty-eight hours that -- in that two-week period, that the employees will be working.[193]

5.5.3 Views of the Board

Baffinland has predicted that the potential for the Project to affect the health of non-employees would be limited owing to the distance of the Project from local communities. The Board however, after considering evidence presented by all parties, including the RCMP and members of the public, feels that the Mary River project has the potential to have significant positive and negative impacts on community dynamics and individual well-being which may result in effects to human health.

Cultural conflicts at site were not addressed in the Proponent's Final EIS, and the Board feels that these potential interactions should be considered within the Baffinland's development of cross-cultural awareness programs and mitigation measures to address any potential conflicts that may arise. As the Proponent could not indicate during the Final Hearing whether and how many southern Canadian or non-Canadian employees may be required at the Project over its lifetime, the Board has concerns that other cultural and/or language barriers at site may warrant additional awareness programming.

While the Board recognizes the Proponent's stated intention to have an Inuit Elder employed and on site at all times to act as a counsellor and mentor to Inuit employees and agrees that this would contribute positively to the well-being of Inuit employees on-site, the Board feels that a qualified mental health professional may also provide additional types of counsel counsel to employees on site, and would allow for the same support to also be extended to non-Inuit employees. In addition to concerns about this type of work being performed, depending on the number of Elders that Baffinland plans to employ on site at any one time, the Board is concerned about the quantity of work that may be necessary and expected of the Elder(s) on site. Additional support staff would assist to alleiviate any potential overloading of Elder employees at site.

The Board acknowledges Baffinland's plan to offer an employee and family assistance program and feels that this type of program, if extended to family members of the employee, would provide needed support to both the Project employee and his/her family.

Concerns raised by community members in Iqaluit regarding spinoff effects from in- and out- migration do not appear to have been adequately assessed by the Proponent, nor did Baffinland propose any measures which may alleviate the Board's concerns regarding these impacts.

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[193] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2474, lines 9-21.

The Board has concerns regarding the potential impacts to the human health and well-being of residents within the North Baffin region that may result from further indirect effects of the Project, such as substance abuse, family violence, sexually transmitted infections and other communicable diseases, marital problems, and gambling.

The Board has provided its views with respect to allowing Inuit employee's to undertake harvesting activities at Project sites in Section 4.9.3 and 4.12.3 of this report, noting that it has reservations about the Proponent's plan to allow this harvesting by Project employees during their work rotation. The Board feels that allowing site employees access to firearms and to travel away from site during what is intended to be their periods of rest poses unnecessary risk to employee health and safety.

5.5.4 Conclusions and Recommendations of the Board

The Board recognizes Baffinland's commitment to providing adequate medical services on site, and further recommends the following:

1. The Proponent is encouraged to employ a mental health professional to provide counseling to Inuit and non-Inuit employees in order to positively contribute toward employee health and well-being.

As noted in Section 5.1 of this report, the Board has concerns relating to the potential for in-migration to the City of Iqaluit and out-migration from other communities. The Board reiterates that the Project has the potential to significantly change the socio-economic environment within Nunavut and that significant in- and out-migration are possibilities that must be assessed and monitored throughout the life of the Project. The Board has previously recommended terms and conditions which require the monitoring of employee-related demographic factors which may have implications upon the human health and well-being of residents of the North Baffin region. The Board further recommends that:

2. The Proponent shall work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring Committee to monitor potential indirect effects of the Project, including indicators such as the prevalence of substance abuse, gambling issues, family violence, marital problems, rates of sexually transmitted infections and other communicable diseases, rates of teenage pregnancy, education rates, and others as deemed appropriate.

While the Board recognizes that Baffinland has plans to implement cultural-awareness and social programs at site and within various communities, it is further recommending the following:

3. The Proponent is strongly encouraged to provide the NIRB with an updated report on its development of mitigation measures and plans to deal with potential cultural conflicts which may occur at site as these may become needed. The reporting should be provided at least 60 days prior to the commencement of any construction activities.
4. The Proponent is encouraged to assist with the provision and/or support of recreation programs and opportunities within the potentially affected communities in order to mitigate potential impacts of employees' absences from home and community life.
5. The Proponent should consider providing counseling and access to treatment programs for substance and gambling addictions as well as which address domestic, parenting, and marital issues that affect employees and/or their families.

As was noted in Sections 4.9.3 and 4.12.3 of this report, the Board has reservations regarding the Proponent's consideration to allow harvesting by Project employees, and recommended that this be prohibited from occurring. The Board has recommended against allowing harvesting by Project employees during their work rotation, also to negate the human health and safety risk that would exist by allowing site employees access to firearms and to travel away from site during what is intended to be their period of rest.

5.6 Community Infrastructure and Public Services

5.6.1 Views of the Proponent

Baffinland indicated in its FEIS that although it would develop most of the infrastructure and provide most of the services demanded by the Project, some incremental Project related costs would be imposed directly and indirectly upon pubic infrastructure and services. Baffinland noted that the cost of this use in the case of the Mary River Project would be paid for through taxation, and that these contributions would more than outweigh Project-related use of public services and facilities.

In its FEIS, Baffinland suggested that the Project may create competition for skilled employees and that this may pose short-term difficulties for various Hamlet operations, which could in turn, place a strain on public services provided. It also predicted however, that the overall increase in the amount of skilled labour available would ultimately benefit Hamlet operations and local services.

Baffinland also noted that, should other projects in the region go forward, it would be possible that they could draw even more skilled workers away from communities, potentially causing disruption in municipal services and reduced capacity in local businesses and organizations. According to Baffinland however, local employment is perceived by many Inuit to be preferable as compared to fly-in/fly-out employment.[194]

Baffinland also concluded in its FEIS that any negative impacts on the availability of workers and community services would be short term in nature as Project-initiated training would lead to improved levels of skill and experience in the Inuit labour force.

The Proponent's FEIS further indicated that the Project would create substantial demand for infrastructure, particularly as related to transportation. Baffinland noted that some direct demand would also be placed upon public services and facilities as a result of the Project's development, such as making use of the public airstrips at Iqaluit and at the five communities supporting the fly-in/fly-out transportation of employees to the worksite(s). The FEIS indicated that Baffinland's transportation plans had been designed to avoid placing demands on airport facilities beyond established capacities.

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[194] FEIS, Volume 4, February 2012.

Baffinland's FEIS also indicated that some increased demand for other infrastructure may be expected to arise indirectly from the Project development, where for example, increased income may lead to more vehicles within a municipality and a subsequent need for road maintenance or improvements.

Baffinland predicted a direct impact to medical services as a result of increased medical check-ups as well as attending to work-related injuries that may arise at the mine site. It further noted in its FEIS that while it plans to mitigate the demand for these services by providing its own medical capabilities and staff on-site, some medical emergencies may require medical evacuation to hospital facilities in Iqaluit or Ottawa.

Baffinland's FEIS ascertained that Project has the potential to benefit land-based travellers as the Proponent plans to make Project shelters placed along the tote road available to anyone in an emergency situation.

Baffinland concluded in its FEIS that the Project would have a significant positive effect on the community infrastructure and public services Valued Socio-Economic Component, based on its assessment that no significant adverse residual effects on community infrastructure and services would arise from competition for skilled workers, and also based on the prediction of a significant development in labour force capacity.

5.6.2 Views and Concerns of Interested Parties

The Qikiqtani Inuit Association supported community members' concerns regarding increased pressure on communities resulting from projects such as Mary River, noting that "*Our communities do not have sufficient housing…we do not have sufficient health services…we do not have sufficient…basic infrastructure that these kinds of developments are putting pressure on.*"[195]

Further to this, a community member from Igloolik made reference to the need for infrastructure to mitigate impacts of familial separation:

> *I hope that there will be opportunity for infrastructure in our community, because there is, certainly, a need…if families are going to be separated from a mother and father for extended periods of time, there is going to be need for, for example – a skate park, or artificial turf…other things for young people to be able to access.*[196]

The Government of Nunavut indicated to the Board during the Final Hearing that it felt that Baffinland had not adequately assessed the effects of in-migration or the subsequent costs accruing to health care services to be provided to non-residents as a result of Project referrals and medical evacuations.[197] The

[195] O. Eegeesiak, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 25 (pm), 2012, p. 1922, lines 13-19.
[196] L. Idlout, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 25 (pm), 2012, p. 1956-1957, lines 26 and 1-8.
[197] N. Strijak, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 635, lines 1-4.

GN also made a number of recommendations, including that the Project effects to the its medical and social services be monitored, and that associated costs to the GN be recovered.[198]

The Government of Nunavut noted its concern with increased Project-related pressure placed upon he Iqaluit airport, and during the Final Hearing, recommended that the Board require Baffinland to include the GN's Iqaluit International Airport Division in its Transportation Working Group and that this working group give consideration to i) Scheduling; ii) Passenger management; iii) Use of airport lands or the Iqaluit Airport terminal and ancillary facilities (e.g., fueling, de-icing); iv) Operational and maintenance impacts and their mitigation; v) Reporting, problem solving and complaints resolution procedures; and vi) Other issues of mutual interest.

With respect to specific pressures that may be felt by, or within, the City of Iqaluit, Mayor Madeline Redfern provided testimony which indicated that the potential for in-migration would increase the demand for services offered and may cause other social strains as well, and further requested that the Government of Nunavut and Qikiqtani Inuit Association look at using Project revenues to address some of these needs:

> *We're already growing at 300 new residents per year, almost a thousand new residents every three years. As a result of this project, we actually believe that there will be additional in-migration from those northern communities…*[199]
>
> *In addition, right now we struggle to meet the current growth and demands. As more people move from the small communities into Iqaluit, it also adds pressure to us, as the municipality, to survey lots, to build new roads, to inlay pipes. In less than a decade, we will actually need a new secondary water source. More people, this will mean that it will be accelerated and need to happen sooner. Our landfill is already beyond its original design capacity. More people means more pressure, means another new site is needed sooner rather than later.*[200]
>
> *While we are not geographically close to this project, as I outlined, when and if there are negative social effects to those other five communities in the north Baffin, like the RCMP indicated earlier, if there is more alcohol brought in, if there is more crime, domestic violence, and injuries, there will be more people sent to Iqaluit to our hospital. There will be more people sent to the Baffin correctional centre, to the women's correctional centre, our young offenders' facility, and right now I can tell you that many people in our men's shelter and our women's shelter are not just Iqaluitimuit. They come from the other communities. They are already at capacity, so we need, as I said earlier, for the different levels of government and the Inuit organizations, as well as the mine, to realize that we are not only a point of hire.*[201]
>
> *If the royalties, as they currently are structured and understandably so, are paid directly to government and Inuit organizations, we would like recognition of these additional pressures and stresses. As I have outlined with infrastructure, we feel those pressures, we have to address them,*

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[198] N. Strijak, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 636, lines 18-26 and 1-24.
[199] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1262, lines 5-9.
[200] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1263, lines 15-25.
[201] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1264, lines 9-24.

but we get no royalties, and we get no direct payments. We would like it to be recognized that the government and the Inuit organization who will receive those need to collaborate and work with us so that we are able to meet and address those needs.[202]

5.6.3 Views of the Board

The Board is of the opinion that the Proponent may have overestimated its ability to provide health services to Project employees without costs accruing to the Government of Nunavut, and though it indicated that royalties would far outweigh costs associated with a demand on medical services, the Board recognizes that additional services and infrastructure must also be considered in determining whether and to what extend the royalties may offset costs incurred to the GN, noting also that not all related costs may surface during Project duration. For instance, an increase in alcohol consumption or effects of one parent away from home for extended periods of time may have lasting effects on the children of Project employees that may not begin to cost the GN for many years yet to come – at which point medical care or social services and counselling may be required. The causation of such a relationship is difficult to define with certainty; however the Board is of the opinion that the lasting effects of a project such as this may warrant additional scrutiny and a precautionary approach to considering these indirect consequences. Furthermore, the Board does not feel that the Proponent has adequately considered the effects of in-migration in terms of the demand for increased services and the associated costs to the health and social services provided by the Government of Nunavut.

Finally, the Board also notes that the demand for transportation services at all airports to be utilized by the Project, including those at point-of-hire communities and the Iqaluit airport, will have potential impacts upon the Government's ability to provide these services. The Board also acknowledges the potential stresses upon hospitality and other services providers within communities that may arise should flights transporting Project employees become stranded at any point within the North Baffin region.

The Board agrees with the Government of Nunavut's concern as expressed during the Final Hearing regarding the potential for increased demands to be placed upon the health care system, including standard medical care and emergency response and medical care services as well as mental health services.

The Board also agrees with the testimony provided regarding impacts to and increasing demands on infrastructure and services provided in and by the City of Iqaluit, and feels that the Government of Nunavut and the Qikiqtani Inuit Association should work together in order to ensure that Project benefits work to offset Project-related costs to infrastructure or services.

The Board futher heard evidence as presented by the Royal Canadian Mounted Police with regard to its experience with the Meadowbank Gold Mine now operating in the Kivalliq region, and has concerns with the potential for increases in income to lead to domestic issues, increases in crime and substance abuse, and to impact upon the levels of policing service that may be needed to manage Project induced changes in the North Baffin region.

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[202] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1264, lines 5-14.

5.6.4 Conclusions and Recommendations of the Board

The Board recognizes that the Project may place increased demand upon existing services and infrastructure as provided by the Government of Nunavut and other service providers. In order to best address the potential impacts posed by this increased demand, the Board is recommending that the Proponent engage with government and other members of the Qikiqtaaluk Socio-Economic Monitoring Committee in order to capture, where possible, the indirect consequences of the Project's development as follows:

1. The Proponent is encouraged to work with the Government of Nunavut and other parties as deemed relevant in order to develop a Human Health Working Group which addresses and establishes monitoring functions relating to pressures upon existing services and costs to the health and social services provided by the Government of Nunavut as such may be impacted by Project-related in-migration of employees, to both the North Baffin region in general, and to the City of Iqaluit in particular.
2. The Proponent is encouraged to work with the Government of Nunavut to develop an effects monitoring program that captures increased Project-related pressures to community infrastructure in Local Study Area communities, and to airport infrastructure in all point-of-hire communities and in Iqaluit.
3. The Government of Nunavut and the Qikiqtani Inuit Association are encouraged to cooperate to ensure in a broad sense, that Project benefits are distributed across impacted communities and across various demographic groups within these communities in a manner that best offsets any Project-related impacts to infrastructure or services.
4. The Government of Nunavut should be prepared for any potential increased need for policing, and ensure that the Royal Canadain Mounted Police is prepared to handle ongoing Project-related demographic changes and subsequent crime prevention that may be needed as a result of the development, operation, and closure of the Project.

5.7 Culture, Resources and Land Use

5.7.1 Views of the Proponent

Culture and Resources

Baffinland's FEIS indicated that general measures would be taken to respect and preserve the culture of Inuit employees while they are working. Baffinland has also expressed its support of the use of Inuktitut on-site, to be included in signage and in work units. It also indicated that it plans to provide traditional country foods in the Project cafeterias.

While Baffinland acknowledged that archaeological sites have been identified in Project areas that contain features and artifacts representing substantial degrees of area use throughout human past and the present, it has indicated that a number of important archaeological sites will be avoided by relocating Project infrastructure, while others may require protection through excavation, mapping, and artifact retrieval by a licenced archaeologist.

Baffinland's FEIS indicated that the Mary River Project, in combination with other foreseeable projects and with traditional harvesting activities, is not expected to result in significant negative cumulative effects to archaeological sites. It predicted that overall cumulative effects to land and marine use are not expected to be significant and that the Project would not likely result in significant adverse effects.

Land Use

In its FEIS, Baffinland predicted that the Project would interact with existing land uses by Inuit. Measures proposed to support these activities include check-in procedures at Project sites and a focus on public safety for the Milne Inlet Tote Road and the Railway. The ship track through the landfast ice in Steensby Inlet would be expected to affect existing on-ice travel routes during the winter. To mitigate this, Baffinland proposed the establishment of a clear and safe detour route around the port site and to accommodate travellers at Steensby Port, and the provision of meals and additional fuel as required by travellers re-routed around Project areas.

Baffinland's assessment predicted a low magnitude and infrequent frequency of collision mortality of caribou resulting from the Project. As such, it concluded that the effect on quantity of caribou harvested per level of effect was assessed to be not significant.

Baffinland's FEIS further concluded that, based on studies conducted, there would not be a noticeable change to the abundance and distribution of caribou and that harvesting was therefore not expected to be significantly affected either in terms of quantity or effort needed.

Baffinland also stated that several travel routes cross the proposed Railway alignment, most of which would be used by snowmobiles, and some by all-terrain vehicles (ATV). Snowmobile crossings would be possible at most but not all locations during snow cover and so the FEIS acknowledged that the Railway corridor could cause hunters to detour to find a suitable crossing. To ensure the ability of humans to safely cross the rial line, specific mitigation measures were proposed in Baffinland's Railway Management Plan.

Baffinland predicted that, based upon all the studies done on marine mammals, the Project would be expected to have a minor effect on marine mammal harvesting. It further indicated that the Project would have a negligible effect on fish harvesting, which would it suggests would be a secondary activity while Inuit are out on the land hunting for larger game.

As a precautionary measure, Baffinland indicated that it plans to undertake a monitoring program and to develop an adaptive management plan as described in the Shipping and Marine Mammal Management Plan[203]; in order to address effects to marine mammals which may result in limitations to harvesting.

Baffinland noted that as Project sites are industrial in nature, all Inuit passing through any Project sites would be encouraged to check in at a Project office in order to make their presence known.

In its FEIS, Baffinland noted that it expects that any negative effects to the land or to harvesting from the Project would be minimized. It further indicated that positive effects on the ability of Inuit to harvest

[203] FEIS, Volume 10, Appendix 10D-10, February 2012.

may also be realized, should mine employees use some of their earned income to go out on the land, to support other hunters, or to purchase country food, however Baffinland noted that this overall impact remained uncertain.

Baffinland futher acknowledged that Project activities such as shipping have the potential to disrupt the "wilderness experience" that tourists enjoy but noted that since the industry is small, and the frequency of interactions with tourists would be low, the resulting impact would not be significant.

Baffinland asserted that Steensby Inlet is an area actively used for travel by water and landfast ice. Its FEIS noted that Steensby Inlet is a part of a main travel route for residents from Clyde River travelling to Igloolik and for residents from Igloolik and Hall Beach who travel inland. The Proponent noted that Project development may have a negative impact on direct travel on landfast ice across Steensby Inlet unless mitigation measures are developed and implemented. Baffinland further indicated that on-ice activities would still be possible; but that a detour around the ship's track would be required. To address safe travel across the Steensby Inlet, Baffinland has proposed to set reflective markers along the ice to identify ship tracks and to mark out the safest route for travelers.

Baffinland has committed to undertake no shipping from the Milne Port during the winter season, and has concluded that there would therefore be no interactions with travellers in this area during this season. Project-related shipping through Pond Inlet to Milne Inlet is not expected to meaningfully affect use of the open water by hunters in boats, although vessel sightings will occur. While the ships will not have an effect on people's ability to travel, consideration must be made to public safety. Baffinland plans to address and mitigate potential impacts by holding community public safety awareness campaigns, informing the community of vessel movements, tracking the route and timing of passage, and by holding periodic public meetings and information sessions to discuss issues related to travel safety.

Baffinland acknowledged that shipping, port activities and rail line operations related to the Project have the potential to cause socio-economic effects, for example by affecting Inuit travel. Mitigation measures in place to offset the inconvenience or hardship created by such changes include: (1) Providing fuel to offset the additional costs for traveling around the Steensby Port site and associated shipping route; (2) Providing food and shelter at Project facilities.

Baffinland further provided an example of how it had responded to community concerns during the Final Hearing:

> *In April of 2010, at a community consultation with Cape Dorset, it was clear to them that they would prefer us to go to the south of Mill Island, so this is a good example of our – of Baffinland responding to community concerns, and at that time, we came up with the alternative to go south of Mill Island.*[204]

Baffinland acknowledged that the Project may interact with current travel patterns; however, if proposed mitigation measures were in place, it concluded that these effects would not be significant. It

[204] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1194-1195, lines 23-26 and 1-3.

suggested that the ability of individuals to travel and camp throughout the land use study area would not be meaningfully altered, and suggested that any negative effects which do arise would only be evident at points of Project interaction including the Milne Inlet Port, Milne Inlet Tote Road, the mine site, Railway, and the Steensby Inlet Port.

5.7.2 Views and Concerns of Interested Parties

The Government of Nunavut indicated during the Final Hearing that issues identified previously throughout the Review of the Project as relating to the development and implementation of mitigation plans for archeological sites had been clarified and resolved to the satisfaction of the Department of Culture and Heritage.[205] The GN also concluded during its presentation that while it expected that the Project would directly and indirectly affect archaeological resources located within the Project development areas, impacts to these resources would be negligible, based upon its understanding of Baffinland's compliance with indicated mitigative measures and monitoring programs.[206]

Community members also raised questions and expressed concerns regarding the Project's potential to impact archaeological sites and current land users, specifically requesting during the Hearing that Baffinland be careful with wildlife and with archaeology sites. [207]

The Canadian Transportation Agency recommended in its written submission to the Board that Baffinland consider the development or adaptation of an educational plan similar to Transport Canada's Operation Life Saver, and that it deliver such a program in communities that would likely come into contact with the Railway while travelling across the land.[208]

Community roundtable representatives also expressed concern regarding the changes to the land that may result from the construction, operation and eventual removal of the Railway and embankment,[209] and also with regard to changes to the physical landscape at Mary River:

> *…it's always been a concern of mine that I want to express, "Nuniak" [sic] Nuvuit -- in Inuktitut literally means the "buttocks" or "backside," and in English it's called "Mary's River" -- "Mary River." In Inuktitut, the literal name is Nuniak, like, the way those two mountains, the appearance. So that's been a concern of mine. And it's been repeated over and over, like the deposit, like, once the deposit is exhausted what -- we need to change the name. Maybe we can say only one, partial buttock, literally it means "buttock."*[210]

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[205] D. Stenton, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 595, lines 13-17.
[206] D. Stenton, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 595-596, lines 18-26 and 1-6.
[207] L.Uttak, Igloolik, NIRB Final Hearing File No.: 08MN053 Transcript, July 24 (am), 2012, p. 1602, lines 10-12.
[208] Canadian Transportation Agency, Final Written Submission to NIRB, May 30, 2012.
[209] M. Kiguktak, Grise Fiord, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 1004-1005, lines 17-26 and 1-2.
[210] J. Killiktee, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 28 (pm), 2012, p. 2740-2741, lines 17-26 and 1-2.

For those of us that are residents of Pond Inlet, we're going to have to say bye because the buttocks will be ironed out -- they will be mined out. We'll never come back, the buttocks that's there. That's the meaning of "Mary River" in Inuktitut. We'll have to say bye to the Two Hills that are there. We'll say bye. We won't say "Mary," we'll say, Bye, buttocks. It's true. It -- it -- it's a nonrenewable resource.[211]

Other participants during the community roundtable session expressed concerns regarding the potential impacts of the shipping route, specifically noting that:

We have concerns about where the polar bear and whales are going to be impacted because the shipping route is right between [Coral Harbour] and Cape Dorset and we survive on our wildlife from that area and it's going to be right on the shipping route.[212]

My big concern is it will be affecting the lifestyle of northern Baffin Island. And also, on an annual basis, we have Nunavut dog Quest sled race. Residents of Pond Inlet, Igloolik, Arctic Bay, Clyde River participate. And in either one of these years, the route -- like, the proposed shipping route is used by the dog racers, and as the participants keep increasing, they want to showcase their culture, the Inuit culture. And, also, as more dog races are underway, our hockey players also tag along. And the hosting community is where they have hockey games or hockey tournaments. Residents of Pond Inlet, Clyde River, and Igloolik, when they travel to other communities in the large groups of them, will they be able to cross the ships' tracks?[213]

A community round table participant from Cape Dorset further noted that:

If I was to go on the qajaq, I can paddle from Cape Dorset to Mill Island that's how close it is, but after that once you start operating the shipping and using it at a shipping route, we won't be able to do [that] anymore. I'm just saying that that area, it's our access as hunters. It's not about myself. It's about my children and my grandchildren. I'm concerned about them.[214]

Other community roundtable participants also expressed a preference that North Baffin communities be kept informed on a regular basis as to the location of shipping tracks, and that they be provided with updated information as such may pertain to ship movements that could impact the wildlife habitat upon which Inuit depend.[215]

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[211] S. Omik, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 28 (pm), 2012, p. 2713, lines 18-25.
[212] M. Nakoolak, Coral Harbour, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, p. 998, lines 20-25.
[213] A. Kublu, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 28 (pm), p. 2683-2684, lines 16-26 and 1-5.
[214] A. Nuna, Cape Dorset, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 1085, lines 17-24.
[215] S. Angootealuk, Coral Harbour, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1235, lines 20-24.

5.7.3 Views of the Board

The Board feels that the Proponent has not addressed the effects of project interactions with traditional activities as completely as was required by the EIS Guidelines.

The Proponent has indicated that service bungalows along the Railway would be available for use by Railway employees[216] however the Board notes that these same buidlings are not planned to be available for other employees or travelers who may find themselves stuck in adverse weather or emergency situations. The Board agrees with providing service bungalows for Railway employees' use, but has also provided Terms and Conditions that require emergency shelters to be placed along both the rail line and Milne Inlet Tote Road and which are to be made available for use by all Project employees and members of the public. These shelters are required to provide shelter in the event that Project employees or other land users become stranded due to inclement weather, equipment failure or other unforeseen circumstances.

During the Final Hearing, Baffinland committed to working with the Qikiqtani Inuit Association to set up visits and consultations with a number of communities to explain various aspects of the Project's interaction with the public.[217] The Board feels that early, ongoing, consistent consultation with affected communities will assist in ensuring the Proponent's mitigative measures are successful in all aspects where such are designed to mitigate impacts to land users, and are especially important in educating the affected populations with respect to safety on the land. After hearing from members of the public during the Final Hearing, the Board also feels that post-project authorization consultation is essential to the successful development of the Mary River Project.

The Board feels that the Proponent's analysis of potential impacts to wildlife resulting from project interactions is lacking owing to current data gaps for wildlife populations such as caribou and marine mammals. As such, the Board feels a precautionary approach should be taken wherever such interactions have the potential to adversely impact upon the traditional harvesting or other cultural pursuits of Inuit.

The Board agrees with those North Baffin residents who asked that communities be kept informed on a regular basis as to the location of shipping tracks, and updated information regarding Project ship movements.

The Board acknowledges that Project shipping activities during ice cover conditions have the potential to disrupt on-ice travel routes and to pose danger to ice users – caused both by the shipping track itself, and by newly created, unpredictable cracks that may result from the shipping. While the Board is encouraged by Baffinland's plans to provide compensation to hunters that may be diverted around Steensby Inlet and the shipping route and it recognizes the limited number of travellers who may be impacted and the infrequent likelihood of such occurring, the Board does not feel that Baffinland has adequately considered the associated safety precautions that may be required as a result of diverting travellers from known and established travel routes.

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[216] M. Sheahan, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 374, lines 4-9.
[217] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 456, lines 1-6.

5.7.4 Conclusions and Recommendations of the Board

In providing recommendations with respect to all aspects of the Project, the Board encourages the Proponent to involve Elders and community members in the development and revision of its monitoring and mitigative plans, and that this consultation is ongoing and consistent:

1. The Proponent should make all reasonable efforts to engage Elders and community members of the North Baffin communities in order to have community level input into its monitoring programs and mitigative measures, as this type of engagement will ensure that these programs and measures have been informed by traditional activities, cultural resources, and land use as such may be implicated or impacted by ongoing Project activities.
2. The Proponent shall continue to engage and consult with the communities of the North Baffin region in order to ensure that Nunavummiut are kept informed about the Project activities, and more importantly, in order that the Proponent's management and monitoring plans continue to evolve in an informed manner.

As the Proponent noted that human-Project interactions would be likely, the Board feels that measures designed to ensure human safety are necessary, including the following:

3. The Proponent is required to provide notification regarding scheduled ship transits throughout the regional study area, real-time data regarding ships in transit and any changes to the proposed shipping schedule. This information shall be provided on a monthly basis at a minimum or more often as the Proponent determines necessary and will be provided to the Proponent's community liaison officers and those of the Qikiqtani Inuit Association as well as the Hunters and Trappers Organizations and Hamlet organizations of the North Baffin communities, Coral Harbour, and the NIRB's Monitoring Officer. Where deviations from the proposed schedule or routing are required, this information shall be provided as soon as possible.
4. The Proponent is strongly encouraged to provide buildings along the rail line and Milne Inlet Tote Road for emergency shelter purposes, and shall make these available for all employees and any land users travelling through the Project area. In the event that these buildings cannot, for safety or other reasons be open to the public, Baffinland shall set up emergency shelters (e.g. seacans outfitted for survival purposes) every 1 kilometre along the rail line and Milne Inlet Tote Road. These shelters must be placed along Tote Road and rail routing prior to operation of either piece of infrastructure, and must be maintained for the duration of project activities, including the closure phase.
5. The Proponent should ensure through its consultation efforts and public awareness campaigns that the public have access to shipping operations personnel for transits into and out of both Steensby Inlet port and Milne Inlet port, either via telephone or internet contact, in order that any questions regarding ice conditions or ship movements that could assist ice users in preparing for travel may be answered by Project staff in a timely fashion.

5.8 Benefits, Royalty and Taxation

5.8.1 Views of the Proponent

It is anticipated that the Mary River Project would generate various streams of revenue to the federal and territorial government, including taxes on inputs of labour and materials, income and payroll taxes and taxes on corporate profits. In addition, the Proponent will pay for the iron ore that it extracts from the land in the form of "resource royalties" that will be paid to the federal government to be transferred to Nunavut Tunngavik Inc., the resources owner of Deposit #1, as set out in the NLCA. In addition, benefits will be paid to Inuit under an Inuit Impact and Benefit Agreement (IIBA) to be negotiated between the Proponent and the Qikiqtani Inuit Association as required under Article 26 of the NLCA.

As outlined in section 12 of Volume 4 of the FEIS, Baffinland indicated that the following benefits, royalty and tax payments would be associated with the Project:

- mining royalty payments to the Federal Government, that are then transferred to Nunavut Tunngavik Inc. (NTI);
- royalties to the Federal Government and to the Qikiqtani Inuit Association (the QIA) for aggregate materials extracted from quarries in the project area;
- corporate income tax to the Federal Government, Government of Nunavut (GN) and other governments;
- employee payroll tax remitted to the GN (but rebated to employees that are Nunavut residents);
- fuel tax charged on the import of specified fuel types (excludes fuel used for heating) paid to the GN;
- property tax (assessed on the basis of assessed value of the mine once constructed) paid to the GN;
- other taxes and payments (such as worker place safety and compensation, Canada pension plan and employment insurance) remitted to the Federal Government, GN and other governments; and
- the payments and other benefits that Baffinland is responsible to provide under the Inuit Impact and Benefit Agreement (IIBA) that is being negotiated with the QIA.

The Proponent estimates that during construction approximately $12.4 million in project tax revenues will be paid to the GN, with that amount increasing during operation to approximately $17 million. Given the uncertainty with respect to the multitude of variables and assumptions that will affect the future payment of tax on net corporate income to the GN, the Proponent did not include an estimate of the contribution of the additional corporate tax that would also accrue to the GN. As presented by Baffinland at the Final Hearing, the total predicted aggregate revenues over the mine life would be:

> *Based on the range of iron ore prices and other assumptions, the Mary River project, the 20-year mine life, is expected to generate an estimated 3 billion to 5 billion in total revenues to the federal treasury. This is including direct, indirect, and induced effects. Now, on top of that another 2 billion to $5 billion in taxation and royalty payments will be paid to the Government of Nunavut and the Nunavut Tunngavik Incorporated over*

the life of this project. Financial provisions of the Inuit Impact and Benefit Agreement are not included in these estimates.[218]

With respect to the terms and status of the Inuit Impact and Benefit Agreement, at the Final Hearing the Proponent advised the Board as follows:

> *I'd like to touch base a little bit on the status of the Inuit Impact and Benefit Agreement. Back in 2009, Baffinland and the Qikiqtani Inuit Association agreed, through a memorandum of understanding, on a schedule of economic provisions for the project moving forward, and these have formed the basis for ongoing negotiations for an Inuit Impact and Benefit Agreement. Sections of the agreement address but are not limited to the following: training, employment, contract and business opportunities, financial provisions, workplace conditions, marine shipping, and wildlife compensation. An executive committee will oversee the implementation of the agreement, and a management committee will monitor the project on a continuous basis and provide ongoing Inuit input for environmental and social monitoring.*
>
> *Now, regarding the status of the agreement, documents are now in the hands of respective counsel for the Qikiqtani Inuit Association and Baffinland who are working toward resolution of outstanding issues and completion of final legal text for execution by the parties. The legal agreements were not ready to sign before these final hearings, and further meetings are to be scheduled to bring closure to remaining issues.*[219]

On the basis of the benefits, royalty and tax payments that would be associated with the Project, the Proponent concludes that the Project would have a significant beneficial effect on the Benefits, Royalties, and Taxation VSEC. In addition to the direct payments, the Proponent also indicated the Project is expected to reduce social entitlement program expenditures, by, for example, reducing the demands on the territorial income support program in the region and social housing subsidy, while only modestly increasing demands for discretionary social spending in areas such as early childhood education and daycare, education and training programs and discretionary community infrastructure and services.

5.8.2 Views and Concerns of Interested Parties

Nunavut Tunngavik Inc. (NTI) noted that the resource revenues received from Baffinland will be allocated based on the internal NTI Resource Revenue Policy, and that consistent with the NTI Mining Policy, NTI will support and promote mining development provided that negative impacts to Inuit social lives and cultures are minimized and "…positive benefits, such as employment, education, training,

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[218] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp. 394-395, lines 19-26 and lines 1-3.

[219] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp. 413-414, lines 11-26 and 1-8.

business and investment opportunities, royalties and other revenues and infrastructure are maximized."[220]

Similarly, the Qikiqtani Inuit Association (QIA), focused their submissions on ensuring that the Project yields "sustainable" economic benefits and that challenges to realizing on benefits be realistically included in the assessment of the benefits associated with the project.[221]

The Government of Nunavut (GN) indicated that although they took no issue with the method of generating the estimates of tax revenues accruing to GN included in Baffinland's FEIS, the Board should be aware that these estimates are gross revenue estimates and did not include any of the tax rebates or credits that could accrue, which could significantly reduce the net amount of tax revenues actually received by the GN.[222]

The GN also noted that in addition to the tax-based revenues that would result from the project, Baffinland has also expressed the intention to negotiate a voluntary "Development Partnership Agreement" with the GN that could also yield additional negotiated benefits such as:

> *organizational infrastructure, physical infrastructure, communications infrastructure, education or training, perhaps investment into programs, community development, more services or programs or initiatives within the communities themselves working with the hamlets through the Government of Nunavut, as well as business development and building the capacity of businesses—local Nunavut and Inuit businesses.* [223]

However, the GN indicated that no formal discussions regarding the Development Partnership Agreement have, as yet taken place between Baffinland and GN.

Aboriginal Affairs and Northern Development Canada (AANDC) noted that both the Territorial and Federal Governments have a significant role to play in managing the issues associated with the significant economic impacts that would be associated with the Project:

> *I don't think there's any point in denying that there will be tremendous impacts, positive and negative, with the wealth that's generated in the communities from the mine, but I don't think it's just -- or we don't think it's just the company's issue. I think there is a role for both the territorial and federal government, and I'm happy to put that as a recommendation to the Board.*[224]

As conceded by Baffinland, given the structure of the NLCA and the manner in which royalties and tax payments would be paid by the Proponent to the GN, AANDC, NTI and the QIA, local governments are

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[220] J. Eetoolook, NTI, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp. 469-470, lines 24-26 and line 1.

[221] See for example the statements of O. Eegeesiak and S. Wiliamson Bathory, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp. 482-485.

[222] D. Carlson, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 638-639.

[223] D. Lapierre, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 26, 2012, p. 2239, lines 10-17.

[224] R. Aitken, AANDC, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 435, lines 3-10.

not in line to receive revenues flowing directly from the project. Municipal authorities and residents in the North Baffin Region, expressed concern, and as noted by Baffinland directly in the FEIS, skepticism, regarding the extent to which the residents and communities likely to be most directly affected by the Project Proposal would receive a fair share of the benefits:

> *If the royalties, as they currently are structured and understandably so, are paid directly to government and Inuit organizations, we would like recognition of these additional pressures and stresses. As I have outlined with infrastructure, we feel those pressures, we have to address them, but we get no royalties, and we get no direct payments. We would like it to be recognized that the government and the Inuit organization who will receive those need to collaborate and work with us so that we are able to meet and address those needs. Too often we're forgotten about. We are a tax-based community, but we do not have enough money to address these. We receive a transfer from the Government of Nunavut, but it fails to recognize that we don't only serve our community. We also serve the region and the territory. We would like to see an additional criteria for us being a regional centre when and if the Inuit organizations and the Government of Nunavut begin to develop policies and determine how to allocate those resources to the affected communities.*[225]

In addition, community representatives expressed concern that there was no clear indication regarding the approach to be employed in the allocation of benefits amongst communities in the North Baffin:

> *…do the QIA or NTI have plans on benefits that will be distributed to the communities, mostly Pond Inlet, Igloolik, and other most-impacted communities? …do QIA and NTI believe it is important to share benefits with communities that may not have the same opportunities to the benefits from the mining?...Like we said, we do not have economic base here in north Baffin and need assurance that Inuit can take part and participate in all… aspects of proposed Mary River project.*[226]

5.8.3 Views of the Board

As recognized by all the participants in this Review, there is no question that the Mary River Project Proposal has the potential to contribute significant economic benefits to the North Baffin Region, the Government of Nunavut, the Federal Government and the resource and land owners, NTI and the QIA. Although the Board recognizes that it is difficult to quantify, at this point, the exact value of these benefits given the many variables that will affect the actual value of the net benefits received, even assuming the actual economic benefits that result are at the very conservative end of the range, the potential economic benefits remain positive and significant.

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[225] M. Redfern, Iqaluit, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1263, lines 5-24.

[226] J. Nutarak, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, pp. 2508-2509, lines 17-26 and 1-5.

However, as noted during the Hearing, it must be kept in mind that the potential positive economic benefits must be viewed in context, with the recognition that the Project would result in additional costs imposed on federal, territorial, regional and local governments to address project effects, such as increased pressure on regional housing supplies, policing/justice requirements and strains on infrastructure such as local airports. Further, for the communities most likely to see these infrastructure strains, there is currently no mechanism to ensure that the taxes, royalties and benefits paid by the Proponent are allocated to addressing Project-related effects on communities. In this respect, community members would have liked to see specific commitments from the recipients of economic benefits regarding the allocation of community-specific benefits to address the particular infrastructure strains in particular communities:

> *But I'm glad, the fact that there is going to be different ways of making income. And Pond Inlet is closest community -- community to -- to Mary River project. An it's also going to be impacted. In -- and in Pond Inlet, we'd like to get benefits package, and I would like to see a community dock to be built, and -- and that is important. We need a dock, anyhow. A new airport, a bigger airport or international airport. When people go to Iqaluit and airport is going to be very busy once the Mary Rivers -- River project is open, but I think we should have an international airport. And we need a port here now, on behalf of our community, and -- like, it's -- there's going to be traffic once the project is open.*[227]

There are also concerns with respect to a gap in the timing of benefit payments, recognizing that for some communities, infrastructure strains may occur immediately when project shipping and construction commence, while the payment of items such as royalties and corporate taxes may not commence until much later, after construction is complete and the mine is in full production. The Board has concerns that this timing gap between increased stresses on local and regional government capacity and the revenue to support such activities must be considered and accounted for by all who share responsibility for the development and support of communities likely to be immediately affected in this way.

5.8.4 Conclusions and Recommendations of the Board

The Board shares the concerns of communities that given the current structure of benefits, royalties and tax payments communities have no assurance that benefits will flow directly to them when they experience strains on their existing capacity attributable to the effects of the project. As noted by AANDC, addressing this issue is not the sole responsibility of the Proponent, but rather requires all the parties receiving benefits to undertake, on an on-going basis over the course of the project lifecycle, consultation with the communities experiencing project effects to ensure that those most directly impacted also receive their fair share of the benefits.

As identified by the Government of Nunavut (GN), the Proponent has indicated their willingness to enter into a Development Partnership Agreement with the GN, and the Board views this as one mechanism

[227] N. Inuarak, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2544, lines 4-17.

that may be helpful to address some of the Board's concerns regarding the lag between increased demands for community services in advance of significant revenue flows.

Therefore, the Board recommends that:

1. Baffinland and the Government of Nunavut, will, as soon as practical following the issuance of the Project Certificate, enter into discussions to negotiate a Development Partnership Agreement.

5.9 Governance and Leadership

5.9.1 Views of the Proponent

As outlined in Volume 4 of the FEIS, section 13, the Project is considered to fit well with the strategic priorities identified for both for the region and also specifically for the communities of the North Baffin. Specifically, the Proponent states that the Project is consistent with the Government of Nunavut (GN) Economic Development Strategy and "Parnautit", the GN Mineral and Exploration Mining Strategy.[228]

Baffinland also proposed to establish an effective Inuit Impact and Benefit Agreement (IIBA) governance regime, consisting of an Executive Committee with overarching responsibility for the fulfillment of the IIBA and a Management Committee to continuously monitor and report on progress under the IIBA. With respect to the GN, Baffinland will notes that this component may also be advanced by future negotiation of a Development Partnership Agreement.

Baffinland identified that through partnership with the Qikiqtaaluk Socio-economic Monitoring Committee (Q-SEMC), Baffinland will contribute to socio-economic monitoring important to the region's leadership.

On this basis, the Proponent projects that the Project would have a positive and significant effect on the Government and Leadership VSEC.

5.9.2 Views and Concerns of Interested Parties

GN acknowledged at the Final Hearing that the use of the Q-SEMC is an appropriate mechanism for contributing to socio-economic monitoring:

> *The Qikiqtaaluk socioeconomic monitoring committee is a proper, appropriate venue to share monitoring efforts and information about effects being felt in the communities,*

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[228] NIRB Final Hearing File No.: 08MN053, Exhibit 55: Government of Nunavut Mining policy "Parnautit: A foundation for the future", filed by Baffinland, July 26, 2012.

priorities are set, indicators identified, issues discussed in detail, and possible solutions. Mitigation can be discussed for taking back to decision-makers for a consideration.[229]

The QIA acknowledges contribution and participation of Baffinland on Q-SEMC as central feature of adaptive management and demonstrating leadership, but identifies concerns regarding the potential for limits in the capacity of Government representatives to participate as a risk to the fulfillment of the Committee mandate.[230]

With respect to leadership and governance, during the Final Hearing several community residents and members of the public emphasized the need for the parties to show leadership in terms of transparency and accountability in order for communities to gain a complete understanding of project benefits and impacts: "When things are in an open and transparent way, then we can move, all smooth, together and keep moving forward, because we cannot have secrets."[231]

In the communities most likely to experience direct project effects many speakers expressed uncertainty regarding how benefits, and even if, benefits associated with the Project would be provided to the affected communities:

> *those of us -- Pond Inlet community will not receive any royalties from the mine, although we are right close to the mine, and the royalties will be going to NTI and the Inuit organizations, and I have heard that down south when there is a proposed mine that the immediate overlying communities receive royalties from the mining companies. I want that for our community of Pond Inlet. I want to see actual monies coming to our communities…this project is going to be huge in Mary River, and I'm sure that our wildlife, our beluga and narwhal, around Pond and Clyde and Arctic Bay area are going to start to migrate somewhere else, and that's why we should be compensated for that as an individual, but I can't say very much, as an individual, that I will probably never see compensation because it states the royalties have to go to NTI or the Inuit organizations.*[232]

This lack of awareness and understanding of the receipt, administration and allocation of benefits in the communities closest to the Project emphasizes the need for Baffinland and all parties receiving economic benefits to work together to provide timely and ongoing reporting to the communities in North Baffin Island. The importance of transparency and credibility in communicating about economic benefits was summarized by Lloyd Lipsett:

> *Therefore, we suggest that all parties that will be administering economic benefits that flow from the mine should set an appropriate example about transparency and access to information in order to, one, facilitate the accurate assessment of positive human rights*

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[229] R. Katsak, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 624, lines 20-26.
[230] S. Williamson Bathory, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp. 502-503.
[231] L. Uttak, NIRB Final Hearing File No.: 08MN053 Transcript, July 25 (pm), 2012, p. 1913, lines 6-8.
[232] G. Kilukishak, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, pp. 1134-1135, lines 9-20 and lines 4-12.

benefits from the mine, and, secondly, to reinforce public confidence in the contribution of the mine to sustainable development.[233]

5.9.3 Views of the Board

The Board agrees with the parties that the use of the Q-SEMC will be an essential component of effective adaptive management of socio-economic effects and with the on-going commitment and active participation by the parties on the Q-SEMC, the Project may make a significant contribution to regional and territorial socio-economic data. However, for the Q-SEMC to operate effectively, there is a significant need for all parties to commit to contributing, coordinating with existing monitoring programs, including the Nunavut General Monitoring Program established under the NLCA,[234] and communicating the results of project-specific monitoring data generated to the communities affected.

As discussed in previous Board decisions,[235] under the NLCA, Article 12 Sections 12.7.4 and 12.7.5, the role of the Board with respect to the establishment of monitoring programs is to focus the terms and conditions in relation to project, and the Board is mindful of the requirements to avoid duplication but facilitate co-ordination in the project-specific monitoring programs required by the NIRB.

5.9.4 Conclusions and Recommendations of the Board

As the Board recognizes that the objectives of the Qikiqtaaluk Socio-economic Monitoring Committee (Q-SEMC) and co-ordination with other, more general monitoring programs will most likely extend well beyond the project-specific monitoring required for this Project Proposal, the Board is not recommending the specific terms of reference. With respect to the participants who should be members of the Q-SEMC, the Board requires Baffinland to participate over the life of the project, but recognizes that given the 25 year projected time horizon, the participation of regulatory authorities and the QIA may change over time and has, therefore declined to recommend the participation of parties other than the Proponent.

Although the Board has not recommended particular terms of reference for the Q-SEMC's monitoring of project effects, the Board is, however, recommending that to ensure the monitoring data generated supports the assessment of regional and cumulative socioeconomic effects of the Project:

1. The specific socioeconomic variables set out in Section 8 of the Board's Report, including data regarding population movement into and out of the North Baffin Communities and Nunavut as a whole, barriers to employment for women, project harvesting interactions and food security, and indirect Project effects such as substance abuse, gambling, rates of domestic violence, that are relevant to the Project be included in the monitoring program adopted by the Q-SEMC.

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233 L. Lipsett, NIRB Final Hearing File No.: 08MN053 Transcript, July 23 (pm), 2012, p. 1477, lines 19-26.

234 As noted by R. Aitken, AANDC, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (pm), 2012, p. 2284, lines 7-14.

235 See the most recent discussion in NIRB File No.: 03MN107, Final Hearing Report for the Meadowbank Gold Project, August 30, 2006, at pp. 78-82.

To address concerns about transparency in relation to the economic benefits associated with the Project and recognizing an overarching request from communities to be kept informed, the Board is also recommending:

2. The Proponent provide an annual monitoring summary to the NIRB on the monitoring data related to the regional and cumulative economic effects (positive and negative) associated with the Project and any proposed mitigation measures being considered necessary to mitigate the negative effects identified.

6. OTHER MATTERS TAKEN INTO ACCOUNT

6.1 Accidents and Malfunctions

6.1.1 Views of the Proponent

As was required by the NIRB's EIS Guidelines, Baffinland's FEIS provided a listing of potential accidents and malfunctions associated with project activities as well as proposed plans and measures designed to address each potential occurrence. The assessment included those malfunctions and accidents with a reasonable probability of occurring, with risks assessed based on operational controls implemented on the basis of best management practices as outlined in Baffinland's Environmental Health and Safety Management System. Baffinland's FEIS defined the level of risk attributed to each potential occurrence by giving consideration to the severity of the consequences and the likelihood of occurrence.

Baffinland noted during the Final Hearing that its approach to preparedness would involve ensuring compliance with relevant regulatory requirements, focusing on prevention during Project planning and design, implementation of effective management plans, and maintenance of well-trained emergency response teams on site at all times.[236] Baffinland also noted in its FEIS that it plans to place considerable efforts into the development of management plans to aid in the prevention of accidents.

During its Final Hearing presentation related to accidents and malfunctions, Baffinland acknowledged the potential for fuel spills to occur during its fuel resupply operations, indicating that potential spills may occur during ship to shore transfer of fuel from the overwintered fuel vessel at Steensby Inlet, and that spills may also occur in transit along the shipping route.[237] Baffinland further concluded that the risk of a spill along the shipping route due to a breached ship hull would be unlikely considering the prevention measures that it plans to take and that it plans to strictly adhere to the "rules of the road" for shipping.[238]

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[236] F. Beaulac, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 301, lines 3-10.
[237] F. Beaulac, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 298, lines14-23.
[238] F. Beaulac, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 330-331, lines 25-26 and 1-11.

During the Final Hearing, Baffinland described its approach to emergency response with respect to Railway operations as involving a focus on incident prevention and preparedness. It also noted that it would consult with Transport Canada and the Canadian Transportation Agency and incorporate recommendations made by these agencies with respect to management plans which outline procedures and provide guidelines for operation and maintenance of the Railway.[239]

Throughout Volume 9 of its FEIS and as presented during the Final Hearing, Baffinland provided a number of potential accident and malfunction scenarios by major Project component, along with proposed prevention measures and a predicted risk of occurrence. A summary of these scenarios is provided as follows:

Train Collisions: Baffinland considered the risk of accidental train collisions with other trains, vehicles, humans or wildlife leading to injury or mortality was considered to be low. Baffinland indicated that safety measures would be enforced to reduce the possibility for accidents or malfunctions leading to collisions to occur, and that with control measures in place, collisions would be considered an unlikely event with a very low to low risk of occurrence.

Injury to Passing Hunters: Baffinland outlined its plans to prevent accidental injury to hunters passing near Project areas, including the establishment of community education and awareness programs and presentation of this information in local communities to advise hunters of activities in the area. Baffinland has committed, where possible, to establish alternative hunting routes and trails in consultation with the Qikiqtani Inuit Association and local Hunters and Trappers Organizations. Where such alternative routes are not possible or practical, Baffinland indicated that it would plan to develop localized exclusion zones and that it would post appropriate warning signs advising of these zones. Baffinland further noted that it is possible, though unlikely, that a Project activity may cause injuries to a passing hunter(s) and that, where such an injury may occur, the on-site emergency response team would be mobilized to assess the injury and implement response action as soon as possible, including treatment at on-site medical services or evacuation to an external medical facility. Baffinland's FEIS concluded that the risk of this occurrence would be low.

Baffinland noted during the Final Hearing that it planned to employ ship track markers in order to prevent accidents along the shipping route during the winter months:

> *In sections of track through land-fast ice, markers will be established as a caution for travellers who may be on snowmobile and use the area for hunting, travel, or other activities. Reflective highway markers will be placed along the outer edge of the ship track with a line of markers aligned approximately 500 metres clear of the actual The markers will be placed early in the winter season when the ice is safe for snowmobile travel. Weekly patrols will be carried out to ensure that the markers are operational and to observe any signs of travel or other usage in the area, and public notices will be issued to advise communities and travellers of the installation and the rule of the markers informing their general location.*[240]

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[239] F. Beaulac, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 319, lines 9-19.
[240] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 453-454, lines 19-26 and 1-10.

Ship-to-shore Fuel Transfer: During ship-to-shore fuel transfer at port sites, Baffinland's FEIS anticipated that minor accidental releases may occur occasionally in water and/or on land. It also noted that other oily discharges may occur from bilge tanks, engines, mechanical parts and other devices on board. The FEIS indicated that spills on land and ice would be more readily contained than those in open water, suggesting that snow and ice may help to contain the spill while clean-up action is implemented. Although Baffinland noted that a fuel spill would likely occur at some point during the life of the Project, it also indicated that spills resulting from the ship-to-shore transfer operation would quickly be contained and that the environmental effects resulting from such an incident would not be significant, with the risk considered to be low.

Fuel Spill from Over Wintering Fuel Vessel: During the construction phase, Baffinland indicated that it plans to employ a 20 million litre ice class fuel vessel for overwinter fuel storage at Steensby Inlet in order to provide the diesel fuel required to support construction activities. Baffinland's FEIS suggested that this practice is commonly employed for use with Projects undertaken in remote Arctic locations devoid of infrastructure and further noted that the operation of such a vessel would be regulated under the Canada Shipping Act, and that the operator would have in place a Transport Canada reviewed and approved Shipboard Oil Pollution Emergency Plan and would be ready to respond to any credible emergency scenarios that may arise aboard the vessel. Baffinland has indicated that the fuel vessel would be capable of Arctic navigation and that it would be positioned during the open water season and then, once immobilized in the ice, the vessel would undero little movement except that which may occur due to tidal upswell. Baffinland has indicated that collisions with other vessels would therefore be unlikely.

With regard to emergency response for fuel spills, Baffinland indicated during the Hearing that it planned to work with North Baffin communities and to involve community members in spill response exercises once the Project moves into the construction and operation stage.[241]

Collision with Marine Mammals: Baffinland indicated that it was highly unlikely that ships would collide with marine mammals. In its FEIS, Baffinland noted that such a collision would most likely result in death of the animal, which, although unfortunate, it noted would not threaten the survival of the species. Baffinland further noted that no reliable database is currently available which could be used to arrive at a probability estimate for this event, noting that the probability of such occurring would be highly unlikely. During the Final Hearing Baffinland committed to further examining the prevalence and activities of marine mammals along specific areas of the shipping route.[242] The possible collision of project ships with marine mammals was considered by Baffinland to be a rare event with a low risk of occurrence.

Fuel Tanker Grounding or Collision Causing Fuel Spill: In its FEIS Baffinland acknowledged that while traffic in the Arctic is predicted to increase due to climate change and variability, it also noted that a large increase would not be expected for many years to come. Baffinland further indicated that detailed bathymetry remains ongoing and as such, suggested that its defined shipping route would be designed to maximize safety for crew, vessels and cargo. As technology progresses, it suggested that it would

[241] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 332, lines 10-18.
[242] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 20, 2012, p. 1195, lines 15-18.

develop more accurate navigational aids and technologies and implement these necessary. Baffinland noted that the risk of a grounding or collision causing a fuel spill would be low for this Project as it plans to employ double hulled ice class fuel tankers.

Ice / Ship Interaction: Baffinland intends to design dedicated ore carriers with icebreaking capacity for the Project-related shipment of ore, and has noted in its FEIS that ice/ship interactions are not expected to be an issue. Furthermore, Baffinland plans to equip some of the tice management vessels to be stationed at Steensby Inlet with icebreaking capabilities and these would further be available for rescue assistance through the Foxe Basin and Hudson Strait.

Major Diesel Spill at Port or along Shipping Lane:
Baffinland noted in its FEIS that catastrophic damage could possibly occur to a tanker delivering fuel, or to the fuel storage compartment of a bulk carrier. Baffinland therefore completed a semi-quantitative risk assessment of an oil spill along the shipping lane and developed and assessed a "worst-case scenario" spill event.

Worst-Case Scenario: In order to develop a credible "worst-case scenario" for an oil spill, Baffinland's FEIS took a semi-quantitative approach to the risk assessment. Baffinland considered the pattern of anticipated shipping activities to involve appreciable quantities of fuel, either as a cargo item or as required to propel the vessel iteslf, and further considered that the most likely location of a credible worst-case spill scenario would be along the southern shipping route.

Spill Modeling: Baffinland modelled large diesel spill scenarios for both Milne Inlet and Steensby Inlet, and generic spill scenarios along the shipping lane to predict the trajectory of a diesel spill along the coast line that could be impacted by such a spill. Pathways of natural weathering process were assessed by Baffinland including: evaporation, emulsification, natural dispersion, dissolution, sedimentation and biodegradation.

Mitigation Measures: Baffinland's proposed mitigation measures to address the potential for fuel spills to occur included ensuring shippers operate in compliance with regulations and guidelines established for the transportation of fuel in Arctic waters.

Recovery Methods for Spills: During the Final Hearing, Baffinland indicated that the port site oil pollution emergency plans would contain detailed procedures for spill containment and recovery for spill of fuel on ice or snow.[243] Further, with respect to a potential spill along the shipping route which could affect waters within the Nunavik Marine Region, Baffinland noted during the Final Hearing that its proposed alignment of the shipping route would have all fuel tanker traffic routed north of Mill Island, and that the risk of a transboundary effect associated with a spill would therefore be low, as the closest distance to the Nunavik settlement boundary would then be over 40 kilometres.[244]

Canadian Coast Guard Response in the Arctic Region: In its FEIS, Baffinland committed to maintain a self-sufficient emergency response capacity to deal with all events related to its operation. Until such

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[243] F. Beaulac, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 310, lines 10-12.
[244] F. Beaulac, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 317-318, lines 25-26 and 1-9.

time as Baffinland's fleet is operational however, it noted that it would rely upon the assistance of the Canadian Coast Guard for search and rescue operations and assistance to respond to accidental events during ship transit to the port sites.

6.1.2 Views and Concerns of Interested Parties

In order to limit duplication, many comments from parties regarding the overwintering of a fuel vessel have been addressed in Section 4.11.2 of this report.

Similarly, concerns raised regarding the potential for transboundary effects of potential spills to affect harvesting rights of Inuit of Nunavik are addressed in Section 6.2.2 of this report, and discussion pertaining to the capacity of various regulators as such may pertain to response to accidents and malfunctions may be found in Section 6.4.1.

In its final written submission to the NIRB, the Qikiqtani Inuit Association suggested that Baffinland be required to post security for the overwintering of a fuel barge, and further noted the importance of involving communities in emergency response preparedness in regards to both knowledge of related equipment and preparedness to deal with emergency responses. Its submission to the Board also suggested that Baffinland be required to conduct oil spill dispersal modeling that considers a number of factors, and which provides for a revised assessment of spill impact predictions.

The Government of Nunavut (GN) indicated during its presentation, that while the likelihood of a fuel spill from the overwintered vessel was low, it did not share Baffinland's confidence in the effectiveness of the textbook methods for managing spills or oil spills under ice.[245] The GN also questioned Baffinland's plans to monitor the levels of fuel within the overwintered vessel and suggested that details regarding the response methods for oil spills on and under ice as well as a description of the effectiveness of these methods in terms of recovery and management of lost product be required. It was further requested that Baffinland provide proof that the vessel that it intends to use for the overwintering of fuel has been designed and certified for use under the conditions which it is expected to operate, and that it be required to provide copies of the vessel owners' insurance policies.

The Government of Nunavut raised additional concerns during the Final Hearing regarding the requirement for Transport Canada to review only those Shipboard Oil Pollution Emergency Plans for Canadian flagged vessels, and questioned the gap in oversight that may exist if Baffinland employs foreign flagged vessels whose shipboard emergency plans would not be required to meet Transport Canada's standards for approval.[246]

Transport Canada confirmed during the Final Hearing that the shipboard oil pollution emergency plans of foreign-flagged vessels would not be regulated by Transport Canada, but that these plans would be reviewed by the government in the country where they are registered.[247]

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[245] R. Eno, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 598, lines 9-14.
[246] P. Suvega, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 876, lines 1-4.
[247] P. Topping, TC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, p. 876, lines 9-23.

The Canadian Transportation Agency indicated in its written submission to the Board that clear directives would need to be elaborated as to when caribou presence and movement in the vicinity of the Railway would require immediate attention and possible changes to railway operations such as reduced speed or limiting train traffic should be implemented.[248] The Canadian Transportation Agency also stated that Baffinland's assertion that caribou would not travel on the Railway was not confirmed empirically and that, later in the Project life, should the caribou population have increased considerably and large herds form, the probability of collisions may be much greater. Considering this, the CTA suggested that rapidly responding to an eventual problem of collisions between trains and caribou would be very important, and that at that time, the systematic implementation of rail traffic controls would be required.

During its Final Hearing presentation, Makivik Corporation suggested that Baffinland's proposed fuel spill response capacity may not be sufficient for adequate responses, especially in ice covered periods. Makivik Corporation encouraged Baffinland to employ persons to conduct robust on-board monitoring to help avoid ship strikes with marine wildlife and suggested that Baffinland consider suspending shipping altogether during times when marine mammals are particularly sensitive to disturbance, such as periods of seal pupping and denning. It further recommended that Baffinland provide spill response capacity to all of the communities along the Hudson Strait to allow for more immediate response times in the event of a spill and requested that Baffinland be required to provide a revised emergency response and spill contingency plan which gives consideration to a spill occurring within the Hudson Strait.

In addition, Fisheries and Oceans Canada requested during the Hearing that Baffinland be required to revise its spill planning to include additional marine areas:

> *DFO is concern that modelled oil-spill trajectories in the two ports may not be applicable to areas in Hudson Strait, for example, near Mill Island where walrus concentrate. DFO recommends that, in addition to having a clear recording mechanism to identify occurrences, that additional trajectory modelling be completed for areas of Hudson Strait, such as Mill Island, where walrus concentrate, as well as for mid-Hudson Strait in the winter. This will be useful in spill prevention and planning exercises. Further, Baffinland should update their emergency response and spill contingency plan.*[249]

Concern was raised by members of the public in Pond Inlet regarding the ability of the Canadian Coast Guard to assist in the event of a spill, as it was noted that spill response has been provided within the community but as no training on the use of the equipment has been provided, communities feel unprepared to assist in responding to a spill.[250]

Community members in Pond Inlet expressed concerns regarding the safety measures that Baffinland would put into place to prevent land users from having accidents where they may come across the Railway or where they may attempt to cross the ship track:

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[248] Canadian Transportation Agency Final Written Submisssion, May 30, 2012.
[249] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 766-767, lines 16-25.
[250] A Kublu, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 28 (pm), p. 2679, lines 10-12.

…sometimes when you're out hunting and the weather becoming bad and we're travelling across the ice even though you're travelling on snowmobiles when you're trying to find out there the trail is it's almost impossible to find the trail and then you have a hard time travelling then you're a hunting and sometimes you travel for miles and you're tired and that can be a health hazard – I mean a safety hazard.[251]

I want to ask: How -- how will I be able to see flags when there's 24-hour darkness? And will there be any internet service in our community so that we can -- our hunters can know in advance when the ships are going to be passing through Steensby Inlet?[252]

The Canadian Coast Guard provided some indication of methods it had employed in southern locations to advise the public of ship movements in order to mitigate the potential for accidents to occur which involve people travelling on the ice:

…a current practice, in the south, when we'll use our icebreakers to notify the communities than an icebreaker will pass in a certain area to ensure that skidoo or fisherman that intends to go in this area avoid the sector in order to -- to not a -- be impacted. So what we do, we use the community newspapers, radio to communicate to them that an icebreaker will pass them. With regard to the Arctic, it is -- it is something that we are not used to -- to communicate, so I cannot answer on that particular part. But, yes, in the south, we have some mean to communicate, that an icebreaker will pass in a certain area.[253]

6.1.3 Views of the Board

The NIRB's EIS Guidelines required that Baffinland describe the potential for accidents and malfunctions that may occur as a result of the project development, discuss effects of these occurrences on the environment, and provide contingency plans and mitigation measures designed to address any impacts that could be expected to occur. The Board acknowledges Baffinland's thorough approach to describing a broad range of potential accidents and malfunctions, the effects of these incidents on the environment, and the assessment of options to mitigate the impacts that may occur. After considering all parties' input as provided in written submissions and at the Final Hearing, the Board is of the opinion that the Proponent has done much to assess the potential for accidents and malfunctions to occur and develop appropriate mitigation and management plans.

In many of the preceding sections of this report which address potential impacts to specific valued ecosystem or socio-economic components, the NIRB has provided recommendations meant to address concerns raised by parties, further mitigate risks and improve upon Baffinland's plans for preventing and mitigating potential accidents and malfunctions associated with the Project. However, there are several

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[251] Sam Kublu, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 28 (pm), 2012, p. 2685, lines 17-25.
[252] S. Kublu, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2523, lines 7-12.
[253] P. D'Arcy, CCG, NIRB Final Hearing File No.: 08MN053 Transcript, July 24 (am), 2012, p. 1668-1669, lines 26 and 1-12.

issues associated with potential accidents and malfunctions and parties' concerns which remain to be addressed.

Recognizing the potential for foreign governments to require much less in terms of Shipboard Oil Pollution Prevention Plans, the Board is of the opinion that any foreign flagged vessels commissioned by the Proponent for shipping within Canadian waters should be subject to Transport Canada's Marine Safety Delegated Statutory Inspection Program, as recommended in Transport Canada's final written submission.

Baffinland provided limited information during the Final Hearing with respect to mitigation measures that would be implemented should caribou interaction with the Railway prove to become an issue, namely as animals may begin to use the rail embankments as a travel corridor to escape insect harassment or snow conditions. The Board also noted that the Proponent was unable to confirm the possible use of inuksuks, flagging or other deterrents to keep wildlife away from the Railway during operations. The Board has recommended measures to be implemented in order to limit potential caribou interactions with the Railway, and to monitor the use of crossings and the Railway embankment.

Considering that no railway infrastructure has been proposed or built in Nunavut to date, the Board has concerns regarding the potential implications to the safety of Project employees and other land users. The Board has made a previous recommendation that the Proponent work with other agencies to undertake consultation regarding railway operations and safety considerations.

Furthermore, as noted in Section 5.7, the Board reiterates its understanding of Baffinland's plans to provide railway operations and maintenance buildings along the rail line for use by railway personnel as safety and emergency shelters. The Board supports this measure, but has also provided a recommendation that requires emergency shelters be placed along both the rail line and Milne Inlet Tote Road which are to be available for use by all Project employees and members of the public. These shelters are required to provide shelter in the event that Project employees or other land users become stranded due to inclement weather, equipment failure or other unforeseen circumstances.

The Board is concerned that Baffinland was unable to confirm during the Final Hearing whether or not an access road along the rail line would be constructed and maintained throughout the operation of the Railway. Based on the evidence presented, the Board is not confident that the Proponent's response to railway malfunctions or accidents would be adequate (in the event of a derailment and potential spill), nor that such a response would be made in a reasonable time period, without an access road in place during the life of mine and railway operations. This matter has been addressed in Section 5.7.4.

With regard to potential marine ship strikes, as noted in Section the Board has provided terms and conditions regarding the Proponent's use of observers onboard ore carriers and other vessels.

6.1.4 Conclusions and Recommendations of the Board

To ensure that wildlife interactions with the railway are minimized, the Board recommends the following:

1. The Proponent shall include in an updated Terrestrial Wildlife Management and Monitoring Plan, plans for increased caribou monitoring efforts including weekly winter track surveying

and summer and fall surveys undertaken on foot twice per month. These results shall be reported to the NIRB as a part of the Proponent's annual reporting requirements.

2. The Proponent shall include within its updated Terrestrial Wildlife Management and Monitoring Plan, a commitment to establish deterrents along the railway embankment at any areas where it is determined that caribou are utilizing the embankment to facilitate movement and where such movement presents a likelihood of caribou mortality to occur.

With respect to the containment of potential fuel spills in marine areas, the Board recommends:

3. The Proponent is encouraged to provide the Government of Nunavut with evidence that the vessel that it intends to use for the overwintering of fuel has been designed and certified for use under the conditions which it is expected to operate, and that it be required to provide copies of the vessel owners' insurance policies.
4. The Proponent shall employ full containment booms during all ship-to-shore and other marine-based fuel transfer events.
5. The Proponent and the Canadian Coast Guard are required to provide spill response equipment and annual training to Nunavut communities along the shipping route to potentially improve response times in the event of a spill.

A number of updates to spill and emergency response planning are required in order that the Proponent's plans reflect the concerns as expressed:

6. The Proponent shall, in coordination and consultation with the Qikiqtani Inuit Association and the Hunters and Trappers Organizations of the North Baffin communities and Coral Harbour, provide updates to its Shipping and Marine Mammals Management Plan to include adaptive management measures it proposes to take should the placement of reflective markers along the ship track in winter months not prove to be a feasible method of marking the track to ensure the safety of ice-based travelers.
7. The Proponent is required to revise its spill planning to include additional trajectory modeling for areas of Hudson Strait, such as Mill Island, where walrus concentrate, as well as for mid-Hudson Strait during winter conditions. The updated modeling shall be provided to the NIRB and to Fisheries and Oceans Canada for review at least 3 months prior shipment of bulk fuel to Steensby Inlet.

With respect to foreign flagged vessels whose emergency response planning may not be subjected to the same regulatory standards and compliance inspections as those required of Transport Canada for domestic vessels:

8. The Proponent shall enroll any foreign flagged vessels commissioned for Project-related shipping within Canadian waters into Transport Canada's Marine Safety Delegated Statutory Inspection Program.

6.2 Alternatives Analysis

Item 6.1 of the EIS Guidelines required the Proponent to provide an analysis of alternative means of carrying out the Project components as well as identifying and applying the criteria used to determine

the technical feasibility and economic viability of the alternatives to the Project (e.g. transportation, natural, social, economic and cultural environment). Reflecting the general approach to alternatives analyses in Canada, the Proponent used the following evaluation criteria to assess the alternatives included in the FEIS:

- Technical feasibility relates to the appropriateness of an alternative from an engineering or operational perspective and incorporates aspects of known performance and reliability for the Project.
- Environmentally acceptable considers the expected severity of residual effects on the environment of one alternative relative to the other.
- Social acceptability considers community acceptability or preferences in the decision making process.

Economic viability relates to the ability of the Project to achieve sufficient revenueto pay back the capital invested, pay the ongoing operating expenses, and cover the closure and reclamation costs while generating the necessary return on investment to attract the upfront capital investment needed. An option that results in negative cash flows is not an alternative.[254]

6.2.1 Summary of Key Issues

The alternatives analysis focused on the shipping and transportation aspects of the project, and reviewed the following:

- seasonal versus year round shipping;
- selection of a port site other than Steensby Inlet;
- alternative railway routing between Steensby Inlet and the Mine;
- shipping route alternatives through Foxe basin; and
- shipping route alternatives through Hudson Strait.

At the Final Hearing, the key focus of community comments and concerns was on the analysis of the alternatives to the port site at Steensby Inlet, year round shipping and shipping route alternatives in the Foxe Basin and Hudson Strait.

With respect to the port site at Steensby Inlet, as previously outlined in this report, the cultural significance of Steensby Inlet to the residents of North Baffin and Igloolik in particular and the significance of that area to marine mammal populations were major considerations underlying the analysis of alternative port sites. [255] Following a review of six possible alternatives (East Coast, Milne Inlet, West Coast, including Nanisivik, Steensby Inlet, Nuvuit and Iqaluit), the Proponent concluded on

[254] FEIS, Volume 3, at pp. 110-112, provided here as summarized in Baffinland's Presentation on Alternatives Analysis presented by Oliver Curran, Baffinland, at the FEIS Technical Meeting, May 1-3, 2012.

[255] On this basis, Fisheries and Oceans Canada continued to call for the evaluation of alternative port sites in their Written Submissions filed in advance of the Final Hearing.

the basis of technical feasibility issues (ice conditions, navigability, ability to accommodate large ore vessels) that only two alternative sites existed: Steensby Inlet and Nuvuit.

At the request of the Qikiqtani Inuit Association (QIA), the Proponent further considered Nuvuit as an alternative port site, and concluded that as the Nuvuit site would have doubled the distance of the Railway required to transport the crushed ore from the mine to the port, there were significant environmental, technical and financial impacts that together eliminated the Nuvuit site as a viable alternate site for the port. As noted by the Qikiqtani Inuit Association, despite recognized concerns, the most viable option for the port remains Steensby Inlet.[256]

With respect to seasonal versus year round shipping, seasonal shipping during only open water periods of the year would result in higher capital and operating costs (increased by 50-60%), due to the requirements to construct much larger handling and storage facilities at the port site, the addition of more ore carriers to the shipping fleet and the addition of a trans-shipment facility. On this basis, seasonal shipping was not considered to be a viable alternative to proposed year round shipping.

With respect to alternate shipping routes through the Foxe Basin, there were two routes considered, but based on harvest concentration information and community feedback provided in Igloolik and Hall Beach, the Proponent indicated that the preferred alternative is the eastern route.

With respect to the alternative shipping routes through the Hudson Strait, as noted under the discussion in section 4.12.2 under the subheading "Uncertainty in vessel routing and timing" the Proponent indicated in the FEIS that both the route south of Mill Island and the route north of Mill Island would be feasible. However, at the Final Hearing on the basis that the north route is more direct and farther from the Nunavik Marine Region, the Proponent indicated a preference for the shipping route north of Mill Island.

Although Baffinland's choice of the north route as the preferred alternative was noted by representatives from Makivik Corporation, speaking on behalf of residents of Nunavik at the Final Hearing to address: "Some of Makivik's concerns [about transboundary effects outside the Nunavut Settlement Area] would be reduced by the adjusted of the shipping route to the north of Mill Island"[257], the Board also heard the representatives of Cape Dorset identify some concern with the route going north of Mill Island:

> *...but the ship is going to be passing through quite close to Cape Dorset, but during the fall, that's exactly where we go out hunting before the ice really freezes over. That's when it's the best hunting season, but that's exactly where your ship is going to go through. I'm just wondering if you have other options or other routes that you might reconsider to move away a little bit from our community.*[258]

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[256] See the QIA, Final Written Submission for Baffinland Mary River Project, FEIS, May 30, 2012, a p. 11 and reiterated by S. Williamson Bathory, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 486.
257 G. Gilbert, Makivik Corp., Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 930, lines 1-3.
[258] Z. Ejetsiak, Cape Dorset, Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 990, lines 11-19.

In addition, as discussed in detail in Section 4.12 of this report, there is evidence that walrus populations may be affected to a greater extent by the shipping route to the north of Mill Island.

In summary, at the end of the Final Hearing, the Proponent indicated:

> *With respect to shipping, Madam Chair, there's an important issue with respect to the shipping route. The shipping route, Madam Chair, as you know, is entirely within the Nunavut settlement area. With respect to Mill Island, Baffinland has confirmed to you during the hearing that the -- that all of the fuel supply ships which travel during the open-water season, all of those would go north of Mill Island. Baffinland also confirmed that their preferred route for the ore carriers is also north of Mill Island. There is an alternative which was looked at, and the alternative route is to go south of Mill Island, and that was considered. And Baffinland has indicated that this alternative is feasible, but Baffinland wishes to emphasize that the preference is for both fuel supply ships and the ore carriers to go north of Mill Island. And as I will note when I get to this point in -- in these issues, is that going north of Mill Island keeps the ships further away from the Nunavik marine region.*[259]

6.2.2 Conclusions and Recommendations

While the Board recognizes the high level of community concern, with respect to the project requirement for year round shipping and the selection of the port site at Steensby Inlet, the Board accepts that based on the alternatives analysis provided by the Proponent and also the independent review conducted by the Qikiqtani Inuit Association with respect to the port site, that there are no technically and economically feasible alternatives to the preferred alternatives chosen by the Proponent of year round shipping and the deep sea port at Steensby Inlet.

With respect to the shipping route alternatives through Foxe Basin, the Board recognizes that the eastern route as described in the FEIS is the best alternative based on the location of harvest concentrations and community acceptability (specifically Igloolik and Hall Beach).

With respect to the shipping route alternatives through Hudson Strait, the Board does not agree that the Proponent's preferred alternative of the ore carriers shipping route proceeding north of Mill Island adequately reflects the environmental and social acceptability aspects of the alternatives analysis as set out in the FEIS and as indicated to the Board during the Final Hearing.

The commitment of the Proponent to the south route as the preferred alternative in the FEIS was clearly stated:

> In public meetings in Cape Dorset, community representatives requested Baffinland to put as much distance between its ships and the community as reasonably possible and as safety allows. The Company has modified its proposed nominal shipping route at this

[259] B. Armstrong, Baffinland, Final Hearing File No.: 08MN053 Transcript, July 28 (pm), 2012, pp. 2793-2794, lines 18-26 and 1-10.

request. While better ice conditions are found closer to the coast of Baffin Island, ships will pass to the south of Mill Island (between Mill Island and Salisbury Island) to the extent possible (Figure 3-1.1; or Option D on Figure 3-6.3). The Company has stated that ships will likely need to pass to the north of Mill Island (Option C on Figure 3-6.3) when ice conditions are very poor, to maintain safe and reliable passage.[260]

Further, the Board recognizes that regardless of the preferred routing chosen, as indicated by community representatives from Cape Dorset, the currents and ice conditions encountered during any trip may require sudden changes to the routing,[261] so keeping ships further away from the Nunavik marine region via choosing the route north of Mill Island does not eliminate the possibility of route adjustments that would result in ships travelling in closer proximity to that region.

As conceded by the Proponent, in direct questioning by the Board, for ore tankers the south shipping route around Mill Island remains a viable option:

> *So with regards to the ship route around Mill -- Mill Island, as stated in our impact statement, we have proposed two -- two routes: one to the north of Mill Island, one to the south of Mill Island. And based on community concerns, in previous consultations, we have stated that we could go to the south of Mill Island -- even though our preference is to the north, we could go to the south of Mill Island, unless ice conditions were such that it was unsafe to do so, and we would go to the north.*[262]

In the Board's view given the evidence of concern and potential for adverse impacts on walrus and on the harvesting and traditional activities of adjacent communities, Cape Dorset and Kimmirut, the Board reiterates, from Section 4.12.4, the following recommendation regarding the preferred routing around Mill Island:

1. Subject to safety considerations and the potential for conditions, as determined by the crew of transiting vessels, to result in route deviations, the Proponent shall require project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors. The proponent shall summarize all incidences of deviations from the nominal shipping route as presented in the FEIS to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.

6.3 Cumulative Effects

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[260] FEIS, Vol. 3, Section 3.6.3, p. 88.

[261] A. Nuna, Cape Dorset, Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 1046, lines 16-13.

[262] O. Curran, Baffinland, Final Hearing File No.: 08MN053 Transcript, July 23 (pm), 2012, pp. 1443-1444, lines 22-26 and 1-6.

As required by s. 7.8 of the EIS Guidelines, cumulative effects assessment for the Project was required to identify the residual effects of the Mary River Project and the potential for those effects to interact with the residual effects of other projects or activities to assess whether these interactions could result in a greater effect to a valued component (VC) of the biophysical or socio-economic environments. Following an initial screening of the potential for the Project to interact with other projects or activities and an assessment of whether those other projects or activities could have an effect on a valued component, the Proponent concluded that the following projects or activities should be included in the assessment of cumulative effects:

- Baffinland's previous exploration and bulk sampling programs;
- Baffinland's proposed monitoring programs concurrent with the Project;
- Past, current and future mineral exploration in the region, by Baffinland and others;
- Operating mines (Meadowbank mine in the Kivalliq Region and Raglan Mine in Nunavik) and reasonably foreseeable mines (Roche Bay Iron Ore Project);
- Decommissioned mines (former Nanisivik and Polaris mines);
- Induced development of other Mary River iron ore deposits;
- Marine transport/shipping;
- Nanisivik Naval Facility;
- Air transport;
- Military exercises;
- Traditional and recreational hunting, fishing and foraging;
- Communities;
- Tourism and commercial recreation activities;
- Baffinland's potential Separation Lake hydroelectric project; and
- Climate change

6.3.1 Summary of Key Issues

As outlined in the specific discussion of Valued Components throughout this report, although cumulative effects were identified as a possibility for several Valued Ecosystem Components, particularly caribou and marine mammals, the Proponent concluded that no significant cumulative effects are anticipated to result from the Project. With respect to those effects associated with the Proponent's development of additional Deposits No. 2 - 9 and the Separation Lake hydroelectric project, the Proponent correctly identified that these additional projects and activities would be required to undergo additional assessment of the potential effects of these projects and activities in conjunction with effects of the Mary River Project prior to proceeding.

- In their written submissions and over the course of the Final Hearing, the Board heard from Elders, parties and Intervenors that cumulative effects had not been fully accounted for in the FEIS: The Government of Nunavut (GN) and several community representatives indicated that the cumulative effects of in-migration and out-migration may have been underestimated.

- The Qikiqtani Inuit Association (QIA) stated that the Proponent has not adequately assessed how the impacts of Project activities may interact over time and space to have cumulative effects.
- Fisheries and Oceans Canada (DFO)[263] and Environment Canada (EC)[264] expressed the view that the cumulative effects of ballast water releases over time had not been fully considered.

Representatives from Makivik Corporation in Nunavik also indicated that the Project's potential for cumulative effects should also consider the other existing and planned developments in the area, including those activities taking place in Nunavik.

> *There are many things going on. The fact that we're working closely together with them -- we have two mining sites in Nunavik. One is called Raglan Mine, and it's in operation, and we share property share, and they've numerous exploration activities going on. They are right before us.*[265]

At the Final Hearing, community members also indicated that the unprecedented shipping associated with the Project should also be viewed in the context of receding ice making the Northwest Passage more likely to be used for international transit:

> *I had asked the government, when this -- the international shipping is becoming more prevalent, especially through the northwest passage. I -- I -- I wish it, as -- like this, that it would be used more and more, as more ships come in to the north. I don't want to -- I don't want it to be only used for northerners. I want to -- it to be used as a -- as a passage and* gateway.[266]

6.3.2 Conclusions and Recommendations

As noted in several sections of this report associated with particular Valued Ecosystem or Socio-economic Components, where uncertainty or concern with respect to the potential for cumulative effects has been noted, the Board has proposed recommended terms and conditions to specifically address those cumulative effects and such terms and conditions are outlined in that section. In addition, for some components where the cumulative effects assessment provided by Baffinland is characterized by a high level of uncertainty, the Board has employed a more stringent formulation of the precautionary approach, proposing more baseline monitoring and calling for ongoing adaptive management planning.

[263] D. Moggy, DFO, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 757, lines 1-10.
[264] S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 725-726, line 26 and lines 1-10.
[265] A. Alaku, Makivik Corporation, NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 913, lines 9-14.
[266] A. Kublu, Pond Inlet, NIRB Final Hearing File No.: 08MN053 Transcript, July 27 (pm), 2012, p. 2517, lines 16-23.

6.4 Regulatory Capacity

As noted by the Board staff during the Hearing, given the unprecedented scale of this Project Proposal and the crucial ongoing role occupied by regulatory agencies in the adaptive management approach required for the Project: "Through the course of the hearing thus far, parties have raised concerns rather consistently about the extent to which this project, should it proceed, might result in challenges to regulatory capacities."[267] For this Project Proposal concerns about regulatory capacity were identified as particularly acute in the current fiscal environment of cost-cutting at all levels of government and in light of recognized limits on regional capacity in the Arctic.

6.4.1 Summary of Key Issues

Given the critical emphasis on the contributions of regulatory agencies to the various working groups supporting the development of effective monitoring and measurement elements required for adaptive management, limitations on regulators to participate fully in these activities could impose serious limitations on the effectiveness of these mechanisms to limit mitigate project effects. As noted by the Qikiqtani Inuit Association:

> *….the capacity of government agencies is a real and significant concern to QIA, particularly in relation to the mandate, breadth, and volume of activities associated with each of the proposed working groups. While QIA is confident in its own ability to develop the requisite capacity to participate in the project, in the event government participation is either inconsistent or unavailable, it is highly likely that QIA's involvement will be required to expand to accomplish the same level of project monitoring. QIA, therefore, strongly requests that NIRB, in its final hearing report, clearly identify government capacity as a known and predictable risk to project monitoring. It is QIA's position that inadequacies in the ability to monitor project interactions will result in additional issues, particularly in the areas of cumulative effects investigations, as well as project expansion, review, and approvals.*[268]

In this regard, the NIRB is also acutely aware of the Board's own role in project monitoring established under Article 12, Part 7 of the NLCA and the associated additional resource commitments that will be necessary for the Board to meet its own obligations if the Project proceeds. If the Minister agrees that the Project can proceed, the increase in resources necessary to fund the NIRB's monitoring officers responsible to monitor compliance with the Project Certificate become the responsibility of the Federal Government pursuant to Section 12.2.31 of the NLCA.

In addition to concerns regarding regulatory capacity and commitment to participate fully in monitoring programs, there were also concerns expressed regarding the capacity of regulators to fulfill their inspection, response and enforcement mandates, particularly for those agencies with only seasonal or

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[267] R. Barry, NIRB, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 555, lines 11-15.
[268] S. Williamson Bathory, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 502-503, lines 14-26 and 1-6.

no presence in Nunavut. For example, the Canadian Coast Guard (CCG) stated the following regarding their current Arctic capacity:

> *You see a map of -- you see on the map the location of the depot sites in the Arctic. These depots are not accessible during the winter season. In summary, the Canadian Coast Guard provides services in the Arctic mainly during the navigation season from mid-June to late November. Outside these dates, limited resources are available, although emergency situations remain a priority. The commissioning of the new polar icebreaker will help supporting services in the Arctic.* [269]

It was also noted that the regulatory, ongoing inspection and enforcement mandate of some government agencies is very broad and imposes obligations on regulators over the lifetime of the Project. The Board notes that agencies such as Transport Canada, with broad regulatory, inspection and enforcement jurisdiction over "rail, marine, aviation, and shippers manufacturers"[270] will play a significant and ongoing role in ensuring the Project proceeds in compliance with applicable requirements. The Board notes that each component of the regulatory system from licensing through to enforcement is only as effective as the "weakest link", so if there is a failure to provide appropriate resources to the licensing, inspection or enforcement programs of any of the regulatory agencies, the effectiveness and credibility of the entire regulatory system can be called into question. Reflecting these concerns, the Board questioned the parties directly at the Final Hearing regarding whether they would have the capacity to fulfill their regulatory mandates if the project went ahead. All parties did provide assurances to the Board that although the parties may not have sufficient capacity at present, they would revisit their requirements and had confidence that they would be provided with sufficient resources to discharge their regulatory obligations.[271]

6.4.2 Conclusions and Recommendations

Despite the reassurances of parties that sufficient regulatory capacity will be added to the address the effects of this project, the Board continues to have serious reservations with respect to the resources, resilience and preparedness of regulatory agencies to meet the increased and ongoing obligations associated with a project of this scale. The Board recognizes that the construction period may provide a window of opportunity for all regulators, land owners and mineral owners with a mandate in relation to the Project to become prepared for their responsibilities and to ensure that gaps in regulatory capacity that could threaten the effectiveness of monitoring, mitigation and adaptive management measures are identified and addressed. Consequently, the Board recommends the following:

Despite the reassurances of parties that sufficient regulatory capacity will be added to the address the effects of this project, the Board continues to have serious reservations with respect to the resources,

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[269] P. D'Arcy, CCG, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 830, lines 16-25.

[270] H. Nikkel, TC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 866, lines 11-13.

[271] See for example, R. Aitken, AANDC, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 555, P. Suvega, GN, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 691, S. Forbrich, EC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, p. 745, P. D'Arcy, CCG, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 838-839, H. Nikkel, TC, NIRB Final Hearing File No.: 08MN053 Transcript, July 18, 2012, pp. 889-890.

resilience and preparedness of regulatory agencies to meet the increased and ongoing obligations associated with a project of this scale. The Board recognizes that the construction period may provide a window of opportunity for all regulators, land owners and mineral owners with a mandate in relation to the Project to become prepared for their responsibilities and to ensure that gaps in regulatory capacity that could threaten the effectiveness of monitoring, mitigation and adaptive management measures are identified and addressed. Consequently, the Board recommends the following:

1. Within 12 months of the issuance of the Project Certificate, all regulatory agencies with a regulatory mandate for the project, land owners and mineral owners are to conduct an internal capacity assessment to identify the monitoring, inspection, enforcement and reporting requirements for the specific regulatory agency, land owner or mineral owner that will be associated with the Project during operations, including taking into account the resource commitments necessary to participate fully in the key Project-specific Working Groups.
2. Within 24 months of the issuance of the Project Certificate, and on the basis of the internal capacity assessment, all regulatory agencies with a regulatory mandate for the project, land owners and mineral owners are to develop an implementation plan that identifies the ongoing resource commitments associated with the Project, the gaps in existing capacity and the mechanisms for ensuring there is capacity to meet the required commitments throughout the Project's lifecycle.

6.5 Operational Variability

As described in the FEIS, Volume 3, the Project Proposal is based on a nominal annual production rate of 18 million tonnes of ore and involves the mining of Deposit No. 1 only. However, the FEIS also identifies that the annual production rates will vary with factors such as market conditions, ore grades and unanticipated events, and as such the Project infrastructure is designed to accommodate annual production of 30 million tonnes of ore. This additional capacity would enable the Proponent to add production from Deposits No. 2 and 3 with only minor expansion to the proposed mining infrastructure. However, as noted by the Proponent, further assessment and regulatory approvals would be required before the Proponent could begin mining deposits other than Deposit No. 1.

In addition to the potential for the Proponent to accelerate the annual rate of production of Deposit No. 1, up to the limits of the proposed mining infrastructure (30 million tonnes), there is also the potential for the Proponent to have to reduce the annual rate of production to reflect variables such as ore prices, prolonged interruptions to shipping, malfunctions or accidents, etc.

In addition, the use of adaptive management also has the potential to impact the annual production rate:

> *MR. KADLUN: Madam Chair, what I'm getting at is that earlier you said the production will vary to some extent, I guess, whether they are lower or more than 18 million. I'd like to get a clarification on by how much that will vary? Thank you.*
>
> *MR. ANDERSON: Michael Anderson, Baffinland. I guess one of the best ways to answer that question is that we were, through the course of the review, we were asked to look at increases and decreases in tonnage and their effect, and there was a cumulative effects assessment that was done to qualify that. As we -- as there are many unknowns*

going into this project, we're -- we're -- as Erik had mentioned, we are planning on using adaptive monitoring, mitigation. And when we say vary, we may find that, with that monitoring, we may have to decrease our production levels to mitigate effects, and conversely, if we find that the effects are less, there is capacity within the system to increase production capacity as well.[272]

6.5.1 Summary of Key Issues

Due to the potential for this operational variability to alter the predicted impacts for the project, the Qikiqtani Inuit Association requested that the NIRB consider establishing a maximum nominal production rate for the project if approved to proceed:

Project scope, proposed or production rate, QIA understands the Mary River project, as presented in the final environmental impact statement, is associated with mining of ore from deposit 1 and that impact analysis predictions found within the final environmental impact statement are based on a nominal production rate of 18 million tons of iron ore per year. QIA has raised this item as a specific topic at the final hearing as QIA understands there's a strong likelihood that the project may expand beyond the currently proposed production rate. Although a robust and multi-generational project is a common goal, QIA submits that understanding the triggers for future assessment requirements are important features for future project planning. It is QIA's opinion that increases in the ore production rate above the nominal amount could result in changes to the predicted impacts, particularly for socioeconomics, terrestrial, and marine environments. Without further information QIA recommends that NIRB consider setting a maximum nominal production rate for the assessment and approval of this project. Such a nominal production rate could be established within the terms of the NIRB project certificate.[273]

In response to the QIA's request and further questions regarding the operating range, the Proponent reiterated the need for flexibility in their operations to accommodate varying production rates and associated operating capacity, as the annual production rate may be affected by a number of factors:

With respect to our operations, the Qikiqtani Inuit Association, in their written submission, has recommended, to the Nunavut Impact Review Board, an annual rate-of-production cap. Baffinland would like to reiterate our project description, as stated in our impact statement.

As indicated in the project description, the project addresses a nominal 18-million-ton-per-year production rate for mining of Deposit Number 1 only. Annual production rates

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[272] Question by P. Kadlun, Board Member, the NIRB and answer by M. Anderson, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 16, 2012, pp. 99-100, lines 14-26 and lines 1-6.

[273] S. Williamson Bathory, QIA, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp.489-490, lines 25-26 and lines 1-23.

will vary with factors, such as market conditions, ore grades, and unanticipated events. In order to ensure a nominal 18 million tons per year of iron ore, the project infrastructure are designed for a capacity of 30 million tons per year.

The company recognizes that the development of other deposits will trigger the requirement for another assessment. As stated last week and in our impact statement, it is estimated -- the train frequency is estimated to account for six loaded trains and six unloaded trains each day. The train speeds we can safely operate are expected to vary somewhat seasonally -- seasonally to accommodate permafrost and track inspection and maintenance issues. Speeds are typically slower in summer than in winter; therefore, as to variability in our estimate, we could see between four and eight loaded trains and four and eight loaded untrains [sic] each day.

For ore shipments, the impact statement estimated a-hundred-and-two ore carriers per year. Frequency or rate of shipping for ore is expected to vary seasonally, as well, with ship turnaround quicker in summer than in winter. We might see variability of a ship arriving at port every two days in the summertime, and up to every five or six days in winter. Freight and fuel delivery would occur in summer only. From this description, it is clear that operational flexibility is required for this project, especially considering its northerly and remote location.[274]

Further in the FEIS, Vol. 3, at p. 128, the Proponent notes under subheading 6.6.3 "Increased Production Rates" that although no additional infrastructure would be required to increase production from 18 million tonnes per year to 30 million tonnes per year, an increase in production rate would likely result in an increase in shipping frequency depending on the duration and magnitude of increased production rates, and that these changes to shipping frequency may require changes to the Project's Environmental, Health and Safety Management Plans.

According to Baffinland's discussion of operational flexibility and variation in the context of shipping, the FEIS indicates, and Baffinland reiterated in their Closing Statement at the Final Hearing:

> The Project has been designed so that there is an estimated 20 % operational flexibility in timing on an annual basis. This provision makes allowance for unplanned delays, e.g. in loading, offloading, vessel operations and ice conditions, while providing that delivery to market on a continuing basis can be maintained.[275]

In the FEIS, Baffinland indicated that with respect to the nominal shipping rates, "the estimated 204 transits (102 round trips) by the icebreaking ore carrier fleet to Steensby Port each year correspond to some 136 transits that will occur during the period of November through June".[276] On this basis, it is anticipated that the ore shipping rates anticipated during the period of July-October (essentially the

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[274] O. Curran, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (am), 2012, pp. 2033-2034, lines 17-26 and lines 1-22.
[275] FEIS, Vol. 3, Section 3.6.3. at p. 87 and Exhibit 66, NIRB Final Hearing File No.: 08MN053, Exhibit 66, Baffinland Iron Mines Corporation, Closing Statement, Pond Inlet, July 28, 2012, filed by Baffinland on July 28, 2012.
[276] FEIS, Vol. 3, Section 3.6.3.2 at p. 89.

“open water season”) during normal operating conditions will be 68 transits over the course of 4 months, or 17 transits per month during the open water season.

6.5.2 Conclusions and Recommendations

While the Board understands the need for operational flexibility as requested by the Proponent, given the uncertainty regarding the potential effects on marine mammals and Inuit harvesting associated with year round shipping, the Board is concerned about the changes to shipping frequency that may result from a significant increase in production for an extended period of time. As indicated in section 4.13 of this report reviewing potential effects on Marine Wildlife and Marine Habitat, in the Board’s view it is appropriate to apply a more stringent approach to the application of the precautionary principle in respect of potential effects on marine wildlife and marine habitat. As a reflection of that approach, the Board is recommending that an upper operating limit be imposed on the maximum number of ship transits annually and during the open water season. In setting this limit, the Board has taken into account Baffinland’s project description and the 20% operational flexibility associated with project shipping.

The Board also recognizes that while these limits will restrict, to some extent, the Proponent’s operational flexibility, in keeping with the adaptive management approach noted by the Proponent, if Baffinland is subsequently able to demonstrate that the effects associated with year round shipping are less than predicted and the Proponent’s operational plans require an increase to shipping beyond the limits established by the Board, the Proponent may request the Board to revisit these limits in accordance with Article 12, Section 12.8.2 of the NLCA to reconsider the terms and conditions contained in the NIRB certificate.

The Board recommends:

1. The Proponent shall not exceed 20 ore carrier transits to Steensby Port per month during the open water season and 242 transits per year in total.

6.6 Performance Bonding

Section 12.5.5(f) of the NLCA indicates that the: “NIRB shall, when reviewing any project proposal, take into account all matters that are relevant to its mandate, including the following: … (f) posting of performance bonds.” When viewed in context, this requirement requires the NIRB to consider the extent to which the Proponent has established that there are sufficient financial assurance mechanisms in place to prevent environmental degradation and preserve and protect the area’s ecosystemic integrity.

6.6.1 Summary of Key Issues

The Preliminary Mine Closure and Reclamation Plan (MC&RP), presented in the Type A Water Application[277] addresses the reclamation of all project-related activity areas and infrastructure related to the Mary River Project and provides a cost estimate for the final mine closure of approximately $520 million. In keeping with the general approach to ensuring that mine operators in Nunavut have posted sufficient reclamation security, as provided for in the Mine Site Reclamation Guidelines for the Northwest Territories, 2007,[278] the Mine Site Reclamation Policy for Nunavut, 2002,[279] the Qikiqtani Inuit Association (QIA) Abandonment and Reclamation Policy for Inuit Owned Lands,[280] and the Nunavut Waters and Nunavut Surface Rights Tribunal Act,[281] although the preliminary estimate is considered by the NIRB, reclamation liability, including an assessment of the amount is discussed in detail during the water licensing process and is typically secured by way of a condition in the water licence and land tenure instruments granted by the land owners, AANDC and the QIA.

As noted at the Final Hearing, although the Board had no indications that parties had concerns regarding the accuracy or adequacy of the proposed cost estimates, more detailed discussions on this point are to be expected in the water licensing phase:

> *MR. BARRY: ...Having -- having now reviewed Baffinland's final environmental impact statement, as well as the company's proposed plans for temporary closures, permanent closures, and site remediation, does Aboriginal Affairs and Northern Development Canada have any comments on the adequacy of the amount of reclamation liability, as calculated by Baffinland for the Mary River project?*
>
> *MR. AITKEN: I don't -- I -- we don't have a -- a clear position. We would hope to clarify our response through the water licence process, as well. But I think it's a -- we -- we could say that it's a --a -- a good start, in our opinion. But we have to define our position more clearly through the water licencing process.*[282]

In addition to financial assurance regarding reclamation liability, questions were raised regarding how financial assurance for clean up costs would be dealt with in respect of the proposed overwintering of a fuel vessel. In that regard, the Board heard from Transport Canada that under the current regulatory structure there is a requirement for the vessel to have insurance to cover pollution related impacts:

> *In the case of oil carried as cargo in tankers such as in the overwintering vessel proposed by Baffinland, the Civil Liability Convention applies. Ship owners -- ship owners are held strictly liable for oil pollution from their ships subject to a limited number of defences. In exchange, ship owners areentitled to limit their liability to a maximum dollar amount*

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[277] FEIS Volume 3, Attachment 10 to Appendix 3B, Annex B , Table 12-1 at p. 41.

[278] Department of Indian Affairs and Northern Development (INAC as it then was). 2007. Yellowknife: INAC .

[279] INAC. 2002. Ottawa: Minister of Public Works and Government Services Canada.

[280] The Qikiqtani Inuit Association, 2009. Abandonment and Reclamation Policy for Inuit Owned Lands (Draft), May 2009.

[281] Nunavut Waters and Nunavut Surface Rights Tribunal Act, S.C. 2002, c. 10, provisions relating to water user compensation and security, ss. 13, 63, 67 and 76.

[282] Question from R. Barry, NIRB and response from R. Aitken, AANDC, NIRB Final Hearing File No.: 08MN053 Transcript, July 24 (am), 2012, p. 1576, lines 15-23.

linked to the tonnage or size of the vessel. To ensure that potential victims are protected, the Civil Liability Convention requires that ship owners of tankers of more than 2,000-gross tonnage carry insurance to cover the full amount of the liability. This insurance provides for direct action by claimants against the insurer and is certified by State parties to the Civil Liability Convention, such as Canada. The maximum liability for ship owners under the Civil Liability Convention for the largest tankers is approximately $145 million per incident.[283]

The Board also heard from the Canadian Transportation Agency that with respect to the Railway the Proponent will also have to meet insurance requirements as follows:

As you've mentioned, Ryan, it involves third-party bodily injury or death. That's one of the requirements of -- of the liability insurance. Third-party property damaging, excluding damage to the cargo. And, thirdly, named perils pollution; we're thinking in terms of seepage, pollution, or contaminations.[284]

6.6.2 Conclusions and Recommendations

Having duly considered the reclamation security proposed under the auspices of the Proponent's Preliminary Mine Closure and Reclamation Plan and that will be reviewed in detail in the Nunavut Water Board water licensing process, the insurance requirements applicable to the proposed overwintering of the fuel vessel and the Railway insurance requirements, the Board does not consider it necessary to recommend the inclusion of any additional performance bonding or financial assurance mechanisms in the project certificate.

6.7 Transboundary Effects

As defined by the NIRB in the EIS Guidelines, s. 7.9 "transboundary impacts" are those effects linked directly to the activities of the Project inside the Nunavut Settlement Area (NSA) which occur across provincial, territorial, international boundaries or may occur outside of the NSA. In the EIS Guidelines, the NIRB noted that as the proposed shipping route runs through the Hudson Strait, although within the boundaries of the NSA, the potential for impacts in neighbouring jurisdictions outside of the NSA must therefore be duly considered. Consequently, the Proponent's FEIS was required to include an assessment of all significant adverse ecosystemic or socio-economic transboundary effects.

6.7.1 Summary of Key Issues

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[283] H. Nikkel, TC, NIRB Final Hearing File No.: 08MN053 Transcript, July 24 (pm), 2012, pp. 1700-1701, lines 21-26 and 1-12.
[284] L. Fortin, CTA, NIRB Final Hearing File No.: 08MN053 Transcript, July 24 (am), 2012, p. 1597, lines 10-16.

Similar to the Board's approach to cumulative effects assessment, the Board has discussed the specific transboundary issues raised with respect to particular Valued Ecosystemic Components and Valued Socio-economic Components in the discussion under that specific component. By way of summary for this section, Baffinland determined that there would not be any significant negative residual transboundary environmental effects associated with the Project.[285] However, the Proponent did nonetheless assess whether there could be transboundary effects in respect of the following VECs and VSECs:

- potential effects on population demographics associated with: migration of non-Inuit project employees and also non-Inuit seeking indirect jobs into the North Baffin; inter-community Inuit migration; out-migration from the North Baffin;
- potential effects with respect to substance abuse due to transportation of substances from outside Nunavut;
- potential effects on community infrastructure and public service due to competition for skilled workers and labour force capacity;
- potential effects on livelihood and employment with the creation of jobs and employment of residents in the local study area;
- potential effects on economic development and self-reliance due to the effects on the territorial economy;
- potential effects on contracting and business opportunities related to expanding markets for those supplying business services to the Project and also expanding markets for consumer goods and services;
- potential effects on climate change due to the Project's contribution to greenhouse gas emissions;
- potential effects on air quality due to degradation of ambient air quality and the possibility of long range transport of air contaminants;
- potential effects on migratory bird specieis due to habitat loss, impacts on bird health and mortality;
- potential effects associated with invasive species in ballast water; and
- potential effects associated with marine mammals (habitat, movement, mortality, health).

With respect to potential for transboundary effects, two key areas were the focus of comments at the Final Hearing. Firstly, the potential for year round shipping to have effects on marine mammal populations and the associated harvesting activities for Inuit harvesters in the Nunavik region:

> *Makivik believes that the proposed shipping route will have to be modified significantly due to ice conditions, tides, clearance, other marine vessels, and marine mammal avoidance. Makivik believes that, during some of and all of the project lifespan, the shipping route will enter into the NMR, the Nunavik marine region.*[286]

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[285] FEIS, Vol. 9 at p. 123.

[286] A. Alaku, Makivik Corp., NIRB Final Hearing File No.: 08MN053 Transcript, July 19, 2012, p. 916, lines 14-20.

Secondly, there were questions regarding the potential for transboundary effects associated with fuel spills:

> *MR. AITKEN: ... to state that there would be no transboundary effects on -- at this point in time, on the exercise of harvesting rights protected by the Canadian constitution, I think may be premature. The idea -- again, I'm not an expert in this area, but that's coming from a land claim or an exercise of treaty right's perspective, but I don't think the mammals with will respecting the shipping route. They might be going back and forth and being impacted by such a slick*
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> *DR. DAVIS: ... I think it's important to make the distinction of the spill -- the worst-case spill is an open water spill, because that's when they are transporting the fuel. Assuming that the 15-kilometre range is correct, then it won't be -- the oil spill won't be reaching very far into Nunavik waters, and most of the -- yeah, diesel fuel. Most of the marine mammals have vacated Hudson Strait during the summertime. The animals that are there are generally more coastal. They are not offshore, so from that point of view, we don't really think that there's much likelihood of this worst-case spill affecting hunting on the Nunavik coast.*[287]

The Proponent also indicated that the routing of fuel shipments to the north of Mill Island would limit the potential for transboundary effects associated with fuel spills:

> *The risk of a transboundary effect associated with a fuel spill is considered very unlikely and very low, because the shipping route is entirely within the Nunavut territory, and, as we have committed to, we will only haul fuel north of Milne (sic) [Mill] Island on the shipping route into Steensby, and that would be 40 kilometres away from the Nunavut -- Nunavik border.*[288]

6.7.2 Conclusions and Recommendations

In the Board's view, recognizing that uncertainty remains regarding the full extent of effects of year round shipping within the Nunavut Settlement Area, as set out in detail in Sections 4.11 and 4.12 of this report, some uncertainty regarding the potential for these effects to extend outside the Nunavut Settlement Area also exists. The Board does not agree with Baffinland that the potential for transboundary effects associated with shipping are eliminated by having the shipping route transiting primarily to the north of Mill Island, as events such as accidental fuel spills may have the potential to produce effects in the marine environment far outside the shipping lanes. As a result, the Board understands the desire of Makivik Corporation and the communities in Nunavik near the shipping lanes

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[287] Question by R. Aitken, AANDC, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, p. 341, lines 4-13, and R. Davis, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 17, 2012, pp. 341-342 , lines 21-26 and 1-7.

[288] E. Madsen, Baffinland, NIRB Final Hearing File No.: 08MN053 Transcript, July 26 (am), 2012, p. 2067, lines 1-7.

to be kept in informed regarding the shipping activities that could have an effect on the marine environment and marine mammals.

Therefore, the Board recommends:

1. The Marine Environment Working Group established for this Project shall invite a representative from Makivik Corporation to be a member of the Group.
2. Regardless of whether Makivik Corporation participates as a member of the Marine Environment Working Group, the Marine Environment Working Group will provide Makivik Corporation with regular updates regarding the Group's activities throughout the Project life cycle.
3. Baffinland shall make available to Makivik Corporation any ship route deviation reports provided to the NIRB in accordance with the terms and conditions set out in Section 4.12.4 of this report.

7. RECOMMENDATION TO THE MINISTER

After due consideration and in accordance with the process and primary objectives of the Nunavut Land Claims Agreement, the Board has determined that Baffinland Iron Mines Corporation's Mary River Project Proposal, NIRB File No.: 08MN053 should proceed in accordance with the Board's Final Hearing Report and associated recommendations.

8. RECOMMENDED PROJECT SPECIFIC TERMS AND CONDITIONS

8.1 The NIRB's Monitoring Program

As set out in Sections 12.7.1 and 12.7.2 of the NLCA the NIRB has the jurisdiction to establish a project-specific monitoring program to: measure the ecosystemic and socioeconomic effects of a project; assess whether the project is in compliance with the prescribed project terms and conditions; share information with regulatory agencies to support the enforcement of land, water or resource use approvals and agreements; and to assess the accuracy of predictions contained in the environmental impact statements. Given the Board's application of the precautionary approach to several aspects of this Project Proposal, in the Board's view project-specific monitoring will play a crucial role in addressing the uncertainty regarding project effects and enabling all parties to adapt mitigation measures on an ongoing basis to ensure the Project's negative effects are prevented or limited to the extent possible.

The role of the Board with respect to the establishment of monitoring programs is to focus the terms and conditions in relation to the Project. With respect to existing or future general regional and territorial monitoring programs that may include some of the same monitoring parameters/indicators as the project-specific monitoring program, the NLCA also directs the NIRB to avoid duplication but facilitate co-ordination and integration between the project-specific monitoring programs required by

the NIRB and more general programs such as the Nunavut General Monitoring Program.[289] Where the requirements of regional or territorial programs are more extensive or substantively different than those established through the Project Certificate, at all times the Proponent must ensure compliance with the Project Certificate terms and conditions.

In order to co-ordinate, integrate and avoid duplication with other monitoring programs, but also to ensure that the NIRB's project-specific monitoring program yields the information required to measure effects and adequately assess compliance with terms, conditions, regulatory instruments and agreements, the NIRB's monitoring program is developed after consultation with responsible authorities, the resource and land owners and the proponent following a Regulators' Meeting that typically occurs within several weeks after the Minister has issued a decision that the project can proceed to obtain regulatory authorizations and providing the Minister's direction regarding recommended terms and conditions. A short time after the Regulators' Meeting, the NIRB issues the Project Certificate, but the project-specific monitoring program, which is usually issued as an Appendix to the Project Certificate may not be issued in final form until some months after key regulatory authorizations, including land use permits, water licences, mineral leases, etc. are issued so that the monitoring program supplements and supports but does not duplicate the monitoring requirements in regulatory and land use instruments.

It is important to remember that the NIRB's monitoring program will have varying requirements over the course of the project lifecycle, and that monitoring requirements will apply from construction to eventual abandonment and reclamation. In areas were there may be a need for flexibility in relation to the terms and conditions of the Project Certificate or their application, the NIRB has endeavoured to reflect this in the associated language and/or acknowledge that objectives may be achieved through various means. In addition, in the event that the monitoring program needs to be modified to better achieve its purpose, the Board, the Proponent, the Designated Inuit Organization or other interested parties may cause the Board, under Section 12.8.2 of the NLCA to revisit the monitoring program, or any other terms and conditions in the NIRB Project Certificate.

8.1.1 Format of Recommendations

Wherever possible, the NIRB has used the following format for its recommended project-specific terms and conditions so as to provide clear direction on the intended application, objectives and reporting requirements:

Category: Identifies the relevant environmental component or project activity to which the term and condition applies. Wherever possible categories have been labelled so as to directly associate back to the Final Environmental Impact Statement and Environmental Impact Statement Guidelines for the Project.

Responsible Parties: Identifies the parties responsible for implementation of the term and condition. While this is generally the Proponent, at times other agencies have been implicated as appropriate.

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[289] See the discussion in Section 5.10.3 of the report and Sections 12.7.4 and 12.7.5 of the NLCA.

Project Phase: Identifies the phase(s) of Project development to which the term and condition is applicable. Project phase may include any one or more of the following:

- Construction – includes site preparation and staging ofmaterials and equipment
- Operations
- Temporary Closure /Care and Maintenance
- Closure and Post-Closure Monitoring

Objective: Provides a short description of the impact or effect being mitigated. Where relevant, expectiations regarding the timing for when terms and conditions will be deemed to be satisifed (i.e. sunset clause), who has discretion for determining it is satisfied has been provided.

Term or Condition: Provides specific direction on the required action or follow up. In most instances the NIRB has endeavoured to use generalized wording to allow for maximum flexibility in achieving the stated objective, however more explicit direction has been provided where deemed necessary.

Reporting Requirements: Sets out any specific reporting parameters required to measure achievement of objectives or to demonstrate compliance, as well as the required frequency of reporting.

It should be noted that, for a number of the recommended terms and conditions, some of the above parameters would be developed following discourse at a regulators' meeting and prior to issuance of the Project Certificate. In each instance the NIRB has noted where this would be the case.

8.1.2 General Provisions

The NIRB retains the ability to give additional clarification or direction on an ongoing basis through its Monitoring Officer, with respect to compliance requirements for the Project. Upon request by the Proponent or other parties, the NIRB can provide additional clarification or direction regarding implementation of Project Certificate terms and conditions.

Where the objective of a Project Certificate term or condition can be achieved through more efficient alternate means, the Proponent is encouraged to consult with the NIRB (and other parties as required) to seek acceptance of proposed alternatives.

Where not specified, the NIRB recognizes and respects the role of other licensing and permitting processes yet to be completed. The NIRB strongly encourages the coordination of monitoring and reporting requirements in order to reduce duplication.

8.2 Recommended Terms and Conditions

GENERAL TERMS AND CONDITIONS

NIRB Monitoring Responsiblities

1. The NIRB will appoint Monitoring Officers as required to monitor the Project in accordance with the purpose of a monitoring program as set out in section 12.7.2 of the Nunavut Land Claims Agreement for the full life of the Project, including closure and restoration. Subject to direction from the NIRB, the responsibilities of the NIRB Monitoring Officers will include:
    a. providing direction to the Proponent, the Terrestrial and Marine Environment Working Groups, regulatory agencies, and the Qikiqtaaluk Socio-Economic Monitoring Committee to supply NIRB with reports and information respecting the Project's operations, impacts and the implementation of mitigative measures;
    b. conducting a periodic evaluation of the monitoring program for the Project;
    c. compiling a report on the adequacy of the monitoring program and on the ecosystemic and socio-economic impacts of the Project; and
    d. where appropriate, recommending to the NIRB reconsideration of Project Certificate Terms and Conditions in accordance with section 12.8.2 of the Nunavut Land Claims Agreement.
2. The NIRB will report annually (in English and Inuktitut) on the results of its Monitoring Program for the Project.
3. The NIRB will schedule periodic updates regarding its Monitoring Program for the communities affected by the Project.
4. The NIRB Monitoring Officers will schedule periodic site inspections at the Project, coordinating with other regulatory agencies to the extent possible.

General Regulatory Requirements

5. The Proponent must obtain all required federal and territorial permits and other approvals, and shall comply with the requirements of such regulatory instruments.
6. The Proponent shall take prompt and appropriate action to remedy any occasion of non-compliance with environmental laws and regulations and/or regulatory instruments, and shall report any non-compliance as required by law immediately. A description of all instances of non- and associated follow up is to be reported annually to the NIRB.
7. The Proponent shall meet with respective licensing authorities prior to the commencement of construction to discuss the posting of adequate performance bonding. Licensing authorities are encouraged to take every measure to require that sufficient security is posted before construction begins.

Monitoring Records

8. All monitoring information collected pursuant to the Project Certificate and various regulatory requirements for the Project shall contain the following information:
    a. The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations;
    b. The date, time and place of sampling or measurement, and weather conditions;
    c. The date of analysis;
    d. The name of the person(s) who performed the analysis including any relevant accreditations;

e. A description of the analytical methods or techniques used; and

f. A discussion of the results of any analysis.

9. The Proponent shall make its monitoring results available, to the fullest extent possible, in English and Inuktitut.

10. The Proponent shall keep and maintain the records, including results, of all Project-related monitoring data and analysis for the life of the Project, including closure and post-closure monitoring.

11. The Proponent shall maintain the Final Environmental Impact Statement and the Environmental Effects Monitoring program developed for the Project, with predictions updated as new baseline data is collected.

12. The Proponent shall establish a Project-specific web portal or web page as a means of making all non-confidential monitoring and reporting information associated with the Project available to the general public. This does not limit what the Proponent may be required to submit to the NIRB or other regulatory authorities to meet reporting requirerments.

ECOSYSTEMIC TERMS AND CONDITIONS

8.2.1 Meteorology and Climate (including Climate Change)

Term and Condition No.	**1**
Category:	Meterology and Climate – Climate Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To provide feedback on the impacts that climate change might be having on the port facilities.
Term or Condition:	The Proponent shall use GPS monitoring or a similar means of monitoring at both port sites and will also use tide gauges at the Steensby Port site to monitor the relative sea levels and storm surges at these sites.
Reporting Requirements:	The Proponent shall summarize and supply these monitoring results to NIRB in the annual project report.

Term and Condition No.	**2**
Category:	Meterology and Climate – Climate Change Validation and Studies
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide feedback on the impacts that climate change might be having on the Project.
Term or Condition:	The Proponent shall provide the results of any new or revised assessments and studies done to validate and update climate change impact predictions

	for the Project and the effects of the Project on climate change in the Local Study Area and Regional Study Area as defined in The Proponent's Final Environmental Impact Statement.
Reporting Requirements:	The Proponent shall provide new or revised assessments and studies to the NIRB, the affected communities, relevant regulatory authorities, and interested parties.

Term and Condition No.	**3**
Category:	Meterology and Climate – Green House Gas Emissions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To confirm that the Proponent is exploring and implementing concrete steps to reduce greenhouse gases.
Term or Condition:	The Proponent shall provide interested parties with evidence of continued initiatives undertaken to reduce greenhouse gas emissions.
Reporting Requirements:	The Proponent shall include relevant information in the Annual Report submitted to the NIRB.

Term and Condition No.	**4**
Category:	Climate Change – Consultation on Climate
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To promote public awareness and engagement of affected groups.
Term or Condition:	The Proponent shall endeavour to include the participation of Inuit from affected communities and other communities in Nunavut when undertaking climate-change related studies and research.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**5**
Category:	Meteorology and Climate – Weather Monitoring Data
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide families of employees with up to date information.
Term or Condition:	The Proponent shall endeavour to explore and implement reasonable measures to ensure that weather-related information for the various Project sites are readily accessable to the public on a continual basis throughout the life of the Project
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**6**

Category:	Meteorology and Climate – Emissions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide feedback on the Project's emissions.
Term or Condition:	The Proponent shall provide the results of any emissions conducted to determine the level of sulphur dioxide (SO_2) emissions, nitrogen oxide (NO_X) emissions and greenhouse gases generated by the Project using fuel consumption or other relevant criteria as a basis.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

8.2.2 Air Quality

Term and Condition No.	**7**
Category:	Air Quality – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To provide feedback on the Project's emissions.
Term or Condition:	The Proponent shall update its Air Quality and Noise Abatement Management Plan to include an expanded regional study area and provide for land-based monitoring stations designed to capture operations phase ship-generated SO_2 and NO_2 emissions through Foxe Basin and along the Hudson Strait.
Reporting Requirements:	The updated plan shall be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**8**
Category:	Air Quality – Greenhouse Gas Emissions
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations.
Objective:	To provide feedback on the Project's emissions.
Term or Condition:	The Proponent shall demonstrate through monitoring of air quality at the mine site and at the Steensby Inlet Port site that SO_2 and NO_2 emissions remain within predicted levels and, where applicable, within limits established by all applicable guidelines and regulations. In cases where exceedances are manifested, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

Term and Condition No.	**9**
Category:	Air Quality – Greenhouse Gas Emissions

Responsible Parties:	The Proponent
Project Phase:	Construction and Operations.
Objective:	To provide feedback on the Project's emissions.
Term or Condition:	The Proponent shall provide calculations of greenhouse gas emissions generated by activities at the Steensby Inlet port and other Project sources including aircraft associated with the Project. Calculations shall take into consideration, fuel consumption as measured by Baffinland's purchase and use as well as the fuel use of its contractors and sub-contractors.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

Term and Condition No.	**10**
Category:	Air Quality –Dust Managemement and Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to air quality form dust dispersion.
Term or Condition:	The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items: a) Outline the specific plans for monitoring dust along the first few kilometres of the rail corridor leaving the Mary River mine site. b) Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from trains transporting along the rail route is greater than initially predicted.
Reporting Requirements:	To be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**11**
Category:	Air Quality – Incineration Management Plan
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to air quality from incineration activities.
Term or Condition:	The Proponent shall develop and implement an Incineration Management Plan that takes into consideration the recommendations provided in Environment Canada's Technical Document for Batch Waste Incineration (2010).
Reporting Requirements:	Updated Incineration Management Plan to be provided to the NIRB at least 60 days prior to the commencement of construction activities.

Term and Condition No.	**12**
Category:	Air Quality – Incineration
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to air quality from incineration activities.

Term or Condition:	Prior to commencing any incineration of on-site Project wastes, The Proponent shall conduct at least one stack test immediately following the commissioning of each temporary and permanent incinerator.
Reporting Requirements:	Stack test results to be reported to the NIRB and Environment Canada annually as required.

8.2.3 Noise and Vibration

Term and Condition No.	**13**
Category:	Noise and Vibration-Use of Exposives
Responsible Parties:	The Proponent, Fisheries and Oceans Canada
Project Phase:	Construction
Objective:	To determine appropriate protection of fish and aquatic life in the Arctic.
Term or Condition:	The Proponent is encouraged to work with Fisheries and Oceans Canada at the regulatory phase and to take a precautionary approach when selecting the overpressure threshold to be applied to explosives use for the protection of fish and aquatic life.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**14**
Category:	Noise and Vibration- Noise and Vibration Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate noise and vibration at Project sites, especially living areas.
Term or Condition:	The Proponent shall conduct noise and vibration monitoring at Project accommodations sites located at the Mary River mine site, Steensby Inlet Port site, and Milne Inlet Port site. Sampling shall be undertaken during the summer and winter months during all phases of Project development.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

Term and Condition No.	**15**
Category:	Noise and Vibration- Noise and Vibration Monitoring
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, local Hamlet organizations
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enhance public safety when travelling around the Project area.
Term or Condition:	The Proponent shall collaborate to the extent possible with the Qikiqtani Inuit Association and local Hamlet organizations when undertaking consultation with all affected communities regarding railway operations. During these consultations, it is recommended that the Proponent provide information including video, audio, and photographic representation as well

	as any other aids (i.e. models) that may enhance the general public's understanding of railway operations, as well as all safety considerations for members of the public who may be travelling around the project area.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

8.2.4 Hydrology and Hydrogeology

Term and Condition No.	**16**
Category:	Hydrology and Hydrogeolgy – Water Infrastructure
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To provide assurance that the potential impacts to flow and quantity of water in the Project area are minimized.
Term or Condition:	The Proponent shall ensure that the water related infrastructure or facilities that are designed and constructed, including the modification of culverts, diversion of watercourses, and diversion of runoff into watercourses along the railway, access roads, the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied advance of constructing those facilities.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**17**
Category:	Hydrology and Hydrogeology – Effluent Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to water bodies from effluent.
Term or Condition:	The Proponent shall develop and implement effectives measures to ensure that effluent from project-related facilities and/or activities, including sewage treatment plants, ore stockpiles, and mine pit, satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**18**
Category:	Hydrology and Hydrogeology – Pit Lake Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enhance predictions for mine site closure conditions.
Term or Condition:	The Proponent shall carry out continued analyses over time to confirm and

	update, accordingly, the approximate fill time for the mine pit lake identified in the FEIS.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**19**
Category:	Hydrology and Hydrogeology – Water Infrastructure Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to natural water flow.
Term or Condition:	The Proponent shall ensure that it develops and implement adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, the Proponent shall monitor, document and report the withdrawal rates for water removed and utilized for all domestic and industrial purposes.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

8.2.5 Groundwater/Surface Waters

Term and Condition No.	**20**
Category:	Groundwater/Surface Waters - Explosives
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the areas surrounding the Project.
Term or Condition:	The Proponent shall monitor the effects of explosives residue and related by-products from project-related blasting activities as well as develop and implement effective preventative and mitigation measures, including treatment, if necessary, to ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the Project and surrounding areas.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**21**
Category:	Groundwater/Surface Waters – Aquatic Effects Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate potential impacts to surface and ground waters.

Term or Condition:	The Proponent shall ensure that the scope of the Aquatic Effects Monitoring Plan (AEMP) includes, at a minimum, monitoring of non-point sources of discharge, selection of appropriate reference sites, measures to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**22**
Category:	Groundwater/Surface Waters – Sediment and Erosion Management Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To develop appropriate sediment and erosion controls to prevent impacts to surface waters.
Term or Condition:	The Proponent shall develop a detailed Sediment and Erosion Management Plan to prevent and/or mitigate sediment loading into surface water within the Project area.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**23**
Category:	Groundwater/Surface Waters – Groundwater Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to groundwater quality.
Term or Condition:	The Proponent shall develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and mitigate the potential effects of the Project on groundwater within the Project area.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**24**
Category:	Groundwater/Surface Waters – Effluent Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to groundwater and surface waters from effluent discharge.
Term or Condition:	The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carryout treatment if necessary to ensure that discharge conditions are met at all times.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

8.2.6 Landforms, Geology and Geomorphology, Soils and Permafrost

Term and Condition No.	25
Category:	Landforms – Additional Geotechnical Investigations
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to sensitive landforms.
Term or Condition:	The Proponent shall undertake the additional geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure and develop mitigation and monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	26
Category:	Landforms and Soils – Erosion Management Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To develop appropriate measures for preventing destabilization and erosion.
Term or Condition:	The Proponent shall develop and implement a comprehensive erosion management plan to prevent or minimize the effects of destabilization and erosion that may occur due to the Project's construction and operation.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	27
Category:	Landforms, Geology and Geomorphology – Natural Aesthitics
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to natural aesthetics.
Term or Condition:	The Proponent shall include within its public consultation report information related to the sentiments expressed by affected communities about the impacts that changes to the topography and landscape have had on the aesthetic value of the Project area.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	28
Category:	Landforms, Geology and Geomorphology – Permafrost
Responsible Parties:	The Proponent

Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure that permafrost integrity is maintained.
Term or Condition:	The Proponent shall monitor the effects of the Project on the permafrost along the railway and all other Project affected areas and must implement effective preventative measures to ensure that the integrity of the permafrost is maintained.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**29**
Category:	Landforms, Geology and Geomorphology – Design Plans
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To confirm constructed components meet design as assessed.
Term or Condition:	The Proponent shall provide to the respective regulatory authorities, for review and acceptance, for-construction engineering design and drawings, specifications and engineering analysis to support design in advance for constructing those facilities. Once project facilities are constructed, the Proponent shall provide copies of the as-built drawings and design to the appropriate regulatory authorities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**30**
Category:	Landforms, Geology and Geomorphology – Quarries
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide oversight on quarry design and management.
Term or Condition:	The Proponent shall develop site-specific quarry operation and management plans in advance of the development of any potential quarry site or borrow pit.
Reporting Requirements:	Plans to be provided to the NIRB for review and comment at least 30 days prior to commencement of construction activities.

8.2.7 Vegetation

Term and Condition No.	**31**
Category:	Vegetation – Construction and Operations
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To minimize impacts to vegetation.
Term or Condition:	The Proponent shall ensure that Project activities are planned and

	conducted in such a way as to minimize the Project footprint.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**32**
Category:	Vegetation – Construction and Operations
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent introdcution of invasive species.
Term or Condition:	The Proponent shall ensure that equipment and supplies brought to the Project sites are clean and free of soils that could contain plant seeds not naturally occurring in the area. Vehicle tires and treads in particular must be inspected prior to initial use in Project areas.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**33**
Category:	Vegetation - Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To facilitate monitoring.
Term or Condition:	The Proponent shall include relevant Monitoring and Management Plans within its Environmental Management System, Terrestrial Environment Management and Monitoring Plan (TEMMP).
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB .

Term and Condition No.	**34**
Category:	Vegetation - Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To determine baseline metal levels of soils used by berry-producing plants.
Term or Condition:	The Proponent shall conduct soil sampling to determine metal levels of soils in areas with berry-producing plants near any of the potential development areas, prior to commencing operations.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**35**
Category:	Vegetation - Monitoring
Responsible Parties:	The Proponent, local Hunters and Trappers Organizations
Project Phase:	Construction, Operations
Objective:	To determine baseline metal levels in foraging caribou.
Term or Condition:	The Proponent shall undertake monitoring of baseline metal levels in organ

	tissue from caribou harvested within the local study area, prior to commencing operations. The proponent is strongly encouraged to coordinate with local Hunters and Trappers Organizations regarding procurement of harvested caribou organs.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**36**
Category:	Vegetation – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To monitor for project-induced effects to foraging caribou.
Term or Condition:	The Proponent shall establish an on-going monitoring program for vegetation species used as caribou forage (such as lichens) near Project development areas, prior to commencing operations.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB .

Term and Condition No.	**37**
Category:	Vegetation - Monitoring
Responsible Parties:	The Proponent, Government of Nunavut department of Environment
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent establishment of invasive species
Term or Condition:	The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. Any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.
Term and Condition No.	**38**
Category:	Vegetation – Adaptive Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to vegetation abundance, diversity and health.
Term or Condition:	The Proponent shall review, on an annual basis, all monitoring information and the vegetation mitigation and management plans developed under its Environmental Management System, Terrestrial Environment and Monitoring Plan (TEMMP) and adjust such plans as may be required to effectively prevent or reduce the potential for significant adverse project effects on vegetation abundance, diversity and health.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB .

Term and Condition No.	**39**

Category:	Vegetation – Reclamation and Revegetation
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent erosion and promote progressive revegetation of disturbed areas.
Term or Condition:	The Proponent shall develop a progressive revegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test plots, reseeding and replanting of native plants as necessary. It is further recommended that this program be directly associated with the management plans for erosion control established for the Project.
Reporting Requirements:	To be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**40**
Category:	Vegetation – Reclamation and Revegetation
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent erosion and promote progressive re-vegetation of disturbed areas.
Term or Condition:	The Proponent shall include revegetation strategies in its Site Reclamation Plan that support progressive reclamation and that promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

8.2.8 Freshwater Aquatic Environment including Biota and Habitat

Term and Condition No.	**41**
Category:	Freshwater Aquatic Environment – Setbacks
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts of runoff into freshwater aquatic habitat.
Term or Condition:	The Proponent shall maintain a minimum 100-metre naturally-vegetated buffer between the high-water mark of any fish-bearing water bodies and any permanent infrastructure.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**42**

Category:	Freshwater Aquatic Environment – Setbacks
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts of runoff into freshwater aquatic habitat.
Term or Condition:	The Proponent shall maintain minimum a 30-metre naturally-vegetated buffer between the mining operation and adjacent water bodies.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**43**
Category:	Freshwater Aquatic Environment – Drainage
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts of runoff into freshwater aquatic habitat.
Term or Condition:	Prior to the start of construction, the Proponent must submit a Site Drainage and Silt Control Plan to the appropriate regulatory authorities for approval.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**44**
Category:	Freshwater Aquatic Environment – Explosives
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts of explosives on freshwater aquatic habitat.
Term or Condition:	The Proponent shall meet or exceed the guidelines set by Fisheries and Oceans Canada for blasting thresholds and implement practical and effective measures to ensure that residue and by-products of blasting do not negatively affect fish and fish habitat.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**45**
Category:	Freshwater Aquatic Environment – General
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to freshwater aquatic habitat.
Term or Condition:	The Proponent shall adhere to the No-Net-Loss principle at all phases of the project to prevent or mitigate direct or indirect fish and fish habitat losses.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**46**

Category:	Freshwater Aquatic Environment – Drainage
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to freshwater aquatic habitat.
Term or Condition:	The Proponent shall ensure that runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities responsible for generating liquid effluent and runoff meet discharge requirements.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**47**
Category:	Freshwater Aquatic Environment – Watercourses
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent blockages or restrictions to fish passage.
Term or Condition:	The Proponent shall ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and limit the movement of water in fish bearing streams and rivers.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**48**
Category:	Freshwater Aquatic Environment – Explosives
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Fisheries and Oceans Canada
Project Phase:	Construction, Operations
Objective:	To mitigate impacts to freshwater aquatic habitat.
Term or Condition:	The Proponent shall engage with Fisheries and Oceans Canada and the Qikiqtani Inuit Association in exploring possible Project specific thresholds for blasting that would exceed the requirements of Fisheries and Oceans Canada's *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters* (D.G. Wright and G.E. Hopky, 1998).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

8.2.9 Terrestrial Wildlife and Habitat

Term and Condition No.	**49**
Category:	Terrestrial Wildlife and Wildlife Habitat – Terrestrial Environment Working Group
Responsible Parties:	The Proponent, the Qikiqtani Inuit Association, the Government of Nunavut, Environment Canada, and any other agencies or interested parties as determined by the members to be appropriate
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance,

	Closure and Post-Closure Monitoring
Objective:	The TEWG will provide direction and guidance to the Proponent regarding: adding to baseline information during construction and before project operations commence; monitoring and reporting regarding effects occurring during operations; and providing advice regarding changes that may be required to make sure the management of negative impacts is effective and that lasting damage is prevented.
Term or Condition:	The Proponent shall establish a Terrestrial Environment Working Group ("TEWG") which will act as an advisory group in connection with mitigation measures for the protection of the terrestrial environment and in connection with it's Environmental Effects Monitoring Program, as it pertains to the terrestrial environment. Members may consider the draft terms of reference for the TEWG filed in the Final Hearing, but they are not bound by them. The role of the TEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**50**
Category:	Terrestrial Wildlife and Habitat - General
Responsible Parties:	The Proponent and other Parties as appropriate
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure appropriate and responsive adaptive management.
Term or Condition:	The Proponent shall continue to develop and implement Project-specific monitoring for the terrestrial environment, and will demonstrate appropriate refinements to design, incorporation of analytical methods and elaboration of methodologies. The monitoring plan shall contain clear thresholds to allow for the assessment of long-term trends and cumulative effects where project interactions are identified. Coordination and cooperation will be required where data collection, analysis and interpretation, or responsibility for mitigation and management requires the efforts of multiple parties (e.g., government, Qikiqtani Inuit Association, communities).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**51**
Category:	Terrestrial Wildlife and Habitat - General
Responsible Parties:	The Proponent and/or TWEG
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To promote coordination of monitoring efforts.
Term or Condition:	The Proponent, either directly or as part of the TEWG, shall consider and, where appropriate, cooperate with relevant regional and/or community-based monitoring initiatives that raise issues or produce information

	pertinent to mitigating project-induced impacts.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**52**
Category:	Terrestrial Wildlife and Habitat - Caribou
Responsible Parties:	The Proponent, TEWG
Project Phase:	Construction
Objective:	To ensure best practices are used for caribou protection.
Term or Condition:	Within 3 months of issuance of the Project Certificate, the Proponent shall initiate design, and develop the timeline to test and implement means of deterring caribou from pits and other hazardous areas. A review of best practices and techniques will be undertaken at other Northern mines where interactions with caribou occur. Considerations should include temporary ribbon placement, inuksuks, or fencing and subsequent monitoring for effectiveness. These activities shall be reported back to the Terrestrial Environment Working Group.
Reporting Requirements:	To be developed following approval of the Project by the Minister; results to be reported back to the Terrestrial Environment Working Group.

Term and Condition No.	**53**
Category:	Terrestrial Wildlife and Habitat - Caribou
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to caribou from Project-related traffic.
Term or Condition:	The Proponent shall demonstrate consideration for the following: a. Steps taken to prevent caribou mortality and injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads. b. Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times. c. Evaluation of the effectiveness of proposed caribou crossings over the railway, Milne Inlet tote road and access roads as well as the appropriate number. d. Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded. e. Protocols for documentation and reporting of all caribou collisions and mortalities, as well as mechanisms for adaptive management responses designed to prevent further such interactions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**54**

Category:	Terrestrial Wildlife and Habitat - Caribou
Responsible Parties:	The Proponent
Project Phase:	Construction – within six (6) months of issuance of Project Certificate
Objective:	To Update the Terrestrial Environmental Managment and Monitoring Plan
Term or Condition:	The Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include, but not be limited to the following: g. Details of the methods and rationale for conducting monitoring prior to the commencement of construction; h. Monitoring for caribou presence and behavior during railway construction; i. Description and justification of statistical design or other means of determining effect and proposed analyses to support the conclusions drawn from monitoring impacts of the mine and related infrastructure on wildlife; j. Details of monitoring and mitigation activities, including: i. Dust fall (fugitive and Total Suspended Particulates), that addresses methods to reduce risk to caribou forage from dust fall; ii. Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway. Using the result of this information, an early warning system for caribou on the railway shall be developed for operation. k. Details of monitoring thresholds related to level of mitigation and management; l. Details of a comprehensive hunter harvest survey to determine the effect on caribou populations and potential effect on caribou behaviour resulting from increased human access caused by upgrades to the Milne Inlet tote road (and any other roads if they are shifted from private to public use) and increase local knowledge of the mine site, including establishing pre-construction baseline harvesting data.
Reporting Requirements:	Plan to be submitted to the NIRB and the TEWG within 6 months of issuance of a Project Certificate.

Term and Condition No.	**55**
Category:	Terrestrial Wildlife and Habitat - Wolves
Responsible Parties:	The Proponent, Government of Nunavut Department of Environment
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate potential impacts to wolves.
Term or Condition:	The Proponent shall develop an adaptive management plan applicable to wolves and wolf habitat in collaboration with the Government of Nunavut-Department of Environment (GN-DOE) to ensure compliance with the

	Nunavut Wildlife Act. Consideration must be given to the following: e. monitoring for active wolf dens within a 10 km radius from the mine site, under the direction and prior approval of the GN DOE, and reporting the results through NIRB's Annual Reports on terrestrial wildlife in the Potential Development Area (PDA); f. estimating the available (glacio-fluvial materials) esker habitat within the Regional Study Area/PDA and identifying such habitat as ecologically sensitive g. developing "wolf indices" for presence/abundance of wolves (by conducting studies) to set a baseline pre-construction baseline; h. ensuring that wolf monitoring is capable of determining the relative abundance and distribution of wolves in the Project Development Area over time
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**56**
Category:	Terrestrial Wildlife and Habitat – Wildlife Habitat
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure progressive reclamation of disturbed wildlife habitat.
Term or Condition:	The Proponent shall develop a strategy for the recovery of terrestrial wildlife habitat in a progressive manner that is consistent with the *Nunavut Wildlife Act*. Overall, this will require the integration of a decision-making process and the identification of mitigation responses to cumulative impacts on caribou survival, breeding propensity, and population dynamics.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**57**
Category:	Terrestrial Wildlife and Habitat - Reporting
Responsible Parties:	The Proponent
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate and monitor for impacts to wildlife.
Term or Condition:	The Proponent shall report annually regarding its terrestrial environment monitoring efforts, with inclusion of the following information: a. Description of all updates to terrestrial ecosystem baseline data; b. A description of the involvement of Inuit in the monitoring program; c. An explanation of the annual results relative to the scale of the natural variability of Valued Ecosystem Components in the region, as described in the baseline report; d. A detailed presentation and analysis of the distribution relative to mine structures and activities for caribou and other terrestrial mammals observed during the surveys and incidental sightings; e. Results of the annual monitoring program, including field

	methodologies and statistical approaches used to support conclusions drawn; f. A summary of the chronology and level of mine activities (such as vehicle frequency and type); g. An assessment and presentation of annual environmental conditions including timing of snowmelt, green-up, as well as standard weather summaries; and, h. A discussion of any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

Term and Condition No.	**58**
Category:	Terrestrial Wildlife and Habitat - Reporting
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate and monitor for impacts to wildlife.
Term or Condition:	Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes: a. An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting; b. A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway; c. A description of the extent of dust fall based on measured levels of dust fall (fugitive and finer particles such as TSP) on lichens and blueberries, and ash content of caribou fecal pellets; d. A demonstration and description of how the monitoring results contribute to cumulative effects of the project; e. Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program; f. Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the Qikiqtani Inuit Association and affected communities, and shall be circulated as new information becomes available.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

Term and Condition No.	**59**
Category:	Terrestrial Wildlife and Habitat – Aircraft Disturbances

Responsible Parties:	The Proponent
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate aircraft disturbance to wildlife.
Term or Condition:	The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point to point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise prescribed by the Working Group) and use flight corridors to avoid areas of significant wildlife importance.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**60**
Category:	Terrestrial Wildlife and Habitat – Explosives
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to wildlife from explosives.
Term or Condition:	Prior to construction, the Proponent shall develop a detailed blasting program to minimize the effects of blasting on terrestrial wildlife that includes, but is not limited to the restriction of blasting when migrating caribou, sensitive local carnivores or birds may be negatively affected.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**61**
Category:	Terrestrial Wildlife and Habitat – Operations (General)
Responsible Parties:	The Proponent, TEWG
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate Project impacts to wildlife.
Term or Condition:	Whenever practical and not causing a human safety issue, a stop work policy shall be implemented when wildlife in the area may be endangered by the work being carried out. An operational definition of 'endangered' shall be provided by the Terrestrial Environment Working Group.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**62**
Category:	Terrestrial Wildlife and Habitat – Operations (General)
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent increased harvesting pressure on wildlife.
Term or Condition:	The Proponent shall prohibit project employees from transporting firearms

	to site and from operating firearms in project areas for the purpose of wildlife harvesting.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**63**
Category:	Terrestrial Wildlife and Habitat – Public Engagement
Responsible Parties:	The Proponent, local Hunters and Trappers Organizations
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To keep communities up to date with Project operations.
Term or Condition:	The Proponent shall liaise with local Hunters and Trappers Organizations in advance of carrying out terrestrial wildlife surveys. At a minimum, The Proponent shall also meet annually in person with Hunters and Trappers Organizations to discuss wildlife monitoring and mitigation plans and address community concerns regarding wildlife interactions. The Proponent may be required to facilitate these meetings through payment of honoraria and meeting costs.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**64**
Category:	Terrestrial Wildlife and Habitat – Waste Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent human-carnivore interactions.
Term or Condition:	The Proponent shall ensure that its Environment Protection Plan incorporates waste management provisions to prevent carnivores from being attracted to the Project site(s). Consideration must be given to the following measures: a. installation of an incinerator beside the kitchen that will help to keep the food waste management process simple and will minimize the opportunity for human error (i.e. storage of garbage outside, hauling in a truck (odours remain in truck), hauling some distance to a landfill site, incomplete combustion at landfill, fencing of landfill, etc.) b. installation of solid carnivore-proof skirting on all kitchen and accommodation buildings (i.e., heavy-duty steel mesh that would drop down from the edge of the buildings/trailers and buried about a half meter into the ground to prevent animals from digging under the skirting).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

8.2.10 Birds

Term and Condition No.	65
Category:	Birds - Awareness
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent disturbance to birds and bird habitat.
Term or Condition:	The Proponent shall ensure all employees working at project sites receive awareness training regarding the importance of avoiding known nests and nesting areas and large concentrations of foraging and moulting birds.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	66
Category:	Birds – Species at Risk
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to sensitive bird species.
Term or Condition:	If Species at Risk or their nests and eggs are encountered during Project activities or monitoring programs, the primary mitigation measure must be avoidance. The Proponent shall establish clear zones of avoidance on the basis of the species-specific nest setback distances outlined in the Terrestrial Environment Management and Monitoring Plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	67
Category:	Birds – Species at Risk
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to sensitive bird species.
Term or Condition:	The Proponent shall ensure that the mitigation and monitoring strategies developed for Species at Risk are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans and management plans that may become available during the duration of the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	68
Category:	Birds – Project Infrastructure
Responsible Parties:	The Proponent

Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent potential injuries to birds.
Term or Condition:	The Proponent shall ensure flashing red, red strobe or white strobe lights and guy-wire deterrents are used on communications towers established for the Project. Consideration should also be given to reducing lighting when possible in areas where it may serve as an attractant to birds or other wildlife.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**69**
Category:	Birds – Construction/Clearing Activities
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent nesting by birds in active Project areas.
Term or Condition:	Prior to bird migrations and commencement of nesting, the Proponent shall identify and install nesting deterrents (e.g. flagging) to discourage birds from nesting in areas likely to be disturbed by construction/clearing activities taking place during the nesting season.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**70**
Category:	Birds – Construction/Clearing Activities
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to birds and nesting areas.
Term or Condition:	The Proponent shall protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in its Terrestrial Environment Mitigation and Monitoring Plan, until the young have fledged. If it is determined that observance of these setbacks is not feasible, the Proponent will develop nest-specific guidelines and procedures to ensure bird's nests and their young are protected.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**71**
Category:	Birds – Flight Altitude Requirements
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate aircraft disturbance to birds.
Term or Condition:	Subject to safety requirements, the Proponent shall require all project related aircraft to maintain a cruising altitude of at least:

	a. 650 m during point to point travel when in areas likely to have migratory birds b. 1100 m vertical and 1500 m horizontal distance from observed concentrations of migratory birds c. 1100 m over the area identified as a key site for moulting snow geese during the moulting period (July-August), and if maintaining this altitude is not possible, maintain a lateral distance of at least at least 1500 m from the boundary of this site.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**72**
Category:	Birds – Flight Altitute Requirements
Responsible Parties:	The Proponent, Transport Canada
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate aircraft disturbance to birds.
Term or Condition:	The Proponent shall ensure that pilots are informed of minimum cruising altitude guidelines and that a daily log or record of flight paths and cruising altitudes of aircraft within all Project Areas is maintained and made available for regulatory authorities such as Transport Canada to monitor adherence and to follow up on complaints.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**73**
Category:	Birds – Monitoring
Responsible Parties:	The Proponent, Qikiqtani Inuit Organization, TEWG, MEWG
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To develop appropriate mitigation and monitoring of impacts to birds.
Term or Condition:	The Proponent shall develop detailed and robust mitigation and monitoring plans for migratory birds, reflecting input from relevant agencies, the Qikiqtani Inuit Organization and communities as part of the Terrestrial Environment Working Group and to the extent applicable the Marine Environment Working Group.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**74**
Category:	Birds – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To develop appropriate mitigation and monitoring of impacts to birds.
Term or Condition:	The Proponent shall continue to develop and update relevant monitoring and management plans for migratory birds under the Proponent's

	Environmental Management System, Terrestrial Environment Mitigation and Monitoring Plan prior to construction. The key indicators for follow up monitoring under this plan will include: peregrine falcon, gyrfalcon, common and king eider, red knot, seabird migration and wintering, and songbird and shorebird diversity.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**75**
Category:	Birds - Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assess the extent of terrestrial habiatat loss.
Term or Condition:	The Proponent's monitoring program shall assess and report, on annual basis, the extent of terrestrial habitat loss due to the project to verify impact predictions and provide updated estimates of the total project footprint.
Reporting Requirements:	To be provided within the Annual Report to the NIRB.

8.2.11 Marine Environment, Marine Water/Ice and Sediment Quality

Term and Condition No.	**76**
Category:	Marine Environment – General
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate potential impacts to the marine environment.
Term or Condition:	The Proponent shall develop a comprehensive Environmental Effects Monitoring Program to address concerns and indentify potential impacts of the Project on the marine environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**77**
Category:	Marine Environment – Working Group
Responsible Parties:	The Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and interested parties.
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	The MEWG will consult with, and provide advice and recommendations to the Proponent in connection with mitigation measures for the protection of the marine environment, monitoring of effects on the marine environment and the consideration of adaptive management plans. The role of the

	MEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.
Term or Condition:	A Marine Environment Working Group ("MEWG") shall be established to serve as an advisory group in connection with mitigation measures for the protection of the marine environment, and in connection with the Project Environmental Effects Monitoring program, as it pertains to the marine environment. Membership on the MEWG will include the Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and other agencies or interested parties as determined to be appropriate by these key members. Makivik Corporation shall also be entitled to membership on the MEWG at its election. The MEWG members may consider the draft terms of reference for the MEWG filed in the Final Hearing, but they are not bound by them.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**78**
Category:	Marine Environment – Ice Breaking and Shipping
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To obtain accurate and current ice information.
Term or Condition:	The Proponent shall update the baseline information for landfast ice using a long-term dataset (28 years), and with information on inter-annual variation. The analysis for pack and landfast ice shall be updated annually using annual sea ice data (floe size, cover, concentration) and synthesized and reported in the most appropriate management plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**79**
Category:	Marine Environment – Ice Breaking and Shipping
Responsible Parties:	The Proponent, Canadian Hydrographic Services
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assist in the development of nautical charts for Canadian waters.
Term or Condition:	The Proponent shall provide the Canadian Hydrographic Services with bathymetric data and other relevant information collected in support of Project shipping where possible, to assist in the development of nautical charts for Canadian waters.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**80**
Category:	Marine Environment – Ice Breaking and Shipping
Responsible Parties:	The Proponent, Canadian Hydrographic Services
Project Phase:	Construction
Objective:	To identify areas of risk along the shipping route.

Term or Condition:	Prior to commercial shipping of iron ore, the Proponent shall conduct a detailed risk assessment for Project-related shipping accidents, noting areas along the ship tracks where vessels may be particularly vulnerable to environmental conditions such as sea ice, and any seasonal differences in risk. This assessment shall inform mitigation and adaptive management plans.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**81**
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate potential shoreline effects from shipping.
Term or Condition:	The Proponent shall reassess the potential for ship wake impacts to cause coastal change following any further changes to the proposed shipping routes.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**82**
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To mitigate potential shoreline effects from shipping.
Term or Condition:	The Proponent is strongly encouraged to have its ore carriers subjected to sea trials to measure wake characteristics at various vessel speeds and distances from the vessel.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**83**
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To monitor relative sea level and storm surges.
Term or Condition:	The Proponent shall install tidal gauges at the Steensby Inlet Port site to monitor relative sea level and storm surges.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**84**
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To prevent sediment redistribution along the shipping route.
Term or Condition:	The Proponent shall update its sediment redistribution modeling once ship design has been completed and sampling should be undertaken to validate

	the model and to inform sampling sites and the monitoring plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**85**
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To prevent sediment redistribution along the shipping route.
Term or Condition:	The Proponent shall develop a monitoring plan to verify its impact predictions associated with sediment redistribution resulting from propeller wash in shallow water locations along the shipping route. If monitoring detects negative impacts from sediment redistribution, additional mitigation measures will need to be developed and implemented.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**86**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To update ballast water discharge impact predictions.
Term or Condition:	Prior to commercial shipping of iron ore, the Proponent shall use more detailed bathymetry collected from Steensby Inlet to model the anticipated ballast water discharges from ore carriers. The results from this modeling shall be used to update ballast water discharge impact predictions and should account for density dependent flow and annual timescales over the project life. Additional sampling should also be undertaken to validate the model and to inform sampling sites and the monitoring plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**87**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent invasive species introductions resulting from Project shipping.
Term or Condition:	The Proponent shall develop a detailed monitoring program at a number of sites over the long term to evaluate changes to marine habitat and organisms and to monitor for non-native introductions resulting from Project-related shipping. This program needs to be able to detect changes that may have biological consequences and should be initiated several years prior to any ballast water discharge into Steensby Inlet to collect sufficient baseline data and should continue over the life of the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**88**

Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent invasive species introductions resulting from Project shipping.
Term or Condition:	Prior to commercial shipping of iron ore and in conjunction with the Marine Environment Working Group, the Proponent shall complete a risk analysis regarding ballast water discharge to assess the adequacy of treatment and implications on the receiving environment. This risk analysis shall consider, but not be limited to: f. Invasive species; g. Seasonal oceanography; h. Ballast water quality and quantity; i. Receiving water quality; j. Residual physical, chemical, and/or biological effects.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**89**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine water quality resulting from ballast water exchange.
Term or Condition:	The Proponent shall develop and implement an effective ballast water management program that may include the treatment and monitoring of ballast water discharges in a manner consistent with applicable regulations and/or exceed those reguations if they are determined to be ineffective for providing the desired and predicted results.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**90**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to marine water quality resulting from ballast water exchange.
Term or Condition:	The Proponent shall incorporate into its Shipping and Marine Mammals Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of Ship's Ballast Water and Sediment (2004).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**91**
Category:	Marine Environment – Ballast Water

Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to marine water quality in Steensby Inlet.
Term or Condition:	The Proponent shall develop a detailed monitoring plan for fouling that includes sampling areas on ships where antifouling treatment is not applied such as the areas where non-native species are most likely to occur.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**92**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure adequate spill response capacity.
Term or Condition:	The Proponent shall ensure that it maintains the necessary equipment and trained personnel to respond to all sizes of potential spills associated with the Project in a self sufficient manner.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**93**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment at Steensby Inlet.
Term or Condition:	Prior to construction, based on vessel selection and if so required, the Proponent shall reassess the risk analysis of using vessel-based fuel storage, including the potential environmental impacts of containment failure under a range of winter ice conditions, how a spill might spread and the impact of fuel if it does not volatilize to the atmosphere.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**94**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To promote public awareness of Project activities.
Term or Condition:	The Proponent shall consult directly with affected communities regarding its plans for over-wintering of fuel in Steensby Inlet, with discussion topics to include descriptions of the duration of proposed activities, vessel type, spill preparedness and emergency response protocols, environmental impact predictions and answers to community member questions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**95**

Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent, Transport Canada
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment at Steensby Inlet.
Term or Condition:	The Proponent shall meet or exceed all regulatory regulations and requirements as apply to the practice of overwintering a fuel vessel in at Steensby Inlet, with reporting to the NIRB and Transport Canada.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**96**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To ensure adequate oversight of Project activities is occurring.
Term or Condition:	The Proponent will update the NIRB on the results of all compliance monitoring and site inspections undertaken by government agencies for the overwintering of a fuel vessel in Steensby Inlet.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**97**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment along the shipping route.
Term or Condition:	Prior to the commercial shipping of iron ore, the Proponent shall conduct fuel spill dispersion modeling that will, at a minimum, consider: a. Modeling of oil spills in the following areas: i. Pinch points, including: the mouth of Hudson Strait, the Resolution Island Area, the West End of Hudson Strait and Nottingham Island Area; ii. The approach into Steensby Inlet; iii. Shallow water and shorelines; and, iv. Areas that have been identified as having high flows and/or high concentrations of marine mammals, marine fish or seabirds. b. Open water and ice-covered conditions; c. Spill volumes up to and including loss of a full tanker cargo; and, d. Differences in the quantity and properties of each type of bulk fuel transported by vessels when they are at, or in transit to, the port at Steensby Inlet.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**98**
Category:	Marine Environment – Spill Prevention

Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment along the shipping route.
Term or Condition:	The Proponent shall incorporate the results of revised fuel spill dispersion modeling into its impact predictions for the marine environment and its spill response and emergency preparedness plans.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

8.2.12 Marine Wildlife and Marine Habitat

Term and Condition No.	**99**
Category:	Marine Environment – Supplemental Baseline Assessments
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction
Objective:	To supplement baseline information and improve predictions for potential impacts to marine wildlife.
Term or Condition:	The Proponent, working with the Marine Environment Working Group, shall consider and identify priorities for conducting the following supplemental baseline assessments: e. Establish an all-season, inter-annual baseline in Steensby Inlet that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. This shall include the selection and identification of physical, chemical, and biological community/indicator components. The biological indicators shall include both pelagic and benthic species but with emphasis on relatively sedentary benthic species (e.g., sculpins). f. The collection of additional baseline data in Steensby Inlet on walrus, beluga, bearded seal anadromous Arctic Char abundance, distribution ecology and habitat use. g. Enhance baseline data on marine wildlife (fish, invertebrates, birds, mammals, etc.) and to provide more details on species abundance and distribution found in the Project area. This shall include, but not be limited to the following: i. Aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet and at appropriate control location; ii. Shore-based observations of pre-Project narwhal behavior in Milne Inlet. Enhance the baseline for affected freshwater systems, which includes control sites to detect Project-related changes before they cause significant harm.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**100**

Category:	Marine Environment – Supplemental Baseline Assessments
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction
Objective:	To supplement baseline information and improve predictions for potential impacts to marine wildlife.
Term or Condition:	The Proponent shall update its Shipping and Marine Wildlife Management Plan, to include avoidance of polynyas and mitigation measures designed for potential fuel spills along the shipping lane during the winter months, with consideration for the impact of spilled fuel on marine mammals when they might be less mobile or able to avoid contact with spilt fuel or fumes.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**101**
Category:	Marine Environment – Monitoring
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction, Operations
Objective:	To monitor for potential impacts to marine wildlife and marine habitat.
Term or Condition:	The Proponent shall incorporate into the appropriate monitoring plans the following items: j. A monitoring program that focuses on walrus use of Steensby Inlet and their reaction to disturbance from construction activities, aircraft, and vessels. k. Efforts to involve Inuit in monitoring studies at all levels l. Monitoring protocols that are responsive to Inuit concerns m. Marine monitoring protocols are to consider the use of additional detecting devices to ensure adequate monitoring through changing seasonal conditions and daylight n. Schedule for periodic aerial surveys as recommended by the Marine Environment Working Group. o. Periodic aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet, and a suitable control location. Surveys shall be conducted at an appropriate frequency to detect change inter-annual variability. p. Shore-based observations of pre-Project narwhal behavior in Milne Inlet q. Conduct landfast ice monitoring for the duration of the Project Operations phase, which will include: i. The number of ship transits that are able to use the same track; and, ii. The area of landfast ice disrupted annually by ship traffic. r. Monitoring strategy focused on assessing and mitigating interaction between humans and wildlife at the port site(s).
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**102**
Category:	Marine Environment – Traffic Log and Shipping Information

Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To promote public awareness of Project shipping activities for the general public.
Term or Condition:	The Proponent shall ensure that routing of project vessels is tracked and recorded, with data made accessible in real time to communities in Nunavut and Nunavik. A summary of all ship tracks shall be submitted annually to the NIRB.
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**103**
Category:	Marine Environment – Traffic Log and Shipping Information
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor effectiveness of mitigation of shipping impacts to marine wildlife.
Term or Condition:	The Proponent shall report annually to the NIRB regarding project-related ship track and sea ice information, including: f. A record of all ship tracks taken along both shipping routes covering the entire shipping season; g. An overlay of ship tracks onto ice imagery to determine whether ships are effectively avoiding shore leads and polynyas; h. A comparison of recorded ship tracks to the expected nominal shipping route, and probable extent of year-round shipping during periods of ice cover and open-water; i. An assessment of the level of adherence to the nominal shipping route and the spatial extent of the shipping zone of influence; and j. Marine bird and mammal species and number of individuals attracted to ship tracks in ice.
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**104**
Category:	Marine Environment – Traffic Log and Shipping Information
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To prevent impacts to marine wildlife from Project shipping activities.
Term or Condition:	Subject to safety considerations and the potential for conditions as determined by the crew of transiting vessels, to result in route deviations, the Proponent shall require project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors. The proponent shall summarize all

	incidences of deviations from the nominal shipping route as presented in the FEIS to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**105**
Category:	Marine Environment – Traffic Log and Shipping Information
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To prevent impacts to marine wildlife from Project shipping activities.
Term or Condition:	The Proponent shall ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait, are identified and implemented prior to commencement of shipping operations. These measures could include, but are not limited to: d. changes in the frequency and timing (including periodic suspensions) of shipping during winter months, i.e., when interactions with marine mammals are likely to be the most problematic; e. reduced shipping speeds where ship-marine mammal interactions are most likely; f. identification of alternate shipping routes through Hudson Strait for use when conflicts between the proposed routes and marine mammals could arise. Repeated winter aerial survey results showing marine mammal distribution and densities in Hudson Strait would greatly assist in this task
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**106**
Category:	Marine Environment – Shipboard Observers
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure that interactions with marine mammals are effectively monitored for.
Term or Condition:	The Proponent shall ensure that shipboard observers are employed through all seasons and provided with the means to effectively carry out assigned duties. The role of shipboard observers in shipping operations should be taken into consideration during the design of ore carriers, with climate controlled stations and shipboard lighting incorporated to permit visual sightings by shipboard observers during all seasons and conditions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**107**
Category:	Marine Environment – Shipboard Observers
Responsible Parties:	The Proponent

Project Phase:	Construction
Objective:	To ensure that interactions with marine mammals are effectively monitored for.
Term or Condition:	The Proponent shall revise the proposed "surveillance monitoring" to improve the likelihood of detecting strong marine mammal responses occurring too far ahead of the ship to be detectable by observers aboard the ore carriers. A baseline study early in the shipping operations could employ additional surveillance to detect potential changes in distribution patterns and behavior. At an ambitious scope, this might be achieved using unmanned aircraft flown well ahead of ships, or over haul-out sites in the case of walruses.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**108**
Category:	Marine Environment – Shipboard Observers
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To ensure that interactions with marine mammals are effectively monitored for.
Term or Condition:	The Proponent shall ensure that data produced by the surveillance monitoring program is analysed rigorously by experienced analysts (in addition to being discussed as proposed in the FEIS) to maximize their effectiveness in providing baseline information, and for detecting potential effects of the project on marine mammals in the Regional Study Area. It is expected that data from the long-term monitoring program be treated with the same rigor.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**109**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	The Proponent shall conduct a monitoring program to confirm the predictions in the FEIS with respect to disturbance effects from ships noise on the distribution and occurrence of marine mammals. The survey shall be designed to address effects during three seasons of the year, and include locations in Hudson Strait and Foxe Basin. The survey shall continue over a sufficiently lengthy period to determine the extent to which acclimation occurs for narwhal, beluga, bowhead and walrus.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**110**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent, Marine Environment Working Group

Project Phase:	Construction, Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	The Proponent shall develop a monitoring protocol that, but is not limited to, acoustical monitoring, to facilitate assessment of the potential short term, long term, and cumulative effects of vessel noise on marine mammals and marine mammal populations. The Proponent is expected to work with the Marine Environment Working Group to determine appropriate early warning indicator(s) that to ensure rapid identification of negative impacts.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**111**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction, Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	The Proponent shall develop clear thresholds for determining if negative impacts as a result of vessel noise are occurring. Mitigation and adaptive management practices shall be developed to restrict negative impacts as a result of vessel noise. This shall include, but not be limited to: a. Identifications of zones where cumulative noise could be mitigated due to biophysical features (e.g., water depth, distance from migration routes, distance from overwintering areas etc.); b. Vessel transit planning, for all seasons, to determine the degree to which cumulative sound impacts can be mitigated through the seasonal use of different zones.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**112**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction, Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	Prior to commercial shipping of iron ore, the Proponent, in conjunction with the Marine Environment Working Group, shall develop a monitoring protocol that includes, but is not limited to, acoustical monitoring that provides an assessment of the negative effects (short and long term cumulative) of vessel noise on marine mammals. Monitoring protocols will need to carefully consider the early warning indicator(s) that will be best examined to ensure rapid identification of negative impacts. Thresholds shall be developed to determine if negative impacts as a result of vessel noise are occurring. Mitigation and adaptive management practices shall be developed to restrict negative impacts as a result of vessel noise. This shall include, but not be limited to: d. Identification of zones where noise could be mitigated due to biophysical features (e.g., water depth, distance from migration routes, distance from overwintering areas etc.);

	e. Vessel transit planning, for all seasons. f. A monitoring and mitigation plan is to be developed, and approved by Fisheries and Oceans Canada prior to the commencement of blasting in marine areas.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**113**
Category:	Marine Environment – Arctic Char
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine fish in Steensby Inlet.
Term or Condition:	The Proponent shall conduct monitoring of marine fish and fish habitat, which includes but is not limited to, monitoring for Arctic Char stock size and health condition in Steensby Inlet, as recommended by the Marine Environment Working Group
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**114**
Category:	Marine Environment – Arctic Char
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine fish in Steensby Inlet.
Term or Condition:	In the event of the development of a commercial fishery in the Steensby Inlet area, the Proponent, in conjunction with the Marine Environment Working Group, shall update its monitoring program for marine fish and fish habitat to ensure that the ability to identify Arctic Char stock(s) potentially affected by Project activities and monitor for changes in stock size and structure of affected stocks and fish health (condition, taste) is maintained.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**115**
Category:	Marine Environment – Arctic Char
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To prevent impacts to marine fish in Steensby Inlet.
Term or Condition:	The Proponent is encouraged to continue to explore off-setting options in both the freshwater and marine environment to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**116**
Category:	Marine Environment – Blasting

Responsible Parties:	The Proponent, Fisheries and Oceans Canada
Project Phase:	Construction
Objective:	To prevent impacts to marine fish and fish habitat from explosives.
Term or Condition:	Prior to construction, the Proponent shall develop additional mitigation measures to minimize the effects of blasting on marine fish and fish habitat, marine water quality and wildlife that includes, but is not limited to compliance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by Fisheries and Oceans Canada for use in the North.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**117**
Category:	Marine Environment – Blasting
Responsible Parties:	The Proponent, Fisheries and Oceans Canada
Project Phase:	Construction
Objective:	To prevent impacts to marine fish and fish habitat from explosives.
Term or Condition:	The Proponent shall ensure that that blasting in, and near, marine water shall only occur during periods of open water. Blasting in, and near, fresh water shall to the greatest degree possible, only occur in open water. If blasting is required during ice-covered periods, it must meet requirements established by Fisheries and Oceans Canada.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**118**
Category:	Marine Environment – Blasting
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to marine fish and fish habitat from explosives.
Term or Condition:	The Proponent shall incorporate into the appropriate mitigation plan prior to construction, thresholds for the use of specific mitigation measures meant to prevent or limit marine wildlife disturbance, such as bubble curtains for blasting, and nitrate removal.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**119**
Category:	Marine Environment – Ringed Seals
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction
Objective:	To prevent impacts to ringed seals from icebreaking associated with Project shipping.
Term or Condition:	The Proponent shall, in conjunction with the Marine Environment Working Group, monitor ringed seal birth lair abundance and distribution for at least two years prior to the start of icebreaking to develop a baseline, with continued monitoring over the life of the project as necessary to test the accuracy of the impact predictions and determine if mitigation is needed.

	Monitoring shall also include a control site outside of the Project's zone of influence.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**120**
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals associated with Project shipping.
Term or Condition:	The Proponent shall ensure that, subject to vessel and human safety considerations, all project shipping adhere to the following mitigation procedures in while the vicinity of marine mammals: d. Wildlife will be given right of way; e. Ships will when possible, maintain a straight course and constant speed, avoiding erratic behavior; and f. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife have moved away from the immediate area.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**121**
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent, Fisheries and Oceans Canada, Environment Canada
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and seabird colonies associated with Project shipping.
Term or Condition:	The Proponent shall immediately report any accidental contact by project vessels with marine mammals or seabird colonies to Fisheries and Oceans Canada and Environment Canada respectively, by notifying the appropriate regional office of the: g. Date, time and location of the incident; h. Species of marine mammal or seabird involved; i. Circumstances of the incident; j. Weather and sea conditions at the time; k. Observed state of the marine mammal or sea bird colony after the incident; and, l. Direction of travel of the marine mammal after the incident, to the extent that it can be determined.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**122**
Category:	Marine Environment – Marine Mammal Interactions

Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and seabird colonies associated with Project shipping.
Term or Condition:	The Proponent shall summarize and report annually to the NIRB regarding accidental contact by project vessels with marine mammals or seabird colonies through the applicable monitoring report.
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**123**
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and seabird colonies associated with Project shipping.
Term or Condition:	The Proponent shall provide sufficient marine mammal observer coverage on project vessels to ensure that collisions with marine mammals and seabird colonies are observed and reported through the life of the Project. The marine wildlife observer protocol shall include, but not be limited to, protocols for marine mammals, seabirds, and environmental conditions and immediate reporting of significant observations to the ship masters of other vessels along the shipping route, as part of the adaptive management program to address any items that require immediate action.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**124**
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and marine fish populations from increased harvesting pressures in Project areas.
Term or Condition:	The Proponent shall prohibit project employees from recreational boating, fishing, and harvesting of marine wildlife in project areas, including Steensby Inlet and Milne Inlet. The Proponent is not directed to interfere with harvesting by the public in or near project areas, however, enforcement of a general prohibition on harvesting in project areas by project employees during periods of active employment (i.e. while on site and between workshifts) is required.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**125**
Category:	Marine Environment – Public Engagement

Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assess acceptability of acoustic deterrent devices for the general public.
Term or Condition:	Prior to use of acoustic deterrent devices, the Proponent shall carry out consultations with communities along the shipping route to assess the acceptability of these devices. Feedback received from community consultations shall be incorporated into the appropriate mitigation plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**126**
Category:	Marine Environment – Public Engagement
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To incorporate local input into monitoring data collection.
Term or Condition:	The Proponent shall design monitoring programs to ensure that local users of the marine area in communities along the shipping route have opportunity to be engaged throughout the life of the Project in assisting with monitoring and evaluating potential project-induced impacts and changes in marine mammal distributions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**127**
Category:	Marine Environment – Public Engagement
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To promote public awareness and engagement with Project shipping activities.
Term or Condition:	The Proponent shall ensure that communities and groups in Nunavik are kept informed of project shipping activities and are provided with opportunity to participate in the continued development and refinement of shipping related monitoring and mitigation plans.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**128**
Category:	Marine Environment – Public Engagement
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure habitat compensation is acceptable to local communities.
Term or Condition:	The Proponent shall consult with local communities as fish habitat off-setting options are being considered and demonstrate its incorporation of input received into the design of the Fish Habitat Off-Setting Plan required

	to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

SOCIO-ECONOMIC TERMS AND CONDITIONS

8.2.13 Population Demographics

Term and Condition No.	**129**
Category:	Population Demographics – Qikiqtaaluk Socio-Economic Monitoring Committee
Responsible Parties:	The Proponent, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Description of the general monitoring framework to be developed in consultation with the Qikiqtaaluk Socio-Economic Monitoring Committee.
Term or Condition:	The Proponent is strongly encouraged to engage in the work of the Qikiqtaaluk Socio-Economic Monitoring Committee along with other agencies and affected communities, and it should endeavour to identify areas of mutual interest and priorities for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the North Baffin region as a whole.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**130**
Category:	Population Demographics – Project-specific monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Recognizing that some Project-specific socio-economic monitoring initiatives may be best addressed in smaller more focused working groups, this is encouraged where possible.
Term or Condition:	The Proponent should consider establishing and coordinating with smaller socio-economic working groups to meet Project specific monitoring requirements throughout the life of the Project.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**131**
Category:	Population Demographics – Monitoring demographic changes
Responsible Parties:	The Proponent, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring

Objective:	To monitor demographic changes affecting the North Baffin communities and the territory as a whole in order to understand changes and to evaluate the Proponent's predictions as related to population demographics.
Term or Condition:	The Qikiqtaaluk Socio-Economic Monitoring Committee is encouraged to engage in the monitoring of demographic changes including the movement of people into and out of the North Baffin communities and the territory as a whole. This information may be used in conjunction with monitoring data obtained by the Proponent from recent hires and/or out-going employees in order to assess the potential effect the Project has on migration.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**132**
Category:	Population Demographics – Training programs
Responsible Parties:	The Proponent, North Baffin Hamlets, Municipal Training Organization, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To develop training programs in ways which contribute to limiting the potential for migration to occur as North Baffin residents seek training and employment opportunities in the larger centre of Iqaluit.
Term or Condition:	The Proponent is encouraged to partner with other agencies such as Hamlet organizations in the North Baffin region, the Municipal Training Organization, and the Government of Nunavut in order to adapt pre-existing, or to develop new programs which encourage Inuit to continue living in their home communities while seeking ongoing and progressive training and development. Programs may include driver training programs offered within Hamlets, providing upgraded equipment to communities for use in municipal works, providing incentives for small businesses to remain operating out of their community of origin, or supplementing existing recreational facilities and programming in North Baffin communities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**133**
Category:	Population Demographics – Monitoring demographic changes
Responsible Parties:	The Proponent, members of QSEMC, Government of Nunavut, Nunavut Housing Corporation
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Training programs may be developed with the goal of limiting the potential for migration to occur as North Baffin residents may choose to seek employment and therefore move from smaller North Baffin communities to the larger centre of Iqaluit.
Term or Condition:	The Proponent is encouraged to work with the Qikiqtaaluk Socio-Economic Monitoring Committee and in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation and other relevant stakeholders, design and implement a

	voluntary survey to be completed by its employees on an annual basis in order to identify changes of address, housing status (i.e. public/social, privately owned/rented, government, etc.), and migration intentions while respecting confidentiality of all persons involved. The survey should be designed in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation and other relevant stakeholders. Non-confidential results of the survey are to be reported to the Government of Nunavut and the NIRB.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**134**
Category:	Population Demographics – Employee origin
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Project-specific information regarding employee origin is important to comparing predictions of labour availability and employment opportunities with actual levels of employment from various demographic segments over different geographic areas.
Term or Condition:	The Proponent shall include with its annual reporting to the NIRB a summation of employee origin information as follows: a. The number of Inuit and non-Inuit employees hired from each of the North Baffin communities, specifying the number from each; b. The number of Inuit and non-Inuit employees hired from each of the Kitikmeot and Kivalliq regions, specifying the number from each; c. The number of Inuit and non-Inuit employees hired from a southern location or other province/territory outside of Nunavut, specifying the locations and the number from each; d. The number of non-Canadian foreign employees hired, specifying the locations and number from each foreign point of hire.
Reporting Requirements:	To be determined following approval of the Project by the Minister

8.2.14 Education and Training

Term and Condition No.	**135**
Category:	Education and Training – Employee work/study programs
Responsible Parties:	The Proponent, Qikiqtani Inuit Association
Project Phase:	Pre-Construction, Operations
Objective:	Recognizing the 12-hour work days inherent with work at the Project site, it is not clear how employees would successfully engage in a work/study program offered by the Proponent.
Term or Condition:	The Proponent is encouraged to consider offering additional options for work/study programs available to Project employees (in addition to study programs at project sites that would be offered to employees when off shift).

Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**136**
Category:	Education and Training – Transferable skills and training
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Government of Nunavut, Municipal Training Organization
Project Phase:	Pre-Construction, Operations
Objective:	Offering training which results in certifications that are valid for employment at more than one site or in different fields provides an investment in the long-term employability of Nunavummiut.
Term or Condition:	The Proponent is encouraged to work with training organizations and/or government departments offering mine-related or other training in order to provide additional opportunities for employees to gain meaningful and transferable skills, credentials and certifications especially where such training of employees offered by the Proponent remains valid only at the Mary River Project sites.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**137**
Category:	Education and Training – Transferable skills and training
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction
Objective:	Offering training which results in certifications that are valid for employment at more than one site or in different fields provides an investment in the long-term employability of Nunavummiut.
Term or Condition:	Prior to construction, the Proponent shall develop an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during employment at Mary River, such listing to indicate which of these certifications and licenses would be transferable to a similar job site within Nunavut. This listing should be updated on an annual basis, and is to be provided to the NIRB upon completion and whenever it is revised.
Reporting Requirements:	The initial listing should be provided to the NIRB at least 60 days prior to the start of construction, an annually thereafter or as may otherwise be required.

Term and Condition No.	**138**
Category:	Education and Training – Inuit employee training
Responsible Parties:	The Proponent, Qikiqtani Inuit Association
Project Phase:	Pre-Construction
Objective:	Working together with the Qikiqtani Inuit Association to prepare effective training programs developed specifically for Inuit will assist in employee preparedness and may improve employee retention.
Term or Condition:	The Proponent is encouraged to work with the Qikiqtani Inuit Association to ensure the timely development of effective Inuit training and work-ready

	programs.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**139**
Category:	Education and Training – Hiring southern Canadians and foreign employees
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction
Objective:	With the unknown availability of labour from the North Baffin region and Nunavut as a whole to provide employment to the Project, the need to employ southern Canadians or foreign workers may implicate the Proponent's on-site language, cross-cultural awareness, and other programming. Having information available regarding the sourcing of labour for the Project is important to ensuring the Proponent and others are prepared for any influx of southern or foreign employees.
Term or Condition:	Prior to commencing construction, the Proponent is requested to undertake and provide the results of a detailed labour market analysis which provides quantitative predictions of the number of employees that may reasonably need to be sourced from southern Canada and from foreign markets, identifying where applicable, the country of origin for the foreign labour.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**140**
Category:	Education and Training – Survey of Nunavummiut employees
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations
Objective:	Monitoring the number of employees who leave previous employment in their home communities or who leave some type of formal eductaion in pursuit of employment with the Project is important to evaluate predictions made and the potential impacts to North Baffin communities and education rates.
Term or Condition:	The Proponent is encouraged to survey Nunavummiut employees as they are hired and specifically note the level of education obtained and whether the incoming employee resigned from a previous job placement or educational institution in order to take up employment with the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**141**
Category:	Education and Training – Training of Inuit
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction
Objective:	To ensure that effective training is available in a timely manner.
Term or Condition:	The Proponent is encouraged to work with the Qikiqtani Inuit Association prior to construction in order to prioritize the provision of training of Inuit to serve as employees in monitoring or other such capacities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.15 Livelihood and Employment

Term and Condition No.	142
Category:	Livelihood and Employment – Employee cohesion
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To promote cohesion between employees on site, and between employees and their families.
Term or Condition:	The Proponent is encouraged to address the potential direct and indirect effects that may result from Project employees' on-site use of various Inuktitut dialects as well as other spoken languages, specifically paying attention to the potential alienation of some employees that may occur as a result of language or other cultural barriers.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	143
Category:	Livelihood and Employment – Employee family contact
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To enable and foster connection and contact between employees and family members.
Term or Condition:	The Proponent is encouraged to consider the use of both existing and innovative technologies (e.g. community radio station call-in shows, cell phones, video-conferencing, Skype, etc.) as a way to ensure Project employees are able to keep in contact with family and friends and to ward off the potential for feelings of homesickness and distance to impact on employee retention and family stability.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	144
Category:	Livelihood and Employment – Requirements for employment
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To ensure that the prerequisites and requirements for employment are clear and well known in work readiness programs.
Term or Condition:	The Proponent is encouraged to make requirements for employment clear in its work-readiness and other public information programs and documentation, including but not limited to: education levels, criminal records checks, policies relating to drug and alcohol use and testing, language abilities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	145

Category:	Livelihood and Employment – Barriers to employment for women
Responsible Parties:	The Proponent, Government of Nunavut, members of QSEMC
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor and understand the existence of barriers to employment for women specifically relating to childcare availability and costs.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring Committee to monitor the barriers to employment for women, specifically with respect to childcare availability and costs.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**146**
Category:	Livelihood and Employment – Availability of childcare for Project employees
Responsible Parties:	Government of Nunavut and Qikitani Inuit Association
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To lessen the barriers to employment as relating to the availability of childcare.
Term or Condition:	The Government of Nunavut and the Qikiqtani Inuit Association are strongly encouraged to investigate the possibility for Project revenue streams to support initaitves or programs which offset or subsidize childcare for Project employees.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**147**
Category:	Livelihood and Employment – Affordability of housing
Responsible Parties:	The Proponent, Government of Nunavut and Nunvut Housing Corporation
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To lessen the barriers to maintaining employment as relating to the availability and costs of housing.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut and the Nunavut Housing Corporation to investigate options and incentives which might enable and provide incentive for employees living in social housing to maintain employment as well as to negotiate for and obtain manageable rental rates.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.16 Economic Development and Self-Reliance, and Contracting and Business Opportunities

Term and Condition No.	**148**

Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Food security
Responsible Parties:	The Proponent, Members of the QSEMC
Project Phase:	Pre-Operations
Objective:	To improve understanding of the interactions between the Project and Inuit harvesting and how this relates to food security for residents of the North Baffin.
Term or Condition:	The Proponent is encouraged to undertake collaborative monitoring in conjunction with the Qikiqtaaluk Socio-Economic Monitoring Committee's monitoring program which addresses Project harvesting interactions and food security and which includes broad indicators of dietary habits.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**149**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts of temporary closure
Responsible Parties:	The Proponent
Project Phase:	Pre-Operations
Objective:	To further the understanding of how a temporary closure may impact on the well-being of the residents and businesses of the North Baffin region.
Term or Condition:	Prior to the commencement of operations, the Proponent is required to undertake an analysis of the risk of temporary mine closure, giving consideration to how communities in the North Baffin region may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**150**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts to visitors of Sirmilik National Park
Responsible Parties:	The Proponent, Parks Canada
Project Phase:	Pre-Operations
Objective:	To limit potential of Project impacts upon visitors, researchers and/or beneficiary users of the Sirmilik National Park.
Term or Condition:	The Proponent will ensure the following: a. The Proponent will maintain, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons. b. The Proponent will ensure that certification of noise compliance is current, where compliance is applicable. c. The Proponent is encouraged to provide Parks Canada with regular flight and shipping schedules that can be used to brief Park visitors. d. The Proponent is strongly encouraged to provide due consideration to wilderness experience during its operations in the open water season, especially during the month of August which is typically a time of high use by sea kayakers.

Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**151**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Access to housing
Responsible Parties:	The Proponent
Project Phase:	Pre-Operations
Objective:	To investigate ways that economic development and self-reliance may improve access to housing by employees.
Term or Condition:	The Proponent is encouraged to investigate measures and programs designed to assist Project employees with homeownership or access to affordable housing options.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**152**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – IIBA contract requirements
Responsible Parties:	The Proponent, Qikiqtani Inuit Association
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To improve ability of small businesses to access Project contract and sub-contract opportunities.
Term or Condition:	The Qikiqtani Inuit Association is encouraged to provide the Board and the Qikiqtaaluk Socio-Economic Monitoring Committee with information regarding the effectiveness of any provisions within the Inuit Impact and Benefit Agreement which may require that larger contracts be broken down into smaller size in order that they are reasonably managed by smaller businesses in the North Baffin region, while respecting any confidential or priveliged information.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.17 Human Health and Well-Being

Term and Condition No.	**153**
Category:	Human Health and Well-Being – Employee and family health and well-being
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Closure
Objective:	To provide adequate medical services on site, including those that contribute to the mental health and well-being of all employees.
Term or Condition:	The Proponent is encouraged to employ a mental health professional to provide counselling to Inuit and non-Inuit employees in order to positively contribute toward employee health and well-being.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	154
Category:	Human Health and Well-being – Indirect impacts to health and well-being
Responsible Parties:	The Proponent, Government of Nunavut, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To understand the indirect impacts of the Project upon health and well-being.
Term or Condition:	The Proponent shall work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring Committee to monitor potential indirect effects of the Project, including indicators such as the prevalence of substance abuse, gambling issues, family violence, marital problems, rates of sexually transmitted infections and other communicable diseases, rates of teenage pregnancy, high school completion rates, and others as deemed appropriate.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	155
Category:	Human Health and Well-being – Employee cohesion
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction
Objective:	To encourage the on-site cohesion of employees through cultural-awareness and social programs.
Term or Condition:	The Proponent is strongly encouraged to provide the NIRB with an updated report on its development of mitigation measures and plans to deal with potential cultural conflicts which may occur at site as these may become needed.
Reporting Requirements:	To be provided at least 60 days prior to the commencement of any construction activities.

Term and Condition No.	156
Category:	Human Health and Well-Being – Support initiatives
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assist with fostering well-being within point-of-hire communties.
Term or Condition:	The Proponent is encouraged to assist with the provision and/or support of recreation programs and opportunities within the potentially affected communities in order to mitigate potential impacts of employees' absences from home and community life.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	157
Category:	Human Health and Well-Being – Counseling and treatment programs
Responsible Parties:	The Proponent

Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To make available, necessary treatment and counseling services for employee and family well-being.
Term or Condition:	The Proponent should consider providing counseling and access to treatment programs for substance and gambling addictions as well as which address domestic, parenting, and marital issues that affect employees and/or their families.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.18 Community Infrastructure and Public Services

Term and Condition No.	**158**
Category:	Community Infrastructure and Public Services – Impacts to health services
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor indirect Project impacts to health and social services provided by the Government of Nunavut.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut and other parties as deemed relevant in order to develop a Human Health Working Group which addresses and establishes monitoring functions relating to pressures upon existing services and costs to the health and social services provided by the Government of Nunavut as such may be impacted by Project-related in-migration of employees, to both the North Baffin region in general, and to the City of Iqaluit in particular.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**159**
Category:	Community Infrastructure and Public Services – Impacts to infrastructure
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor Project-related impacts to infrastructure within the Local Study Area communities.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut to develop an effects monitoring program that captures increased Project-related pressures to community infrastructure in the Local Study Area communities, and to airport infrastructure in all point-of-hire communities and in Iqaluit.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**160**
Category:	Community Infrastructure and Public Services – Distribution of benefits

Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure the distribution of benefits is done in a way that off-sets Project-related impacts to infrastructure or services.
Term or Condition:	The Government of Nunavut and the Qikiqtani Inuit Association are encouraged to cooperate to ensure in a broad sense, that Project benefits are distributed across impacted communities and across various demographic groups within these communities in a manner that best offsets any Project-related impacts to infrastructure or services.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**161**
Category:	Community Infrastructure and Public Services – Policing
Responsible Parties:	The Proponent, Government of Nunavut, Royal Canadian Mounted Police
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure the territorial government and its policing service are adequately prepared to handle any Project-related increases to the need for service and associated impacts.
Term or Condition:	The Government of Nunavut should be prepared for any potential increased need for policing, and ensure that the Royal Canadian Mounted Police is prepared to handle ongoing Project-related demographic changes and subsequent crime prevention that may be needed as a result of the development, operation, and closure of the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.19 Culture, Resources and Land Use

Term and Condition No.	**162**
Category:	Culture, Resources and Land Use – Public consultation
Responsible Parties:	The Proponent, Elders and community members of the North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure the ongoing and consistent involvement of Elders and community members in developing and revising monitoring and mitigation plans.
Term or Condition:	The Proponent should make all reasonable efforts to engage Elders and community members of the North Baffin communities in order to have community level input into its monitoring programs and mitigative measures, to ensure that these programs and measures have been informed by traditional activities, cultural resources, and land use as such may be implicated or impacted by ongoing Project activities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	163
Category:	Culture, Resources and Land Use – Public consultation
Responsible Parties:	The Proponent, North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To involve communities in the development and evolution of management and monitoring plans.
Term or Condition:	The Proponent shall continue to engage and consult with the communities of the North Baffin region in order to ensure that Nunavummiut are kept informed about the Project activities, and more importantly, in order that the Proponent's management and monitoring plans continue to evolve in an informed manner.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	164
Category:	Socio-Economic Impacts – Shipping notification
Responsible Parties:	The Proponent, Elders and community members of the North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	In order to inform members of North Baffin communities of planned Project shipping transits such that community members' planned travel routing may be adjusted to avoid interaction with Project ships and/or ship tracks.
Term or Condition:	The Proponent is required to provide notification to communities regarding scheduled ship transits throughout the regional study area, real-time data regarding ships in transit and any changes to the proposed shipping schedule.
Reporting Requirements:	The infomration required shall be provided on a monthly basis at a minimum or more often as the Proponent determines necessary and is to be provided to the Proponent's community liaison officers and those of the Qikiqtani Inuit Association as well as the Hunters and Trappers Organizations and Hamlet organizations of the North Baffin communities, Coral Harbour, and the NIRB's Monitoring Officer. Where deviations from the proposed schedule or routing are required, this information shall be provided as soon as possible.

Term and Condition No.	165
Category:	Socio-Economic Impacts – Emergency shelters
Responsible Parties:	The Proponent, Elders and community members of the North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	In order to provide for human safety precautions in the event of adverse weather or other emergency situations along segments of linear transportation infrastructure.

Term or Condition:	The Proponent is strongly encouraged to provide buildings along the rail line and Milne Inlet Tote Road for emergency shelter purposes, and shall make these available for all employees and any land users travelling through the Project area. In the event that these buildings cannot, for safety or other reasons be open to the public, the Proponent shall set up emergency shelters (e.g. seacans outfitted for survival purposes) every 1 kilometre along the rail line and Milne Inlet Tote Road. These shelters must be placed along Tote Road and rail routing prior to operation of either piece of infrastructure, and must be maintained for the duration of project activities, including the closure phase.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**166**
Category:	Socio-Economic Impacts – Public Consultation
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure members of the public are able to access shipping infomration on an as-required basis in order to inform potential users of the scheduled Project activities which could require deviations to land users schedules or routing.
Term or Condition:	The Proponent should ensure through its consultation efforts and public awareness campaigns that the public have access to shipping operations personnel for transits into and out of both Steensby Inlet port and Milne Inlet port either via telephone or internet contact, in order that any questions regarding ice conditions or ship movements that could assist ice users in preparing for travel may be answered by Project staff in a timely fashion.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.20 Benefits, Royalty, and Taxation

Term and Condition No.	**167**
Category:	Benefits, Royalty and Taxation – Partnership Agreements
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	Pre-Construction
Objective:	The Proponent and the Government of Nunavut develop a formalized partnership agreement.
Term or Condition:	The Proponent and the Government of Nunavut are strongly encouraged to, as soon as practical following the issuance of the Project Certificate, enter into discussions to negotiate a Development Partnership Agreement.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.21 Governance and Leadership

Term and Condition No.	168
Category:	Governance and Leadership – Monitoring program
Responsible Parties:	The Proponent, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Outline variables that are relevant to the Project and which should be adopted by the QSEMC's monitoring program.
Term or Condition:	The specific socioeconomic variables as set out in Section 8 of the Board's Report, including data regarding population movement into and out of the North Baffin Communities and Nunavut as a whole, barriers to employment for women, project harvesting interactions and food security, and indirect Project effects such as substance abuse, gambling, rates of domestic violence, and education rates that are relevant to the Project, be included in the monitoring program adopted by the Qikiqtani Socio-Economic Monitoring Committee.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	169
Category:	Governance and Leadership – Monitoring economic effects
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To maintain transparency inform communities in relation to economic benefits associated with the Project.
Term or Condition:	The Proponent provide an annual monitoring summary to the NIRB on the monitoring data related to the regional and cumulative economic effects (positive and negative) associated with the Project and any proposed mitigation measures being considered necessary to mitigate the negative effects identified.
Reporting Requirements:	To be developed following approval of the Project by the Minister

OTHER TERMS AND CONDITIONS

8.2.22 Accidents and Malfunctions

Term and Condition No.	170
Category:	Accidents and Malfunctions – Terrestrial Wildlife Management and Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction
Objective:	Updates to plan in order to better understand the potential for, and to minimize possible caribou-railway interactions.
Term or Condition:	The Proponent shall include in an updated Terrestrial Wildlife Management

	and Monitoring Plan, plans for increased caribou monitoring efforts including weekly winter track surveying and summer and fall surveys undertaken on foot twice per month.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**171**
Category:	Accidents and Malfunctions – Terrestrial Wildlife Management and Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction
Objective:	Updates to plan in order to minimize potential for caribou-railway interactions.
Term or Condition:	The Proponent shall include within its updated Terrestrial Wildlife Management and Monitoring Plan, a commitment to establish deterrents along the railway embankment at any areas where it is determined that caribou are utilizing the embankment to facilitate movement and where such movement presents a likelihood of caribou mortality to occur.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**172**
Category:	Accidents and Malfunctions – Overwintered fuel vessel
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction
Objective:	To provide evidence that vessel to be used is fit and insured for proposed use.
Term or Condition:	The Proponent is encouraged to provide the Government of Nunavut with evidence that the vessel that it intends to use for the overwintering of fuel has been designed and certified for use under the conditions which it is expected to operate, and that it be required to provide copies of the vessel owners' insurance policies.
Reporting Requirements:	The required information is to be provided to the Government of Nunavut as soon as possible, and at a minimum, at least 60 days prior to the commencement of any construction related shipping.

Term and Condition No.	**173**
Category:	Accidents and Malfunctions – Use of containment booms
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Closure
Objective:	To provide additional spill contingency measures for spills in marine areas.
Term or Condition:	The Proponent shall employ full containment booms during all ship-to-shore and other marine-based fuel transfer events.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**174**

Category:	Accidents and Malfunctions – Community level spill response
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction Operations, Closure
Objective:	To improve community ability to assist in spill response.
Term or Condition:	The Proponent and the Canadian Coast Guard are required to provide spill response equipment and annual training to Nunavut communities along the shipping route to potentially improve response times in the event of a spill.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**175**
Category:	Accidents and Malfunctions – Ship track markers in ice cover
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Hunters and Trappers Organizations of the North Baffin region and Coral Harbour
Project Phase:	Pre-Construction, Construction Operations, Closure
Objective:	To ensure that measures taken to mark the shipping track(s) during periods of ice cover are effective in advising ice-based travelers, and that, where necessary, revisions to this practice can be made to ensure public safety.
Term or Condition:	The Proponent shall, in coordination and consultation with the Qikiqtani Inuit Association and the Hunters and Trappers Organizations of the North Baffin communities and Coral Harbour, provide updates to its Shipping and Marine Mammals Management Plan to include adaptive management measures it proposes to take should the placement of reflective markers along the ship track in winter months not prove to be a feasible method of marking the track to ensure the safety of ice-based travelers.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**176**
Category:	Accidents and Malfunctions – Revised spill modeling
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction Operations, Closure
Objective:	To improve community ability to assist in spill response.
Term or Condition:	The Proponent is required to revise its spill planning to include additional trajectory modeling for areas of Hudson Strait, such as Mill Island, where walrus concentrate, as well as for mid-Hudson Strait during winter conditions.
Reporting Requirements:	The updated modeling shall be provided to the NIRB and to Fisheries and Oceans Canada for review at least 3 months prior shipment of bulk fuel to Steensby Inlet.

Term and Condition No.	**177**
Category:	Accidents and Malfunctions – Foreign flagged vessels
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction Operations, Closure
Objective:	To ensure foreign flagged ships operating in Canadian waters are held to the

	same standard as domestic ships with regard to emergency response planning.
Term or Condition:	The Proponent shall enroll any foreign flagged vessels commissioned for Project-related shipping within Canadian waters into Transport Canada's Marine Safety Delegated Statutory Inspection Program.
Reporting Requirements:	To be determined following approval of the Project by the Minister

8.2.23 Alternatives Analysis

Term and Condition No.	**178**
Category:	Alternatives Analysis – Mill Island shipping route consideration
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Nunavut Impact Review Board, Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance
Objective:	To prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island.
Term or Condition:	Subject to safety considerations and the potential for conditions, as determined by the crew of transiting vessels, to result in route deviations, the Proponent shall require project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island.
Reporting Requirements:	Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors. The Proponent shall summarize all incidences of deviations from the nominal shipping route as presented in the FEIS to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.

8.2.24 Cumulative Effects

Where uncertainty or concern with respect to the potential for cumulative effects has been noted, the Board has proposed recommended terms and conditions to specifically address those cumulative effects and such terms and conditions are outlined in that section.

8.2.25 Regulatory Capacity

Term and Condition No.	**179**
Category:	Regulatory Capacity
Responsible Parties:	All agencies and departments with a regulatory mandate or who have land ownership functions.
Project Phase:	Pre-Construction
Objective:	In order to ensure that all regulatory agencies with responsibility over some

	aspect of the Project are aware of and prepared with the resources, resilience and preparedness that will be required to meet the increased and ongoing obligations associated with a project of this scale.
Term or Condition:	Within 12 months of the issuance of the Project Certificate, all regulatory agencies with a regulatory mandate for the project, land owners and mineral owners are to conduct an internal capacity assessment to identify the monitoring, inspection, enforcement and reporting requirements for the specific regulatory agency, land owner or mineral owner that will be associated with the Project during operations, including taking into account the resource commitments necessary to participate fully in the key Project-specific Working Groups.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**180**
Category:	Regulatory Capacity
Responsible Parties:	All agencies and departments with a regulatory mandate or who have land ownership functions.
Project Phase:	Pre-Construction
Objective:	To ensure that all agencies with a mandate in relation to the Project become prepared for their responsibilities and to ensure that gaps in regulatory capacity that could threaten the effectiveness of monitoring, mitigation and adaptive management measures are identified and addressed.
Term or Condition:	Within 24 months of the issuance of the Project Certificate, and on the basis of the internal capacity assessment, all regulatory agencies with a regulatory mandate for the project, land owners and mineral owners are to develop an implementation plan that identifies the ongoing resource commitments associated with the Project, the gaps in existing capacity and the mechanisms for ensuring there is capacity to meet the required commitments throughout the Project's lifecycle.
Reporting Requirements:	To be developed following approval of the Project by the Minister

8.2.26 Operational Variability

Term and Condition No.	**181**
Category:	Operational Variability
Responsible Parties:	The Proponent
Project Phase:	Operations
Objective:	To apply the precautionary principle in respect of potential effects on marine wildlife and marine habitat from changes to shipping frequency that may result from a significant increase in mine production for an extended period of time.
Term or Condition:	Baffinland shall not exceed 20 ore carrier transits to Steensby Port per month during the open water season and 242 transits per year in total.
Reporting Requirements:	To be developed following approval by the Minister

8.2.27 Performance Bonding

Having duly considered the reclamation security proposed under the auspices of the Proponent's Preliminary Mine Closure and Reclamation Plan and that will be reviewed in detail in the Nunavut Water Board water licensing process, the insurance requirements applicable to the proposed overwintering of the fuel vessel and the Railway insurance requirements, the Board does not consider it necessary to recommend the inclusion of any additional performance bonding or financial assurance mechanisms in the project certificate.

8.2.28 Transboundary Effects

Term and Condition No.	**182**
Category:	Transboundary Effects – Makivik Corporation involvement in the Marine Environment Working Group
Responsible Parties:	The Proponent, members of the Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enable Makivik Corporation and Nunavik communities near shipping lanes to remain informed and involved in those shipping activities which could affect the marine environment and marine mammals.
Term or Condition:	The Marine Environment Working Group established for this Project shall invite a representative from Makivik Corporation to be a member of the Group
Reporting Requirements:	To be developed following approval by the Minister

Term and Condition No.	**183**
Category:	Transboundary Effects – Marine Environment Working Group reporting
Responsible Parties:	The Proponent, members of Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enable Makivik Corporation and Nunavik communities near shipping lanes to remain informed and involved in those shipping activities which could affect the marine environment and marine mammals.
Term or Condition:	Regardless of whether Makivik Corporation participates as a member of the Marine Environment Working Group, the Marine Environment Working Group will provide Makivik Corporation with regular updates regarding the activities of the Marine Environment Working Group throughout the Project life cycle.
Reporting Requirements:	To be developed following approval by the Minister

Term and Condition No.	**184**
Category:	Transboundary Effects – Reporting to Marine Environment Working Group (MEWG)
Responsible Parties:	The Proponent, Makivik Corporation

Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enable Makivik Corporation and Nunavik communities near shipping lanes to remain informed and involved in those shipping activities which could affect the marine environment and marine mammals.
Term or Condition:	Baffinland shall make available to Makivik Corporation any ship route deviation reports provided to the NIRB in accordance with the terms and conditions set out in Section 4.12.4 of this Report.
Reporting Requirements:	To be developed following approval by the Minister

8.3 Recommendations for Regulatory Agencies, Land and Mineral Owners

In addition to the recommended Terms and Conditions directed to Baffinland and that may, depending upon the Minister's decision and direction under Section 12.5.7 of the NLCA, become part of the NIRB Project Certificate, recognizing the critical role of regulatory agencies and the land and mineral owners in contributing to monitoring and reporting on project-specific effects, including positive benefits and negative impacts, the Board has also provided some recommendations for regulatory agencies and the land and mineral owners. In providing these recommendations, the Board wishes to emphasize that the NIRB recognizes the jurisdiction and discretion of these parties in terms of the extent to which they choose to adopt and implement any of the following recommendations in whole or in part; the Board's purpose in providing the recommendations is simply to convey the central regulatory and land use issues that were identified in the course of this Review by the participants and to provide some suggested mechanisms to support the parties in addressing these key issues.

All Regulatory Agencies, Land and Mineral Owners

1. Within 12 months of the issuance of the Project Certificate conduct an internal capacity assessment to identify the monitoring, inspection, enforcement and reporting requirements for the specific regulatory agency, land owner or mineral owner that will be associated with the Project during operations, including taking into account the resource commitments necessary to participate fully in the three key Project-specific Working Groups.
2. Within 12 months of completing the internal capacity assessment, develop an implementation plan that identifies the on-going resource commitments associated with the Project, the gaps in existing capacity and the mechanisms for ensuring there is capacity to meet the required commitments throughout the Project's lifecycle.

Government of Nunavut

3. As soon as practical following the issuance of the Project Certificate, enter into discussions with Baffinland to negotiate a Development Partnership Agreement.

APPENDIX A: Table of Commitments from the Final Hearing

The following Table provides a listing of commitments confirmed by the parties at the Final Hearing. Although some of these commitments have provided the basis for the Board's recommended Terms and Conditions, others, due to various reasons, such as limits on the Board's jurisdiction, are not expressly included as Terms and Conditions or recommendations to the parties. However, even for those commitments that have not become recommendations or recommended Terms and Conditions, recognizing the importance of these commitments to the positions of the parties in addressing their concerns and narrowing the issues discussed before the Board at the Final Hearing and also recognizing the importance of honouring commitments to the credibility of the Board's assessment process, it is the Board's expectation that all parties will make best efforts to fulfill all commitments included in the attached Table of Commitments.

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
Project Setting and Description				
1	Environmental Design (Incorporation of Knowledge)	Baffinland is committed to incorporating the relevant changes in the site layout for infrastructure and design that will take into account the results of continuing environmental advances so as to address engineering concerns related to the Mary River Project.	Baffinland (July 16, 2012)	**engineering/ all**
2	Design (Fugitive Dust)	Baffinland is committed to developing and implementing mitigation measures which control fugitive dust emissions.	Igloolik Community Member (July 19, 2012)	**engineering/ design**
3	Operations (Ore Processing and Tailings)	Baffinland will undertake only the physical crushing and screening processing of the ore generated from the Mary River Project within the project area.	Baffinland (July 16, 2012)	**operations**
4	Operations (Mine Production Rate)	Baffinland is committed to providing information on potential variability of the mine's iron ore production rate in response to QIA's comments.	QIA (July 19, 2012)	**operations**
5	Regulatory Requirement	Baffinland is committed meeting or exceeding all regulatory requirements that relate to the Mary River Project, including	Baffinland (July 16, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		significant reporting to provide details on the project's performance.		
6	Environmental Design (Contact Water)	Baffinland is committed to collecting and treating, if required, contact water generated from mining activities to ensure that relevant effluent criteria are met as established in the water licence.	Baffinland (July 16, 2012)	**all**
7	Design (Fuel Storage)	Baffinland is committed to constructing their on-land fuel storage with the capability to last at least 16 months, in lined, engineered structures as part of its normal operating practice.	Baffinland (July 17, 2012; July 19, 2012)	**design/ operations**
8	Fuel Transport (Overwintering of Fuel Vessel)	As part of standard operation procedures, Baffinland is committed to avoiding ship-to-shore transfer of fuel during freeze-up or break-up periods.	Baffinland (July 19, 2012)	**all**
9	Fuel Transfer	Baffinland is committed to undertaking fuel transfer from vessels to shore under good weather conditions. Once the ore dock is constructed at Steensby, fuel transfer will be carried out at the freight dock.	Baffinland (July 23, 2012)	**pre-construction /construction**
10	Fuel (Spill / Leak Detection)	Baffinland is committed to installing leak detection instrumentation on the overwintering fuel vessel and to conduct ongoing monitoring in the vicinity of the vessel, in accordance with relevant guidelines and regulations. Baffinland is committed to using best management practices to reduce the possibility of spills.	NIRB (July 17, 2012)	**construction**
11	Spill Contingency Planning	Baffinland is committed to maintaining an up to date Spill Contingency Plan and will distribute copies of the Plan to	Baffinland (July 19, 2012)	**engineering/ design**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		stakeholders.		
12	Disaster Management Plan	Baffinland is committed to developing and implementing a Security Plan in accordance with regulatory requirements.	GN (July 23, 2012)	**all**
13	Marine Vessel Specifications (Ship Design)	Baffinland is committed to providing full specifications to Transport Canada, including the sizes, type and design of ore carriers proposed for use, prior to finalizing the ore carrier design.	Baffinland (July 19, 2012)	**design**
14	Railway	Baffinland commits that buildings placed along the rail line for signal and switch requirements will also be intended for use as emergency shelters for Railway personnel.	NIRB (July 17, 2012)	**engineering/ design**
15	Design (Railway-Caribou)	Baffinland is committed to creating crossings along the Railway track which facilitate the passage of caribou.	Baffinland (July 23, 2012)	**operations**
16	Design (Railway Traffic Crossings)	Baffinland is committed to designing the rail track to allow for snow machine and ATV crossings at points intersecting with identified travel routes.	Baffinland (July 17, 2012)	**engineering/ design**
17	Design (Hunter Consultation on Traffic Crossings)	Baffinland is committed to work with the QIA to hold meetings in the communities to discuss safety aspects involved with travellers who may potentially be crossing the ship track and Railway using designated (or other) crossings.	QIA (July 18, 2012)	**all**
18	Railway (Locomotives)	Baffinland is committed to purchasing the highest tier (per the USA's EPA standards) of locomotive available for use at the Mary River project.	NIRB (July 23, 2012)	**engineering/ design**
19	Railway	Baffinland is committed to having a Railway Emergency Response Plan and trained personnel for responding to Railway specific	(July 19, 2012)	**engineering/ design**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		emergencies.		
20	Railway (Track Clearing)	Baffinland is committed to installing ploughs on the sides of locomotives in order to ensure that the rail line is kept clear of snow during Railway operations.	Cape Dorset (July 19, 2012)	**operations**
21	Railway (Maintenance/ Accident Prevention)	Baffinland is committed to carrying out regular maintenance and inspection of the Railway infrastructure in accordance with established guidelines and regulations.	NTI (July 16, 2012)	**operations**
22	Railway (Regulatory)	Baffinland is committed to comply with the Railway Locomotive Inspection and Safety Rules, Railway Freight Car Inspection and Safety Rules referenced in Transport Canada's final written submission to the NIRB.	NIRB (July 23, 2012)	**all**
23	Railway (Fuel Transfer)	Baffinland is committed to developing and finalizing an operating strategy that will provide the highest level of safety in transportation of fuel using rail cars.	TC (July 17, 2012)	**operations**
24	Railway (Fuel and Hazardous Substance Transfer)	Baffinland is committed to ensuring that bulk fuel transported by rail is contained in tanker cars and all hazardous substances will be shipped in sea containers to minimize spill potential along the rail line.	Baffinland (July 23, 2012)	**operations**
25	Railway (Regulatory)	Baffinland is committed to providing detailed maps of the Railway corridor to the Nunavut Planning Commission if a NIRB project certificate is issued for the Mary River Project.	Baffinland (July 16, 2012)	**regulatory/ operations**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
26	Marine (Safety Officer)	Baffinland is committed to appointing one of its personnel to act as a Marine Safety Officer during the construction, operation, and closure phases of the Mary River Project.	NIRB (July 23, 2012)	**all**
27	Marine (Shipping Vessel)	Baffinland is committed to meeting with the community of Igloolik once the vessels used to transport ore for the Mary River Project are selected.	Igloolik (July 19, 2012)	**construction**
28	Marine (Fuel Vessel)	Baffinland is committed to visiting Igloolik to provide the community with information on the fuel vessel selected for overwintering at Steensby Inlet.	NIRB (July 23, 2012)	**engineering/ design**
29	Marine (Shipping Route)	Baffinland is committed to ensuring that normal shipping activities will be confined to the Nunavut Settlement Area on the north side of the Hudson Straight where conditions are favorable to shipping and to incorporating the necessary mitigation measures to ensure that shipping does not impact marine wildlife and that community concerns are addressed from an operational standpoint.	Baffinland (July 16, 2012)	**all**
30	Marine (Shipping Notification)	Baffinland is committed to providing shipping notification on a regular and consistent basis to relevant communities prior to shipping and construction activities for the Mary River Project.	NIRB (July 16, 2012)	**all**
31	Marine (Shipping Speed)	Baffinland is committed to ensuring that the vessels used to transport ore from the Mary River Project are of appropriate class and specification, and will operate in a manner that is consistent with applicable	Baffinland (July 17, 2012)	**design/ operations**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		regulations and guidelines.		
32	Marine (Noise)	Baffinland is committed to providing the QIA with a copy of the frequency-noise distribution graph for sound generated by ore ship propellers travelling through ice.	QIA	**engineering/ design**
33	Marine (Shipping)	Baffinland is committed to implementing appropriate mitigation measures including but not limited to, periodic suspension of shipping if Baffinland determines that shipping-related activities are negatively impacting the project area.	Baffinland (July 16, 2012)	**operations**
34	Marine (Shipping Route)	Baffinland is committed to issuing public notices to affected communities advising them of shipping traffic schedules, and marker locations. Baffinland is also committed to installing reflective markers at a distance of approximately 100 metres from the ship track ice edge with approximately 500 metres between each marker on both sides of the shipping lane during the winter period to ensure that shipping lanes are visible at all times. Baffinland is committed to conducting weekly patrols along these shipping lanes to ensure that markers are in place and remain visible.	NIRB (July 17, 2012)	**operations**
35	Marine (Shipping Route)	Baffinland is committed to providing affected communities and other stakeholders with details on the type and location of all navigational aids installed along the shipping route.	CCG (July 19, 2012)	**pre-construction /operations**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
36	Marine (Shipping)	Baffinland is committed to providing real-time data on the location of ships or vessels associated with the Mary River Project to all affected communities.	NTI (July 19, 2012)	**operations**
37	Marine (Regulatory)	Baffinland will consider enrolling its vessels operating under the Canadian flag in Transport Canada's Marine Safety Delegated Statutory Inspection Program, as recommended in TC's final written submission.	NIRB (July 23, 2012)	**operations**
38	Design (Abandonment & Restoration)	Baffinland is committed to undertaking a phased approached to any abandonment and restoration, as well as final abandonment and restoration, of the Mary River Project site(s) and relevant monitoring activities in a manner that is consistent with applicable guidelines and regulations.	Baffinland (July 16, 2012)	**all/closure**
39	Design (Abandonment & Restoration)	Baffinland is committed to investigating and exploring the potential for native species of flora to be used for re-vegetating areas disturbed within the project area.	Baffinland/GN (July 26, 2012)	**all/closure**
40	Monitoring (Abandonment and Restoration)	Baffinland is committed to undertaking environmental effects monitoring during the mine life mine as well as after closure.	NIRB (July 23, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
Involvement of Interested Parties				
41	Stakeholders	Baffinland is committed to participating in ongoing initiatives, including working with stakeholders, to address all issues related to the Mary River Project.	Baffinland (July 23, 2012)	**all**
42	Abandonment & Restoration	Baffinland is committed to establishing a working/ advisory group consisting of stakeholders of the Mary River Project to identify and address issues surrounding abandonment and restoration activities associated with the Mary River Project. The terms of reference, as well as information on all issues identified to be resolved by the working group, will be made available to the NIRB and interested persons for information and/or review purposes.	Baffinland/QIA (July 19, 2012)	**all/closure**
43	General	Baffinland is committed to collaborating with the Government of Nunavut on issues related to the Mary River Project for which both the GN and Baffinland have a stake.	GN (July 23, 2012)	**all**
44	General	GN is committed to working with Baffinland to ensure that an understanding of their respective roles are confirmed.	GN (July 23, 2012)	**all**
45	Working Groups	Baffinland is committed to participating in the Qikiqtani Socio-Economic Monitoring Committee (SEMC) working group to ensure that relevant effects of the Mary River Project are monitored.	Baffinland (July 19, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
46	Working Group	Baffinland is committed to participating in formal, stakeholder working groups, such as terrestrial environment and marine environment working groups, as established within and/or outside of the scope of the IIBA, to gain input, insight, advice and oversight from stakeholders throughout the life of the project and to ensure that adaptive management principles are applied accordingly.	Baffinland (July 16, 2012)	**all**
47	Working Group	GN is committed to participating in the terrestrial environment and marine environment working groups as deemed appropriate. GN is committed to providing feedback on terms of reference for the working group.	Baffinland/QIA (July 20, 2012)	**pre-construction /construction**
48	Working Group	EC is committed to participating in the terrestrial environment and marine environment working groups to the extent that EC resources would allow, and in the context of its mandate.	NTI (July 20, 2012)	**all**
49	Working Group (Caribou)	GN is committed to developing, with the terrestrial working group, ways to monitor caribou within the project area during sensitive life cycle periods.	NTI (July 24, 2012)	**all**
50	Research (North Baffin Caribou Herd)	GN is committed to undertaking further research to determine the status, health, population and other variables associated with the North Baffinland caribou herd.	QIA (July 20, 2012)	**all**
51	Monitoring (Marine Shipping)	GN is committed to working with other departments and agencies to develop and implement an effective marine monitoring program aimed at determining the impacts of shipping activities	NTI (July 20, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		on the marine environment.		
52	IIBA	QIA is committed to explaining the contents of an IIBA for the Mary River Project to the GN once the IIBA has been finalized.	QIA (July 20, 2012)	**all**
53	IIBA (Inuit Input into Monitoring)	Baffinland is committed to contributing to overseeing the implementation of the IIBA including monitoring of the Project on a continuous basis to allow for ongoing Inuit input related to environmental and social impacts.	Baffinland (July 17, 2012)	**all**
54	Fish Habitat Monitoring	DFO is committed to ongoing involvement in assisting Baffinland to develop a robustly designed and long-term monitoring program for verifying impact prediction, demonstrating the efficacy of mitigation measures, and adjusting those measures as needed.	NTI (July 23, 2012)	**all**
55	CCG Services	CCG is committed to exploring the possibility of increases to its level of service in order to support shipping associated with the Mary River Project, if approved.	NTI (July 20, 2012)	**all**
56	Consultation Opportunities (Regulatory)	AANDC is committed to exploring the possibility of having its assigned representatives inform communities in the Qikiqtani Region about the Project as it pertains to their mandate and/or responsibilities.	Igloolik Community Member (July 24, 2012)	**all**
Ecosystemic Effects				
57	Management Plans	Baffinland is committed to updating its management plans to reflect new information, new practices and changes to operating conditions.	Baffinland (July 17, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
58	Monitoring	Baffinland is committed to contributing to regional monitoring and information gathering.	NIRB (July 16, 2012)	**all**
59	Meteorology and Climate (Reporting)	Baffinland is committed to giving consideration to the sharing of weather data collected for the Mary River Project with Environment Canada to post on its public weather network.	NIRB (July 23, 2012)	**operations**
60	Air Quality (Fugitive Dust from Railway Shipping)	Baffinland is committed to monitoring fugitive dust emissions on vegetation along the first few kilometres of the Railway leaving both terminals (Mary River and Steensby Inlet). This monitoring will be extended if it is identified that other areas of the project site are also being impacted by fugitive dust emissions.	EC (July 16, 2012)	**all**
61	Air Quality (SO_2 Emissions)	Baffinland is committed to conducting passive monitoring of SO_2 at the Steensby Inlet camp.	EC (July 16, 2012)	**all**
62	Project Design (Marine Shipping Air Emissions)	Baffinland is committed to estimating marine shipping vessel emissions associated with the Mary River Project.	EC (July 23, 2012)	**all**
63	Project Design (Greenhouse Gas)	Baffinland and its shipping partners are committed to working with shipyards to reduce fuel consumption by 20% or more.	Baffinland (July 16, 2012)	**engineering/ design**
64	Groundwater/Surfa ce Water (Waste Rock Effluent)	Baffinland is committed to carrying out ongoing characterization of the waste rock to ensure that effluent discharge criteria associated with waste rock storage areas are met at all times.	Baffinland (July 16, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
65	Design & Monitoring (Quarries)	Baffinland is committed to developing a Quarry Management Plan for each of the quarries developed for the Mary River Project and to ensure that all quarry materials used are non-acid generating and non-metal leaching in chemical characteristics.	Baffinland (July 16, 2012)	**all**
66	Monitoring	Baffinland is committed to the development and implementation of a monitoring program during the construction and other phases of the Mary River Project.	EC (July 23, 2012)	**construction/al l**
67	Monitoring Plans (Vegetation)	Baffinland is committed to carrying out the monitoring plans for native plant species and vegetative health.	Baffinland (July 19, 2012)	**operations/ abandonment & reclamation**
68	Vegetation (Invasive Species / Re-vegetation Studies)	Baffinland is committed to examining invasive species as well as carry out reclamation experiments on re-vegetation options and practices within the Mary River Project area.	Baffinland (July 16, 2012; July 23, 2012)	**all**
69	Terrestrial (Monitoring)	Baffinland is committed to undertaking the required or relevant monitoring for both terrestrial wildlife and vegetation throughout the life of the Mary River Project to verify predictions made as well as to confirm compliance with applicable regulations. The information would be used to support adaptive management strategies and required mitigation measures.	Baffinland (July 16, 2012)	**operations**
70	Terrestrial (Management Plan)	Baffinland is committed to developing and implementing a Terrestrial Environment Management Plan and track progress of the plan to assist in	Baffinland/GN (July 16, 2012)	**operations**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		guiding adaptive management strategies slated for implementation at the Mary River Project.		
71	Railway (Caribou Mortality)	Baffinland is committed to investigating any mortality to caribou resulting from project activity, and to investing in a precautionary monitoring and adaptive management program to mitigate caribou responses to development activities.	QIA (July 16, 2012; July 17, 2012)	**operations**
72	Railway (Caribou Mortality)	Baffinland is committed to implementing appropriate measures to ensure that all caribou carcasses linked to the project activities are discarded in accordance with applicable regulations and guidelines.	Arctic Bay Community Member (July 19, 2012)	**all**
73	Railway (Caribou Mortality)	Baffinland is committed to implementing traffic controls along the Railway if it is determined that the caribou mortality rate is impacted by the Railway.	Baffinland (July 16, 2012)	**operations**
74	Monitoring (Wolves)	Baffinland is committed to monitoring the effects of the Mary River Project on wolf and wolf denning areas.	Baffinland (July 23, 2012)	**all**
75	Monitoring (Birds)	Baffinland is committed to monitoring relevant sections of the project area for nesting and migration activities, noting both areas and patterns, for Falcons, Eiders, Red Knots, sea birds, song birds and shore birds.	Baffinland (July 19, 2012)	**all**
76	Monitoring (Birds)	Baffinland is committed to carrying out monitoring over the next few years to look at other types of birds not considered during other research for the Mary River Project.	Hall Beach HTO (July 19, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
77	Monitoring (Marine Birds)	Baffinland is committed to monitoring migratory marine birds during shipping operations using established methodologies.	EC (July 23, 2012)	**all**
78	Monitoring (Marine Birds)	Baffinland is committed to continued contribution to marine bird baseline data collection along southern shipping routes.	EC (July 23, 2012)	**pre-construction**
79	Monitoring (Marine Mammals and Birds)	Baffinland is committed to undertaking marine mammal and bird surveys/studies to determine information gaps related to shipping-related impacts.	DFO (July 19, 2012)	**pre-construction**
80	Monitoring (Marine Shipping Impacts on Wildlife)	Baffinland is committed to working with the stakeholders to undertake studies along the marine shipping route to determine the effects of shipping on marine wildlife and mammals, including ship strikes, for the purposes of collecting baseline information, confirming uncertainties, collecting ongoing data, and identifying and implementing future adaptive management strategies.	Baffinland (July 16, 2012; July 20, 2012); Coral Harbour Community Member (July 19, 2012)	**all**
81	Monitoring (Seals)	Baffinland is committed to monitoring seals on land-fast ice and to limit any potential negative impacts, including reducing the amount of ice disturbed.	Grise Fiord (July 19, 2012)	**operation**
82	Monitoring (Biological Surveys Baseline)	Baffinland is committed to carrying out surveys in the Hudson Straight in 2012 to collect additional baseline data on species that might be potentially impacted by the project.	AANDC (date unknown)	**pre-construction**
83	Monitoring Plan (Ship Strikes)	Baffinland is committed to developing and implementing a Ship Strike Monitoring Plan to capture relevant data for use in adaptive management strategies.	DFO (July 20, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
84	Monitoring (Marine Shipping Impacts on Environment)	Baffinland is committed to monitoring the potential effects of shipping on the marine environment along the shipping route or other areas potentially impacted by the project's shipping activities.	Baffinland (July 23, 2012)	**all**
85	Monitoring (Marine Ballast Water Discharge)	Baffinland is committed to monitoring benthic community and water quality in Steensby Inlet to verify effects of ballast dispersal predication.	DFO/EC (July 19, 2012)	**operations**
86	Mitigation (Marine Ballast Water Discharge)	Baffinland is committed to screening and treating ballast water from the ships associated with the Mary River Project to meet or exceed all regulatory requirements prior to release into the marine environment. In so doing, Baffinland will prevent or minimize the introduction of invasive species into Nunavut's marine environment. Upon release, Baffinland is committed to monitoring impacts of ballast water effluent in areas proximal to the discharge/ exchange points.	NTI/QIA (July 19, 2012)	**operations**
87	Monitoring (Marine Ballast Water Discharge)	Baffinland is committed to monitoring the discharge of ballast water from vessels to ensure that it meets or exceeds applicable regulations, guidelines and discharge criteria and to meet or exceed international standards set for ballast water and any ballast water guidelines approved by Transport Canada.	QIA (July 16, 2012)	**operations**
88	Regulatory (Reporting of Shoreline Study)	Baffinland is committed to making available to the NIRB and to interested persons, by December 31, 2012, the report for the shoreline studies completed for the Mary River	EC (July 19, 2012)	**pre-construction**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		Project in June 2012.		
Socio-Economic Effects				
89	Employment (Hiring Practices MOU)	Baffinland is committed to hiring practices that are consistent with the terms and conditions in the memorandum of understanding for the IIBA.	NIRB (July 19, 2012)	**all**
90	Employment (Hiring Practices)	Baffinland is committed to hiring Inuit at all levels in the company for the Mary River Project and intends to put a targeted recruitment program in place to ensure that Inuit, especially Inuit of the North Baffin Region, are hired.	NIRB (July 17, 2012)	**all**
91	Employment (Preferential Hiring)	Baffinland is committed to the preferential hiring of employees from the defined points of hire, which include the communities of Pond Inlet, Igloolik, Hall Beach, Arctic Bay and Iqaluit. Baffinland may consider other points of hire if it deems that there are sufficient numbers individuals available in those communities who want to work at the project.	Baffinland (July 18, 2012)	**all**
92	Employment (Targeted Training)	Baffinland is committed to implementing a targeted training plan to build capacity among Inuit to fulfill positions within the organization; some of the capacity building initiatives include refresher training, work ready training and education support programs.	Baffinland (July 17, 2012)	**all**
93	Cross-cultural Training	Baffinland is committed to providing a cross-cultural training to both Inuit and non-Inuit employees and to institute ant discriminatory policies and mechanisms to minimize any	NIRB (July 17, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		potential cultural conflicts in the workplace.		
94	Employment (Targeted Training)	Baffinland is committed to providing training linked to specific job positions and to endeavor to implement job-creation partnerships with interested organizations.	Baffinland (July 23, 2012)	**all**
95	Employment (Community Based Job Searching)	Baffinland is committed to distributing information related to available employment at the Mary River Project through its website, community newspapers and other methods of advertising.	Baffinland (July 18, 2012)	**all**
96	Employment (Employee Counseling)	Baffinland is committed to instituting and providing a professional employee assistance and counseling program to assist employees and their family members both at site and at home communities. As part of this program, Baffinland is committed to hiring at least one Inuit Elder to be stationed at each of the the Milne and Mary River sites at all phases of the project to assist in counseling.	NIRB (July 17, 2012; July 23, 2012)	**all**
97	Archaeological Resources	Baffinland is committed to having Inuit Elders visit the Steensby site in 2012 to assist in identifying and ensuring that archaeological sites in the area not impacted by project activities.	Baffinland (July 23, 2012)	**pre-construction**
98	Archaeological Resources	Baffinland is committed to providing training to its employees regarding the protection of archeological resources within the project area.	NTI (July 17, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
99	Medical Facilities (Design)	Baffinland is committed to working with the Government of Nunavut to provide details on the design of medical facilities for the Mary River Project during the regulatory phase of the project.	GN (July 23, 2012)	**pre-construction**
100	Medical Facilities (Staffing)	Baffinland is committed having an on-site medical facility staffed by a registered nurse or certified paramedic in order to attend to any injury that workers might experience on-site, and is further committed to providing medi-vac services as may be required from the mine site to Iqaluit.	QIA (July 17, 2012)	**all**
101	Mitigation (Compensation to Hunters)	Baffinland is committed to implementing mitigation measures which offset the inconvenience and hardship created for Inuit hunters and travelers that have traditionally used the areas encompassed by the shipping route.	NIRB (July 17, 2012)	**operations**
102	Employment (Access to Harvesting)	Baffinland is committed to ensuring that, during key harvesting periods, Inuit employees are given priority to utilize vacation time over southern workers.	CCG/NIRB - Board (July 17, 2012)	**all**
103	Land Use (Hunter Trapper Support)	Baffinland is committed to establishing policies related to Inuit visitation and wildlife harvesting for Inuit employees that is consistent with Baffinland's policies and which also allows for the secure storage of firearms.	Baffinland (July 18, 2012)	**all**
104	Inuit Monitoring Officers	Inuit monitors will be present at the project site, at all times, and during all phases of the project (construction, operation, closure and post closure).	NTI (July 19, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
105	Employment (Language)	Baffinland is committed to ensuring employees who are unilingual Inuktitut speakers will not face barriers to employment at the Mary River Project by hiring Inuktitut translators. Baffinland is also committed to providing work training programs and other relevant employment information in both Inuktitut and English.	NIRB/GN/QIA (July 23, 2012)	**all**
Other Matters Taken Into Account				
106	Emergency Response Plans	Baffinland is committed to seeking and utilizing external expertise to assist them with the development of emergency response planning and to provide formal training specific to accidents and emergency response for the Emergency Response Team, which will be stationed at site at all times. This training would include responding to Railway specific emergencies.	Baffinland (July 17, 2012)	**all**
107	Spill Training/Spill Exercises	Baffinland is committed to conducting routine training exercises and strategically placing resources and equipment on site for spill response.	Baffinland (July 17, 2012)	**all**
108	Spill Training/Spill Exercises	Baffinland is committed, during operations, to conducting regular and annual spill response exercises and training in known and effective techniques for responding to spills and invite the relevant communities of the North Baffin Region to participate.	Baffinland (July 17, 2012)	**operations**
109	Emergency Response	Baffinland is committed to meeting on a regular basis with the emergency response and preparedness working group to	QIA (July 17, 2012)	**all**

No.	Subject	Commitment	Issue raised by (Date of Commitment)	Project Phase/ Timing
		review emergency preparedness.		
110	Emergency/Spill Response Planning	Baffinland is committed to ensuring that adequate resources are allocated to the development and deployment of emergency and spill response capabilities.	NTI (July 19, 2012)	**all**
111	Marine Regulatory (Spill Prevention Plans)	Baffinland is committed to requiring that all project vessels have Shipboard Oil Pollution Emergency Plans (SOPEPs) in place which meets or exceeds the international standards set out in the Port State Control Memorandum of Understanding, as well as trained personnel on board to respond to spills. Baffinland will be self-sufficient for spill response and will contract the services of an established Response Organization to enable the Company to escalate response capabilities to deal with spills of up to 10,000 tonnes. This Response Organization will have expertise in recovery and cleanup of spills along coast line and involving wildlife.	Baffinland (July 19, 2012) NIRB (July 23, 2012)	**all**
112	Spills (Fuel)	Baffinland is committed to ensuring that all spills are reported in accordance with the relevant spill contingency planning and reporting regulations and guidelines.	AANDC (July 19, 2012)	**all**
113	Spills (Fuel)	Baffinland is committed to exploring and implementing measures designed to recover residual fuel from spills under the surface of sea ice.	CCG (July 19, 2012)	**all**

***Note**: This table is a summary of commitments taken during proceedings and/or from the transcripts obtained during the Mary River Final Hearing.

APPENDIX B: List of Exhibits from the Final Hearing

Exhibit	Exhibit Description	Date	From
1	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Operations—Mine Site, Tote Road and Railway English	July 16	Baffinland Iron Mines Corporation (Baffinland)
2	Hard Copy Document dated July 11, 2012 "Baffinland Response to Agency Submissions—FEIS, May 30, 2012"	July 16	Baffinland
3	Hard Copy Cover Letter and Map book From Baffinland to the Nunavut Planning Commission With Respect to the Mary River Railway Corridor On Inuit Lands	July 16	Baffinland
4	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Shipping and the Marine Environment English	July 16	Baffinland
5	Hard Copy Letter dated July 13, 2012 Reply of Baffinland to Department of Fisheries and Oceans Written Submissions	July 16	Baffinland
6	Hard Copy Letter dated July 6, 2012 and five proposed Monitoring Plans Sent by Baffinland	July 16	Baffinland
7	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Terrestrial Wildlife and Migratory Birds English	July 16	Baffinland
8	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Operations—Mine Site, Tote Road and Railway Inuktitut	July 17	Baffinland
9	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Shipping and the Marine Environment Inuktitut	July 17	Baffinland
10	Hard Copy	July 17	Baffinland

Exhibit	Exhibit Description	Date	From
	PowerPoint Presentation Baffinland Technical Presentation Terrestrial Wildlife and Migratory Birds Inuktitut		
11	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Accidents and Malfunctions, Preparedness and Emergency Response English	July 17	Baffinland
12	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Accidents and Malfunctions, Preparedness and Emergency Response Inuktitut	July 17	Baffinland
13	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Socio Economics and Archaeology English	July 17	Baffinland
14	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Socio Economics and Archaeology Inuktitut	July 17	Baffinland
15	Hard Copy PowerPoint Presentation Baffinland Technical Presentation Operations—Mine Site, Tote Road and Railway English (Updated version of Exhibit 1 to include figures presented in oral testimony on July 16)	July 17	Baffinland
16	Hard Copy PowerPoint Presentation NTI Intervenor Submission English	July 17	Nunavut Tunngavik Inc. (NTI)
17	Hard Copy PowerPoint Presentation NTI Intervenor Submission Inuktitut	July 17	NTI
18	Hard Copy PowerPoint Presentation QIA Intervenor Submission English	July 17	Qikiqtani Inuit Association (QIA)
19	Hard Copy PowerPoint Presentation	July 17	QIA

Exhibit	Exhibit Description	Date	From
	QIA Intervenor Submission Inuktitut		
20	Hard Copy PowerPoint Presentation NPC Submission NIRB Final Hearing Baffinland—Mary River Project English	July 17	Nunavut Planning Commission (NPC)
21	Hard Copy PowerPoint Presentation NPC Submission NIRB Final Hearing Baffinland—Mary River Project Inuktitut	July 17	NPC
22	Hard Copy PowerPoint Presentation AAANDC Intervenor Submission Presentation for the Final Hearing on Baffinland's Proposed Mary River Iron Ore Project English and Inuktitut	July 17	Aboriginal Affairs and Northern Development Canada (AANDC)
23	Hard Copy PowerPoint Presentation AANDC Intervenor Submission Presentation for the Final Hearing on Baffinland's Proposed Mary River Iron Ore Project French	July 17	AANDC
24	Hard Copy PowerPoint Presentation EC Intervenor Submission Presentation to the NIRB Regarding Baffinland Mary River Project English	July 18	Environment Canada (EC)
25	Hard Copy PowerPoint Presentation EC Intervenor Submission Presentation to the NIRB Regarding Baffinland Mary River Project Inuktitut	July 18	EC
26	Hard Copy PowerPoint Presentation EC Intervenor Submission Presentation to the NIRB Regarding Baffinland Mary River Project French	July 18	EC
27	Hard Copy PowerPoint Presentation	July 18	Department of Fisheries and

Exhibit	Exhibit Description	Date	From
	DFO Intervenor Submission Mary River Project Baffinland, NIRB Public Hearing English and Inuktitut		Oceans Canada (DFO)
28	Hard Copy PowerPoint Presentation CCG Intervenor Submission NIRB Final Hearings Baffinland Mary River Project English	July 18	Canadian Coast Guard (CCG)
29	Hard Copy PowerPoint Presentation NRCan Intervenor Submission Mary River Mine Nunavut Impact Review Board Public Hearing English	July 18	Natural Resources Canada (NRCan)
30	Hard Copy PowerPoint Presentation NRCan Intervenor Submission Mary River Mine Nunavut Impact Review Board Public Hearing Inuktitut	July 18	NRCan
31	Hard Copy PowerPoint Presentation NRCan Intervenor Submission Mary River Mine Nunavut Impact Review Board Public Hearing French	July 18	NRCan
32	Hard Copy PowerPoint Presentation TC Intervenor Submission Nunavut Impact Review Board Final Hearings Baffinland Mary River Project Technical Presentation English and Inuktitut	July 18	Transport Canada (TC)
33	Hard Copy PowerPoint Presentation TC Intervenor Submission Nunavut Impact Review Board Final Hearings Baffinland Mary River Project Technical Presentation French	July 18	TC
34	Hard Copy PowerPoint Presentation Makivik Corporation Intervenor Submission Presentation to the Nunavut Impact Review Board	July 19	Makivik Corporation

Exhibit	Exhibit Description	Date	From
	English		
35	Hard Copy PowerPoint Presentation Makivik Corporation Intervenor Submission Presentation to the Nunavut Impact Review Board Inuktitut	July 19	Makivik Corporation
36	Hard Copy Letter dated August 17, 2009 From Baffinland to Makivik Corporation	July 19	Baffinland
37	Hard Copy PowerPoint Presentation NMRIRB Intervenor Submission Final Hearing Submissions English	July 19	Nunavik Marine Region Impact Review Board (NMRIRB)
38	Hard Copy PowerPoint Presentation NMRIRB Intervenor Submission Final Hearing Submissions Inuktitut	July 19	NMRIRB
39	Hard Copy PowerPoint Presentation Baffinland Summary Presentation for Community Roundtables English	July 19	Baffinland
40	Hard Copy PowerPoint Presentation Baffinland Summary Presentation for Community Roundtables Inuktitut	July 19	Baffinland
41	Hard Copy PowerPoint Presentation Qikiqtani Inuit Association Mary River Project Committee Questions and Issues Milne Inlet Tote Road, Mary River Mine Site and Railway, Terrestrial Wildlife and Migratory Birds, Spill Prevention and Emergency Response for Community Roundtables English	July 19	QIA
42	Hard Copy PowerPoint Presentation Qikiqtani Inuit Association Mary River Project Committee Questions and Issues Milne Inlet Tote Road, Mary River Mine Site and Railway, Terrestrial Wildlife	July 19	QIA

Exhibit	Exhibit Description	Date	From
	and Migratory Birds, Spill Prevention and Emergency Response for Community Roundtables Inuktitut		
43	Hard Copy PowerPoint Presentation Qikiqtani Inuit Association Mary River Project Committee Questions and Issues Shipping & Marine Environment and Steensby Port for Community Roundtables English	July 20	QIA
44	Hard Copy PowerPoint Presentation Qikiqtani Inuit Association Mary River Project Committee Questions and Issues Shipping & Marine Environment and Steensby Port for Community Roundtables Inuktitut	July 20	QIA
45	Hard Copy PowerPoint Presentation Qikiqtani Inuit Association Mary River Project Committee Questions and Issues Socio-Economics and Archaeology English	July 20	QIA
46	Hard Copy PowerPoint Presentation Qikiqtani Inuit Association Mary River Project Committee Questions and Issues Socio-Economics and Archaeology Inuktitut	July 20	QIA
47	Hard Copy PowerPoint Presentation Government of Nunavut Conclusions and Recommendations Regarding the Mary River Project Final Environmental Impact Statement English	July 23	Government of Nunavut (GN)
48	Hard Copy PowerPoint Presentation Government of Nunavut Conclusions and Recommendations Regarding the Mary River Project Final Environmental	July 23	GN

Exhibit	Exhibit Description	Date	From
	Impact Statement Inuktitut		
49	Hard Copy Document Natural Resources Canada Responses to Questions Received at the Nunavut Impact Review Board July 19, 2012 Public Hearings	July 24	NRCan
50	Hard Copy Document Municipal Council of Igloolik Final Comments on the Proposed Mary River Project	July 24	Municipal Council of Igloolik
51	Hard Copy Document Qikiqtani Inuit Association List of names entitled "People who used to live in and around Steensby Inlet"	July 25	QIA
52	Hard Copy Figure Double Hull Vessel Schematic	July 26	Baffinland
53	Hard Copy Document Qikiqtani Inuit Association Document entitled "Initial Subject Matters Proposed for the Marine Environment Working Group"	July 26	QIA
54	Hard Copy Document Government of Nunavut, Department of Executive and Intergovernmental Affairs Response to QIA Questions in Iqaluit	July 26	GN
55	Hard Copy Document Government of Nunavut Mining policy "Parnautit: A foundation for the future"	July 26	Baffinland
56	Hard Copy Document Nunavut General Monitoring Program "Weaving Our Tapestry: The Nunavut General Monitoring Program"	July 26	Baffinland
57	Hard Copy PowerPoint Presentation Canadian Coast Guard Untitled slides regarding "Information on Hudson	July 27	CCG

Exhibit	Exhibit Description	Date	From
	Strait”		
58	Hard Copy Document Arcelor Mittal “Human Rights Policy”	July 27	Lloyd Lipsett
59	Hard Copy Transcript Dr. Zacharius Kunuk Transcript of pre-recorded video presentation	July 27	Lloyd Lipsett
60	Hard Copy Written Statement dated July 19, 2012 Hamlet of Pond Inlet English	July 27	Hamlet of Pond Inlet
61	Hard Copy Written Statement dated July 19, 2012 Hamlet of Pond Inlet Inuktitut	July 27	Hamlet of Pond Inlet
62	Hard Copy Document Jesse Nutarak Statement from Community Roundtable session	July 27	Jesse Nutarak
63	Hard Copy Document GN Recommended Terms and Conditions For a Mary River Project Certificate (if one is issued)	July 28	GN
64	Hard Copy Document Baffinland Commitments made in response to recommendations of the Government of Nunavut	July 28	Baffinland
65	Hard Copy Document Baffinland Commitments made in response to recommendations of the Department of Fisheries and Oceans	July 28	Baffinland
66	Hard Copy Document Baffinland Closing Statement, Pond Inlet, July 28, 2012	July 28	Baffinland

APPENDIX C: List of Acronyms

AANDC Aboriginal Affairs and Northern Development Canada
ᑲᓇᑕᒥ ᓄᓇᖃᖅᑳᖅᑐᓕᕆᔩᑦ ᐅᑭᐅᖅᑕᖅᑐᒥᓗ ᐱᕙᓪᓕᐊᔪᓕᕆᔩᑦ

ARD Acid Rock Drainage
ᐅᔭᕋᐃᑦ ᐆᑖᕐᓇᖅᑐᖅᑕᓖᑦ ᖁᕐᓕᐊᕐᓂᖏᑦ

ATV All-Terrain Vehicles
ᓇᐅᒃᑯᐃᓐᓈᕐᓇᖅᑐᑦ ᓄᓇᓯᐅᑏᑦ

CCG Canadian Coast Guard
ᑲᓇᑕᒥ ᐅᒥᐊᕐᔪᐊᓕᕆᔨᒃᑯᑦ

CEA Cumulative Effects Assessment
ᐊᒃᑐᖅᑕᐅᓯᒪᕐᑲᓯᐅᔾᔭᐅᓯᒪᔪᓂᒃ ᓇᓗᓇᐃᔭᐃᓂᖅ

COPC Constituents of Potential Concern
ᐃᓱᒫᓗᑕᐅᕐᑲᓯᐅᔾᔭᐅᑐᐃᓐᓇᓕᐊᓖᑦ

CTA Canadian Transportation Agency
ᑲᓇᑕᒥ ᐃᖏᕐᕋᔪᓕᕆᔨᓪᒪᕆᒃᑯᑦ ᓄᓇᓯᐅᑎᑯᑖᓕᕆᔨᒃᑯᑦ

DFO Fisheries and Oceans Canada
ᑲᓇᑕᒥ ᐃᖃᓗᓕᕆᔩᑦ ᐃᒪᕐᒥᐅᑕᓕᕆᔩᓪᓗ

EC Environment Canada
ᑲᓇᑕᒥ ᐊᕙᑎᓕᕆᔩᑦ

EIS Environmental Impact Statement
ᐊᕙᑎᒥᐅᑕᓃᑦᑐᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᕐᑲᓯᐅᔾᔭᐅᑐᐃᓐᓇᓕᐊᕐᑲᕐᓂᖏᓐᓄᑦ ᐅᓂᒃᑳᓕᐊᖅ

EMP Environmental Management Plan
ᐊᕙᑎᒥᐅᑕᓃᑦᑐᑦ ᐊᐅᓚᑕᐅᓂᖏᓐᓄᑦ ᐸᕐᓇᐅᑦ

FEIS Final Environmental Impact Statement
ᑭᖑᓪᓕᖅᐹᖅ ᐊᕙᑎᒥᐅᑕᓃᑦᑐᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᕐᑲᓯᐅᔾᔭᐅᑐᐃᓐᓇᓕᐊᕐᑲᕐᓂᖏᓐᓄᑦ
ᐅᓂᒃᑳᓕᐊᖅ

GDP Gross Domestic Product
ᑲᓇᑕᒥ ᓂᐅᕕᐊᒃᓴᕐᑯᑎᖏᓐᓄᑦ ᐱᔨᑦᓯᕋᐅᑎᖏᑦᓄᓪᓗ ᑲᑎᓪᓗᒋᑦ ᐆᓇᐅᔭᓕᐊᑦ

GHG Greenhouse Gas
ᓯᓚᕐᔪᐊᑉ ᐅᑦᓯᒃᓯᕙᓪᓕᐊᔾᔪᑎᖓ

GN Government of Nunavut
ᓄᓇᕗᑦ ᒐᕙᒪᖓ

HC Health Canada
ᑲᓇᑕᒥ ᐋᓐᓂᐊᕐᑲᙱᑦᑐᓕᕆᔨᒃᑯᑦ

HTO Hunters' and Trappers' Organization
ᐊᓯᕙᖅᑏᑦ ᑲᑐᔾᔨᖃᑎᒌᖏᑦ

IIBA Inuit Impact and Benefit Agreement
ᐃᓄᐃᑦ ᐊᒃᑐᖅᑕᐅᓂᐊᕐᓂᖏᓐᓄᑦ ᐃᑲᔫᓯᐊᖅᑖᕈᓐᓇᐅᑎᖏᓐᓄᓪᓗ ᐊᖏᕈᑎᑦ

IOL Inuit Owned Land

ᐃᓄᐃᑦ ᓄᓇᖁᑎᖏᑦ

IPG Institution of Public Government

ᐃᓄᖕᓄᑦ ᒐᕙᒪᖃᕐᕕᒃ

IR Information Request

ᑐᓴᖅᑎᑕᐅᕆᐊᒃᑲᓐᓂᕈᒪᔾᔪᑦ

KIA Kivalliq Inuit Association

ᑭᕙᓪᓕᕐᒥ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᑦ

LSA Local Study Area

ᓄᓇᓕᐅᑉ ᖃᓂᒋᔮᓂ ᖃᐅᔨᓴᕐᕕᐅᔪᖅ

ML Metal Leaching

ᓴᕕᕋᔾᔭᒃᓴᐃᑦ ᕿᓂᖅᑎᓇᕙᓪᓕᐊᓂᖏᑦ

MT Million tonnes

ᒥᓕᐊᓐ ᑕᓐᓴ

Mt/a Million tonnes per annum (year)

ᒥᓕᐊᓐ ᑕᓐᓴ ᐊᕐᕌᒍᓕᒫᖅ

NGMP Nunavut General Monitoring Program

ᓄᓇᕘᒥ ᑭᓯᑐᐃᓐᓇᕐᓂᒃ ᓱᓐᓂᖅᑐᖅᑲᖅᐸᓪᓕᐊᓕᖕᒋᒃᑲᓗᐊᓇᐊᖓᓐᓂᒃ ᖃᐅᔨᒋᐊᖅᑲᑦᑕᕐᓂᖅ

NIRB Nunavut Impact Review Board

ᓄᓇᕘᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ

NLCA Nunavut Land Claims Agreement

ᓄᓇᕗᒻᒥ ᓄᓇᑖᕐᓂᕐᒧᑦ ᐊᖏᕈᑎᑦ

NNLP No Net Loss Plan

ᐃᖃᓗᒃᑕᓖᑦ ᐊᒃᑐᖅᑕᐅᓯᒪᖃᓯᐅᔾᔭᐅᖁᓇᒋᑦ ᓄᑖᓄᑦ ᐱᓕᕆᐊᕆᔭᐅᓂᐊᖅᑐᓄᑦ ᐸᕐᓇᐅᑦ

NPC Nunavut Planning Commission

ᓄᓇᕗᒻᒥ ᐸᕐᓇᐃᔩᑦ

NRCan Natural Resources Canada

ᑲᓇᑕᒥ ᓄᓇᒥᐅᑕᓕᕆᔩᑦ

NTI Nunavut Tunngavik Incorporated

ᓄᓇᕗᑦ ᑐᙵᕕᒃ ᐃᓐᑯᐊᐳᕆᑎᑦ

NWB Nunavut Water Board

ᓄᓇᕘᒥ ᐃᒪᓕᕆᔩᑦ ᑲᑎᒪᔨᖏᑦ

NWMB Nunavut Wildlife Management Board

ᓄᓇᕗᒻᒥ ᐆᒪᔪᓕᕆᔨᕐᔪᐊᑦ ᑲᑎᒪᔨᖏᑦ

PC Parks Canada

ᑲᓇᑕᒥ ᒥᙳᐃᖅᓯᕐᕕᓕᕆᔩᑦ

PHC Preliminary Hearing Conference

ᐃᓄᒋᐊᒃᑎᓪᓗᒍ ᐃᓄᐃᑦ ᑲᑎᒪᑎᑕᐅᓂᐊᓵᕐᓂᖕᒋᓐᓂᒃ ᑲᑎᒪᓂᖅ

QIA Qikiqtani Inuit Association

ᕿᑭᖅᑕᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᖕᒋᑦ

RSA — Regional Study Area
ᓄᓇᓖᑦ ᐊᕕᒃᑐᖅᓯᒪᐅᕐᓂᖓᓐᓂ ᖃᐅᔨᓴᕐᕕᐅᔪᖅ

SARA — Species at Risk Act
ᐆᒪᔪᑦ ᐊᑦᑕᓇᖅᑐᒃᑰᓕᒫᔪᓄᑦ ᒪᓕᒐᖅᔪᐊᖅ

SEMC — Socio-Economic Monitoring Committee
ᐃᓄᓕᕆᓂᖅ -ᐱᕙᓪᓕᐊᔪᓕᕆᓂᕐᒨᖓᔪᓪᓗ ᓱᓐᓂᖅᑐᖃᖅᐸᓪᓕᐊᓕᙱᒃᑲᓗᐊᕆᐊᖓᓂᒃ ᖃᐅᔨᕆᐊᖃᑦᑕᕐᓂᖏᓐᓄᑦ ᑲᑎᒪᔨᕋᓛᑦ

TC — Transport Canada
ᑲᓇᑕᒥ ᐃᖏᕐᕋᔪᓕᕆᔩᑦ

TDS — Total Dissolved Solids
ᓯᑎᔪᕕᓃᑦ ᐊᐅᒃᓯᒪᔪᑦ ᑲᑎᓪᓗᒋᑦ

TK — Traditional Knowledge
ᐃᓄᖕᓄᑦ ᖃᐅᔨᒪᔭᐅᔪᑦ

VEC — Valued Ecosystem Component
ᐆᒪᔪᓐᓇᖅᑐᓕᒫᑦ ᐊᕙᑎᖏᓪᓗ ᐃᓄᖕᓄᑦ ᐱᒻᒪᕆᒋᔭᐅᔪᑦ

VSEC — Valued Socio-Economic Component
ᐃᓄᓕᕆᓂᖅ -ᐱᕙᓪᓕᐊᔪᓕᕆᓂᕐᒨᖓᔪᓪᓗ ᐃᓄᖕᓄᑦ ᐱᒻᒪᕆᒋᔭᐅᔪᑦ

Ministre des Affaires autochtones
et du développement du Nord

Minister of Aboriginal Affairs and
Northern Development

Ottawa, Canada K1A 0H4

DEC 03 2012

Ms. Elizabeth Copland
Chairperson
Nunavut Impact Review Board
PO BOX 1360
CAMBRIDGE BAY NU X0B 0C0

Dear Ms. Copland:

Thank you for your letter of September 14, 2012, transmitting the Final Hearing Report for the Mary River Project and for the errata issued on October 24, 2012, and November 26, 2012, (collectively, the Report). I appreciate the Board's diligence in this matter.

The Nunavut Impact Review Board has completed its review of the Project, and has determined that the Project should proceed subject to 182 terms and conditions.

The Ministers of Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada, Transport Canada and I, have jurisdictional responsibility for authorizing the proposal to proceed. We have reviewed the Report and pursuant to Section 12.5.7(a) of the Nunavut Land Claims Agreement, and we accept the Report and the Board's determination that the Proposal should proceed subject to the terms and conditions set out in the Report. We have concluded that the Report contains a thorough assessment of both ecosystemic and socio-economic issues. Furthermore, it is evident that the Board met its primary objectives as required under Section 12.2.5, to protect and promote the existing and future well-being of the residents and communities of Nunavut, to protect the ecosystemic integrity of the Nunavut Settlement Area and take into account the well-being of residents of Canada outside the Nunavut Settlement Area.

My colleagues and I would like to point out that there are terms and conditions such as 101, 174 and 177, among others, that will require clarification at the Project Certificate Workshop but we are confident that these can be dealt with at that time.

.../2

The responsible Ministers would like to acknowledge the success and hard work of the Board for its thorough review of this Proposal.

Sincerely,

John Duncan, PC, MP

c.c.: The Honourable Keith Ashfield, PC, MP
The Honourable Peter Kent, PC, MP
The Honourable Denis Lebel, PC, MP
The Honourable Joe Oliver, PC, MP
The Honourable James Arreak, MLA
The Honourable Peter Taptuna, MLA
Ms. Cathy Towtongie, President, Nunavut Tunngavik Incorporated
Ms. Okalik Eegeesiak, President, Qikiqtani Inuit Association
Mr. Jobie Tukkiapik, President, Makivik Corporation
Mr. Tom Paddon, President and CEO, Baffinland Iron Mines Corporation

NIRB File No.: 08MN053
AANDC File No.: N2008T0014
QIA File No.: LUA-2008-008
DFO File No.: 2008 MR
NWB File No.: 2AM - MRY

December 28, 2012

Tom Paddon, President
Baffinland Iron Mines Corporation
Suite 1016, 120 Adelaide Street West
Toronto, ON M5H 1T1

Sent via email: tom.paddon@baffinland.com

Re: <u>NIRB Project Certificate No. 005 for Baffinland Iron Mines Corp.'s Mary River Project</u>

Dear Mr. Tom Paddon:

Pursuant to Section 12.5.12 of the Nunavut Land Claims Agreement (NLCA), the Nunavut Impact Review Board (NIRB or Board) is pleased to issue the enclosed Project Certificate No. 005 for the Mary River Project to Baffinland Iron Mines Corporation (Baffinland).

The NIRB would like to thank all parties who provided input regarding planned implementation of terms and conditions from the NIRB's Final Hearing Report and clarification required for the December 14, 2012 *draft* Project Certificate prior to finalization by the Board. Following the review of written comment submissions and through the scheduling of a project certificate workshop in Iqaluit December 18-19, 2012, for the information of all parties the NIRB has produced a companion document to the Project Certificate which identifies changes made from the draft circulated on December 14, 2012.

The NIRB's role is now to monitor the Mary River Project in accordance with Part 7 of the NLCA and the Board intends to appoint Monitoring Officers as required to monitor the Project in accordance with the enclosed Project Certificate terms and conditions. The NIRB's Monitoring Officers will serve as the lead contact for the NIRB on any project-specific coordination with other agencies as may be required.

The NIRB will now commence development of the framework for a project-specific monitoring program which, once complete will be included as Appendix A to the Project Certificate. Please note that this framework cannot be issued in final form until key regulatory authorizations,

including land use permits, water licences, mineral leases, etc. are issued so that the monitoring program supplements and supports but does not duplicate the monitoring requirements in regulatory and land use instruments.

The NIRB expects to have its technical staff participate through the remaining steps of the NWB's Type A water licensing process as well as other relevant licensing or permitting processes, including attending meetings and hearings as scheduled. The NIRB's technical staff will continue to be available to provide clarification regarding whether or not specific items have been addressed through the NIRB Review, and can assist with locating relevant information related to the Mary River Project from the NIRB's public registry.

By copy of this correspondence, the NIRB wishes to notify the Nunavut Planning Commission (NPC) that the Project Certificate for the Mary River Project has now been issued; the NIRB understands that the NPC may now proceed with its consideration of Baffinland's application to amend the North Baffin Regional Land Use Plan to allow for construction of the railway corridor proposed for the Mary River Project.

The NIRB looks forward to working with Baffinland and all parties to ensure that the enclosed Project Certificate is fully implemented and achieves the identified objectives. If you have any questions or require clarification regarding the attached documents, please contact the NIRB's Executive Director, Ryan Barry at 867-983-4608 or rbarry@nirb.ca.

Sincerely,

Elizabeth Copland
Chairperson
Nunavut Impact Review Board

cc: Erik Madsen, Baffinland Iron Mines Corporation
Sharon Ehaloak, Nunavut Planning Commission
Damien Côté, Nunavut Water Board
Stephen Williamson-Bathory, Qikiqtani Inuit Association
Paul Suvega, Government of Nunavut
Robin Aitken, Aboriginal Affairs and Northern Development Canada
Luc Fortin, Canadian Transportation Agency
Mark Dahl, Environment Canada
Derrick Moggy, Fisheries and Oceans Canada
Rob Johnstone, Natural Resources Canada
Meighan Andrews, Transport Canada
Mary River Distribution List

Enclosed: NIRB Project Certificate No. 005 (NIRB File No. 08MN053)
Draft NIRB Project Certificate No. 005 with clarification highlighted (NIRB File No. 08MN053)

In the matter of the
Nunavut Land Claims Agreement,
Nunavut Land Claims Agreement Act, S.C., 1993, c. 29
Article 12, Part 5

And

In the matter of an application by
Baffinland Iron Mines Corporation
for development of the
Mary River Project Proposal
in the
Qikiqtani Region of Nunavut

NIRB PROJECT CERTIFICATE [NO.: 005]

December 28, 2012

1.0 BACKGROUND

Whereas:

A. Pursuant to the *Nunavut Land Claims Agreement* (NLCA), the Nunavut Impact Review Board (Board or NIRB) has completed a review of the potential ecosystemic and socio-economic effects of the Mary River Project Proposal, NIRB No. 08MN053 (Mary River Project or Project);

B. The Board has considered the list of commitments made by Baffinland Iron Mines Corporation (Baffinland or the Proponent) throughout the NIRB's review and during the NIRB Final Hearing for the Project and the Board has every expectation that the Proponent will fulfill the commitments made during the Final Hearing, within its Final Environmental Impact Statement and contained within supporting documentation submitted during the review of the Project, not just the commitments that are expressly included as terms and conditions in this Project Certificate;

C. The Board has determined, pursuant to Section 12.5.5 of Article 12 of the NLCA, that, taking into account the implementation of the measures necessary to prevent or mitigate the potential adverse environmental and socio-economic effects associated with the Project and set out as terms and conditions in this Project Certificate, the Mary River Project is not likely to cause significant adverse ecosystemic and socio-economic effects;

D. The Board has found, pursuant to Section 12.5.5 of Article 12 of the NLCA and taking into account all matters relevant to its mandate including Section 12.2.5, that the Mary River Project will enhance and protect the existing and future well being of the residents and communities of the Nunavut Settlement Area;

E. The Minister of Aboriginal Affairs and Northern Development Canada has accepted the NIRB Final Hearing Report for the Mary River Project (September 2012), and the recommended terms and conditions contained in the Report that are now included in the Project Certificate; and

F. Recognizing the importance of co-ordination, integration and avoiding duplication with other monitoring requirements in permits, licences and other authorizations, the project-specific monitoring program, provided as Appendix A to this Project Certificate, will be issued in final form after key regulatory authorizations, including land use permits, water licences and mineral leases, are issued .

Now therefore, the Nunavut Impact Review Board pursuant to Section 12.5.12 of Article 12 of the Nunavut Land Claims Agreement, issues this Project Certificate for the Mary River Project to Baffinland Iron Mines Corporation, subject to the terms and conditions contained herein.

2.0 PROJECT DESCRIPTION

The Mary River Project (the Project) consists of mining iron ore from the reserve at Deposit No. 1 at a nominal production rate of 18 Million tons per year (Mt/a). The Project includes the extended exploration, construction, operation, closure, and reclamation of an open-pit mine and associated infrastructure for extraction, transportation and shipment of iron ore. There are 3 main project locations – the mine site, Milne Port north of the mine site, and Steensby Port south of the mine site. Milne Port is connected to the mine site by the Milne Inlet Tote road, approximately 100 kilometers (km) in length. A

Railway of approximately 150 kilometers (km) will be constructed to connect the Mine Site to Steensby Port.[1] For the construction period, supplies and equipment required for construction at the Mine Site and the northern portion of the Railway will be received through Milne Port. Likewise, construction equipment and supplies for Steensby Port and the southern portion of the Railway will be received at Steensby Port.

It is expected that Steensby Port facilities and the Railway will take up to four years to construct. During construction, supplies will be brought to both Milne Port and Steensby Port during the open water season. Once the Railway is operational, 18 Mt/a of iron ore will be transported by Railway and shipped from Steensby Port. Shipping of iron ore will occur year round and will require vessels with icebreaking capabilities. When Steensby Port is operational, Milne Port will only be used occasionally for the delivery of oversized equipment for the Mine Site. The main destination for the iron ore is European steel makers.[2]

3.0 IMPLEMENTATION

This Project Certificate is implemented by authorizing agencies in accordance with the reviewability section of the NLCA (Section 12.9.7):

> "A licence, permit, certificate or other governmental approval which implements or incorporates any term or condition of a NIRB project certificate may not be called into question in a court of law on the grounds that the issuing agency thereby fettered its discretion or otherwise acted without jurisdiction, when implementing any term or condition of a NIRB project certificate."

If the Qikiqtani Inuit Association or other Designated Inuit Organization, or person or body that would normally have standing has concerns that any term or condition is not being implemented, these parties may seek a determination before the appropriate court regarding whether or not the terms and conditions in the project certificate have been implemented.[3]

3.1 Overview of NIRB Monitoring Program

As set out in Sections 12.7.1 and 12.7.2 of Article 12 of the NLCA the NIRB has the jurisdiction to establish a project-specific monitoring program to: measure the ecosystemic and socioeconomic effects of a project; assess whether the project is in compliance with the prescribed project terms and conditions; share information with regulatory agencies to support the enforcement of land, water or resource use approvals and agreements; and to assess the accuracy of predictions contained in the environmental impact statements. Given the Board's application of the precautionary approach to several aspects of the assessment for this Project, in the Board's view project-specific monitoring will

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[1] The proposed alignment of the Railway was provided as an exhibit at the Final Hearing; see NIRB Final Hearing File No.: 08MN053, Exhibit #3, Cover Letter and Map book From Baffinland to the Nunavut Planning Commission With Respect to the Mary River Railway Corridor On Inuit Lands, Baffinland Iron Mines Corporation, filed by Baffinland on July 16, 2012.

[2] For a more detailed description of the Project, see the Project Description as provided in the Final Environmental Impact Statement filed by Baffinland Iron Mines Corporation, NIRB File No.: 08MN053, February 14, 2012.

[3] See Section 12.10.5 of the NLCA

play a crucial role in addressing the uncertainty regarding project effects and enabling all parties to adapt mitigation measures on an ongoing basis to ensure the Project's negative effects are prevented or limited to the extent possible.

The role of the Board with respect to the establishment of monitoring programs is to focus the terms and conditions in relation to the Project. With respect to existing or future general regional and territorial monitoring programs that may include some of the same monitoring parameters/indicators as the project-specific monitoring program, the NLCA also directs the NIRB to avoid duplication but facilitate co-ordination and integration between the project-specific monitoring programs required by the NIRB and more general programs and initiatives such as the Nunavut General Monitoring Plan.[4] Where the requirements of regional or territorial programs are more extensive or substantively different than those established through the Project Certificate, at all times the Proponent must ensure compliance with the Project Certificate terms and conditions.

In order to co-ordinate, integrate and avoid duplication with other monitoring programs, but also to ensure that the NIRB's project-specific monitoring program yields the information required to measure effects and adequately assess compliance with terms, conditions, regulatory instruments and agreements, the NIRB's monitoring program will continue to be developed through consultation with responsible authorities, the resource and land owners and the proponent as the remaining regulatory instruments for the Project are developed. Following the issuance of the Project Certificate by the NIRB, the framework for a project-specific monitoring program will be developed and will be provided in draft form as Appendix A to the Project Certificate. As noted in the Preamble, this framework cannot be issued in final form until key regulatory authorizations, including land use permits, water licences, mineral leases, etc. are issued so that the monitoring program supplements and supports but does not duplicate the monitoring requirements in regulatory and land use instruments. Prior to finalization, the Proponent will be required to comply with all aspects of the draft framework as directed by the NIRB.

3.2 General Principles of Interpretation Applicable to Terms and Conditions:

In order to view the project-specific terms and conditions set out within this Project Certificate in the appropriate context, the following general principles of interpretation apply to the Project Certificate in its entirety, with all terms and conditions being interpreted in accordance with:

a. The NIRB's Final Hearing Report (namely NIRB File No.: 08MN053, Final Hearing Report for the Mary River Project Proposal, September 14, 2012 available from the NIRB's registry);
b. The rights, responsibilities, authorities and jurisdiction granted under the Nunavut Land Claims Agreement (NLCA);
c. The limits and obligations imposed under laws of general application applicable to the Proponent or any party referred to in the term and condition, as those laws may be amended over time (e.g. privacy legislation, worker's health and safety, etc.);
d. The specific jurisdictional and policy limits applicable to authorizing agencies, Nunavut Tunngavik Incorporated, the Qikiqtani Inuit Association, or other regulatory authority with jurisdiction in respect of the Project;

[4] See the discussion in Section 5.10.3 of the report and Sections 12.7.4 and 12.7.5 of the NLCA.

e. Where terms and conditions include specific references to items that must be taken into consideration or included in work plans, etc. these specific references are intended to establish minimum expectations but are not intended to limit the Proponent or prevent the Proponent from undertaking additional measures beyond those expressly prescribed in such terms and conditions; and

f. As noted in the Final Hearing Report, for those items where a more stringent version of the precautionary principle has been applied, it is the Board's expectation that the adaptive management strategies chosen will be highly responsive to early warning signs that risks may materialize, and that rather than waiting for impacts to be noted before mitigation measures are triggered, thresholds and triggers will be set to require responses long before adverse impacts are likely.

3.3 Format of Terms and Conditions:

Wherever possible, the NIRB has used the following format for the project-specific terms and conditions set out within this Project Certificate, so as to provide clear direction on the intended application, objectives and reporting requirements:

Category: Identifies the relevant environmental component or project activity to which the term and condition applies. Wherever possible categories have been labelled so as to directly associate back to the Final Environmental Impact Statement and Environmental Impact Statement Guidelines prepared for the Project.

Responsible Parties: Identifies the parties responsible for implementation of the term and condition. While this is generally the Proponent, at times other agencies have been implicated as appropriate.

Project Phase: Identifies the phase(s) of Project development to which the term and condition is applicable. Project phase may include any one or more of the following:

- Construction – includes site preparation and staging of materials and equipment in advance of construction
- Operations
- Temporary Closure /Care and Maintenance
- Closure and Post-Closure Monitoring – includes abandonment, decommissioning and reclamation

Objective: Provides a short description of the impact or effect being mitigated. Where relevant, expectiations regarding the timing for when terms and conditions will be deemed to be satisifed (i.e. sunset clause), who has discretion for determining it is satisfied has been provided.

Term or Condition: Provides specific direction on the required action or follow up. In most instances the NIRB has endeavoured to use generalized wording to allow for maximum flexibility in achieving the stated objective, however more explicit direction has been provided where deemed necessary.

Reporting Requirements: Sets out any specific reporting parameters required to measure achievement of objectives or to demonstrate compliance, as well as the required frequency of reporting.

Consideration will be given to coordination of Project Certificate reporting requirements with reporting requirements as established by other regulatory instruments associated with the Project.

It should be noted that, for some of the recommended terms and conditions, a non-binding **Commentary** section has also been added following the specific term and condition as an aid to interpretation. The Commentary section reflects clarification of the term and condition, recording the common understanding and interpretation resulting from discussions and guidance provided at the Project Certificate Workshop held in Iqaluit on December 18-19, 2012. The Commentary section is offered as a reference only and is not legally binding; in the event of a conflict between the wording in the Project Certificate and the clarification provided in the Commentary, the express wording of the Project Certificate prevails.

3.4 Flexibility

It is acknowledged that the NIRB's monitoring program will have varying requirements over the course of the Project lifecycle, and that monitoring requirements will apply from construction to eventual abandonment and reclamation. In areas where there may be a need for flexibility in relation to the terms and conditions of the Project Certificate or their application, the NIRB has endeavoured to reflect this in the associated language and/or acknowledge that objectives may be achieved through various means.

The NIRB retains the ability to give additional clarification or direction on an ongoing basis through its Monitoring Officer, with respect to compliance requirements for the Project. Upon request by the Proponent or other parties, the NIRB can provide additional clarification or direction regarding implementation of Project Certificate terms and conditions.

Where the objective of a Project Certificate term or condition can be achieved through more efficient alternate means, the Proponent is encouraged to consult with the NIRB (and other parties as required) to seek acceptance of proposed alternatives.

The NIRB has the authority to reconsider the terms and conditions of the Project Certificate to ensure that the terms and conditions are achieving their purpose. Clearly the NIRB expects the Proponent to meet its obligations under this Project Certificate, however, the NIRB may revisit the Project Certificate if the NIRB determines that the terms and conditions are not achieving their purpose. In the event that the monitoring program needs to be modified to better achieve its purpose, the Board, the Proponent, the Designated Inuit Organization or other interested parties may cause the Board, under Section 12.8.2 of the NLCA to revisit the monitoring program, or any other terms and conditions in the Project Certificate.

3.5 Enforcement

As noted in Section 12.10.3, where the terms and conditions of the Project Certificate are implemented or incorporated by reference into permits, certificates, licences or other governmental approvals, the enforcement of the terms and conditions included in that authorization remains with the agency responsible for the authorization (i.e. Authorizing Agency). In addition, under Part 8, Article 12 of the NLCA, if the Board determines that these terms and conditions are not achieving their purpose for any

reason, including instances of significant non-compliance, the NIRB may revisit the terms and conditions contained in the Project Certificate.

3.6 Proponent Commitments

A listing of commitments confirmed by the parties at the Final Hearing was provided within the NIRB's Final Hearing Report for the Project as Appendix A.[5] Although some of these commitments have provided the basis for the terms and conditions set out in the Project Certificate, others, due to various reasons, such as limits on the NIRB's jurisdiction, have not been expressly included as terms and conditions in the Project Certificate. However, as noted in the Preamble to the Certificate, even for those commitments that are not included in the Project Certificate, recognizing the importance of honouring commitments to the credibility of the Board's assessment process, it is the Board's expectation that **all parties** will make best efforts to fulfill the commitments referenced in the Final Hearing, including the listing provided as Exhibit #64[6] and the listing in Appendix A: Table of Commitments attached to the Final Hearing Report.

To support transparency and accountability associated with the Proponent's commitments, the Board requests that the Proponent provide, in an annual report to the NIRB, a summary of the status of the Proponent's progress with respect to meeting the commitments set out in Appendix A of the Final Hearing Report.

4.0 PROJECT-SPECIFIC TERMS AND CONDITIONS

4.1 General

NIRB Monitoring Responsibilities

1. The NIRB will appoint Monitoring Officers as required to monitor the Project in accordance with the purpose of a monitoring program as set out in section 12.7.2 of the Nunavut Land Claims Agreement for the full life of the Project, including closure and restoration. Subject to direction from the NIRB, the responsibilities of the NIRB Monitoring Officers will include:
    a. Providing direction to the Proponent, the Terrestrial and Marine Environment Working Groups, regulatory agencies, and the Qikiqtaaluk Socio-Economic Monitoring Committee to supply NIRB with reports and information respecting the Project's operations, impacts and the implementation of mitigative measures;
    b. Conducting a periodic evaluation of the monitoring program for the Project;

[5] NIRB File No.: 08MN053, Final Hearing Report for the Mary River Project Proposal, September 14, 2012, Appendix A: Table of Commitments from the Final Hearing, at pp. A-1-A-20.
[6] NIRB Final Hearing File No.: 08MN053, Exhibit 64, Baffinland Iron Mines Corporation, Commitments made in response to recommendations of the Government of Nunavut, Pond Inlet, July 28, 2012, filed by Baffinland on July 28, 2012.

c. Compiling a report on the adequacy of the monitoring program and on the ecosystemic and socio-economic impacts of the Project; and

d. Where appropriate, recommending to the NIRB reconsideration of Project Certificate Terms and Conditions in accordance with section 12.8.2 of the Nunavut Land Claims Agreement.

2. The NIRB will report annually (in English and Inuktitut) on the results of its Monitoring Program for the Project.
3. The NIRB will schedule periodic updates regarding its Monitoring Program for the communities most affected by the Project.
4. The NIRB Monitoring Officers will schedule periodic site inspections at the Project, coordinating with other regulatory agencies to the extent possible.

General Regulatory Requirements

5. The Proponent must obtain all required federal and territorial permits and other approvals, and shall comply with the requirements of such regulatory instruments.
6. The Proponent shall take prompt and appropriate action to remedy any occasion of non-compliance with environmental laws and regulations and/or regulatory instruments, and shall report any non-compliance as required by law immediately. A description of all instances of non-compliance and associated follow up is to be reported annually to the NIRB.
7. The Proponent shall meet with respective licensing authorities prior to the commencement of construction to discuss the posting of adequate performance bonding. Licensing authorities are encouraged to take every measure to require that sufficient security is posted before construction begins.

Monitoring Records

8. All monitoring information collected pursuant to the Project Certificate and various regulatory requirements for the Project shall contain the following information:
    a. The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations;
    b. The date, time and place of sampling or measurement, and weather conditions;
    c. The date of analysis;
    d. The name of the person(s) who performed the analysis including any relevant accreditations;
    e. A description of the analytical methods or techniques used; and
    f. A discussion of the results of any analysis.
9. The Proponent shall make its monitoring results available, to the fullest extent possible, in English and Inuktitut.
10. The Proponent shall keep and maintain the records, including results, of all Project-related monitoring data and analysis for the life of the Project, including closure and post-closure monitoring.

11. The Proponent shall maintain the Final Environmental Impact Statement and the Environmental Effects Monitoring program developed for the Project, with predictions updated as new baseline data is collected.
12. The Proponent shall establish a Project-specific web portal or web page as a means of making all non-confidential monitoring and reporting information associated with the Project available to the general public. This does not limit what the Proponent may be required to submit to the NIRB or other regulatory authorities to meet reporting requirements.

4.2 Ecosystemic Terms and Conditions

Meteorology and Climate (including Climate Change)

Term and Condition No.	**1**
Category:	Meterology and Climate – Climate Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To provide feedback on the impacts that climate change might be having on the port facilities.
Term or Condition:	The Proponent shall use GPS monitoring or a similar means of monitoring at both port sites and will also use tide gauges at the Steensby Port site to monitor the relative sea levels and storm surges at these sites.
Reporting Requirements:	The Proponent shall summarize and supply these monitoring results to NIRB in the annual project report.

Term and Condition No.	**2**
Category:	Meterology and Climate – Climate Change Validation and Studies
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide feedback on the impacts that climate change might be having on the Project.
Term or Condition:	The Proponent shall provide the results of any new or revised assessments and studies done to validate and update climate change impact predictions for the Project and the effects of the Project on climate change in the Local Study Area and Regional Study Area as defined in the Proponent's Final Environmental Impact Statement.
Reporting Requirements:	The Proponent shall provide new or revised assessments and studies to the NIRB, the affected communities, relevant regulatory authorities, and interested parties.

Term and Condition No.	**3**
Category:	Meterology and Climate – Green House Gas Emissions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To confirm that the Proponent is exploring and implementing concrete steps to reduce greenhouse gases.
Term or Condition:	The Proponent shall provide interested parties with evidence of continued initiatives undertaken to reduce greenhouse gas emissions.
Reporting Requirements:	The Proponent shall include relevant information in the Annual Report submitted to the NIRB.

Term and Condition No.	**4**
Category:	Climate Change – Consultation on Climate
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To promote public awareness and engagement of affected groups.
Term or Condition:	The Proponent shall endeavour to include the participation of Inuit from affected communities and other communities in Nunavut when undertaking climate-change related studies and research.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**5**
Category:	Meteorology and Climate – Weather Monitoring Data
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide families of employees with up to date information.
Term or Condition:	The Proponent shall endeavour to explore and implement reasonable measures to ensure that weather-related information for the various Project sites is readily accessable to the public on a continual basis throughout the life of the Project
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**6**
Category:	Meteorology and Climate – Emissions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide feedback on the Project's emissions.
Term or Condition:	The Proponent shall provide the results of any emissions calculations

	conducted to determine the level of sulphur dioxide (SO_2) emissions, nitrogen oxide (NO_X) emissions and greenhouse gases generated by the Project using fuel consumption or other relevant criteria as a basis.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

Air Quality

Term and Condition No.	**7**
Category:	Air Quality – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To provide feedback on the Project's emissions.
Term or Condition:	The Proponent shall update its Air Quality and Noise Abatement Management Plan to include an expanded regional study area and provide for land-based monitoring stations designed to capture operations phase ship-generated SO_2 and NO_2 emissions through Foxe Basin and along the Hudson Strait.
Reporting Requirements:	The updated plan shall be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Commentary: *It is anticipated that continuous monitoring rather than passive monitoring will be required at the land-based monitoring stations to identify if hourly exceedances occur.*

Term and Condition No.	**8**
Category:	Air Quality – Greenhouse Gas Emissions
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To provide feedback on the Project's emissions.
Term or Condition:	The Proponent shall demonstrate through monitoring of air quality at the mine site and at the Steensby Inlet Port site that SO_2 and NO_2 emissions remain within predicted levels and, where applicable, within limits established by all applicable guidelines and regulations. In cases where exceedances are manifested, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

Term and Condition No.	**9**
Category:	Air Quality – Greenhouse Gas Emissions
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To provide feedback on the Project's emissions.

Term or Condition:	The Proponent shall provide calculations of greenhouse gas emissions generated by activities at the Steensby Inlet port and other Project sources including aircraft associated with the Project. Calculations shall take into consideration, fuel consumption as measured by Baffinland's purchase and use as well as the fuel use of its contractors and sub-contractors.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.

Term and Condition No.	**10**
Category:	Air Quality –Dust Managemement and Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To prevent impacts to air quality form dust dispersion.
Term or Condition:	The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items: a) Outline the specific plans for monitoring dust along the first few kilometres of the rail corridor leaving the Mary River mine site. b) Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from trains transporting along the rail route is greater than initially predicted.
Reporting Requirements:	To be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**11**
Category:	Air Quality – Incineration Management Plan
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to air quality from incineration activities.
Term or Condition:	The Proponent shall develop and implement an Incineration Management Plan that takes into consideration the recommendations provided in Environment Canada's Technical Document for Batch Waste Incineration (2010).
Reporting Requirements:	Updated Incineration Management Plan to be provided to the NIRB at least 60 days prior to the commencement of construction activities.

Term and Condition No.	**12**
Category:	Air Quality – Incineration
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to air quality from incineration activities.
Term or Condition:	Prior to commencing any incineration of on-site Project wastes, the Proponent shall conduct at least one stack test immediately following the commissioning of each temporary and permanent incinerator.

Reporting Requirements:	Stack test results to be reported to the NIRB and Environment Canada annually as required.

Noise and Vibration

Term and Condition No.	**13**
Category:	Noise and Vibration-Use of Exposives
Responsible Parties:	The Proponent, Fisheries and Oceans Canada
Project Phase:	Construction
Objective:	To determine appropriate protection of fish and aquatic life in the Arctic.
Term or Condition:	The Proponent is encouraged to work with Fisheries and Oceans Canada at the regulatory phase and to take a precautionary approach when selecting the overpressure threshold to be applied to explosives use for the protection of fish and aquatic life.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**14**
Category:	Noise and Vibration- Noise and Vibration Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate noise and vibration at Project sites, especially living areas.
Term or Condition:	The Proponent shall conduct noise and vibration monitoring at Project accommodations sites located at the Mary River mine site, Steensby Inlet Port site, and Milne Inlet Port site. Sampling shall be undertaken during the summer and winter months during all phases of Project development.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

Term and Condition No.	**15**
Category:	Noise and Vibration- Noise and Vibration Monitoring
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, local Hamlet organizations
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enhance public safety when travelling around the Project area.
Term or Condition:	The Proponent shall collaborate to the extent possible with the Qikiqtani Inuit Association and local Hamlet organizations when undertaking consultation with all affected communities regarding railway operations. During these consultations, it is recommended that the Proponent provide information including video, audio, and photographic representation as well as any other aids (i.e. models) that may enhance the general public's understanding of railway operations, as well as all safety considerations for members of the public who may be travelling around the project area.

Reporting Requirements:	To be developed following approval of the Project by the Minister.

Hydrology and Hydrogeology

Term and Condition No.	**16**
Category:	Hydrology and Hydrogeolgy – Water Infrastructure
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To provide assurance that the potential impacts to flow and quantity of water in the Project area are minimized.
Term or Condition:	The Proponent shall ensure that the water related infrastructure or facilities that are designed and constructed, including the modification of culverts, diversion of watercourses, and diversion of runoff into watercourses along the railway, access roads, the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied advance of constructing those facilities.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *It is understood that the term "consistent with those proposed in the FEIS" requires general consistency only in relation to the type, location and scope of this infrastructure and facilities, but does not limit the ability of the Proponent to refine and optimize the design, placement and construction as may become necessary to reflect site-specific conditions encountered during construction.*

Term and Condition No.	**17**
Category:	Hydrology and Hydrogeology – Effluent Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to water bodies from effluent.
Term or Condition:	The Proponent shall develop and implement effectives measures to ensure that effluent from project-related facilities and/or activities, including sewage treatment plants, ore stockpiles, and mine pit, satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**18**
Category:	Hydrology and Hydrogeology – Pit Lake Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring

Objective:	To enhance predictions for mine site closure conditions.
Term or Condition:	The Proponent shall carry out continued analyses over time to confirm and update, accordingly, the approximate fill time for the mine pit lake identified in the FEIS.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**19**
Category:	Hydrology and Hydrogeology – Water Infrastructure Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to natural water flow.
Term or Condition:	The Proponent shall ensure that it develops and implements adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, the Proponent shall monitor, document and report the withdrawal rates for water removed and utilized for all domestic and industrial purposes.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Groundwater/Surface Waters

Term and Condition No.	**20**
Category:	Groundwater/Surface Waters - Explosives
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the areas surrounding the Project.
Term or Condition:	The Proponent shall monitor the effects of explosives residue and related by-products from project-related blasting activities as well as develop and implement effective preventative and/or mitigation measures, including treatment, if necessary, to ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the Project and surrounding areas.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**21**
Category:	Groundwater/Surface Waters – Aquatic Effects Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Construction

Objective:	To mitigate potential impacts to surface and ground waters.
Term or Condition:	The Proponent shall ensure that the scope of the Aquatic Effects Monitoring Plan (AEMP) includes, at a minimum, monitoring of non-point sources of discharge, selection of appropriate reference sites, measures to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**22**
Category:	Groundwater/Surface Waters – Sediment and Erosion Management Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To develop appropriate sediment and erosion controls to prevent impacts to surface waters.
Term or Condition:	The Proponent shall develop a detailed Sediment and Erosion Management Plan to prevent and/or mitigate sediment loading into surface water within the Project area.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**23**
Category:	Groundwater/Surface Waters – Groundwater Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to groundwater quality.
Term or Condition:	The Proponent shall develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and/or mitigate the potential effects of the Project on groundwater within the Project area.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	**24**
Category:	Groundwater/Surface Waters – Effluent Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to groundwater and surface waters from effluent discharge.
Term or Condition:	The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carry out treatment if necessary to ensure that discharge conditions are met at all times.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Landforms, Geology and Geomorphology, Soils and Permafrost

Term and Condition No.	25
Category:	Landforms – Additional Geotechnical Investigations
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to sensitive landforms.
Term or Condition:	The Proponent shall undertake the additional geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure, develop and implement preventative and/or mitigation and monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	26
Category:	Landforms and Soils – Erosion Management Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To develop appropriate measures for preventing destabilization and erosion.
Term or Condition:	The Proponent shall develop and implement a comprehensive erosion management plan to prevent or minimize the effects of destabilization and erosion that may occur due to the Project's construction and operation.
Reporting Requirements:	Plan to be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Term and Condition No.	27
Category:	Landforms, Geology and Geomorphology – Natural Aesthitics
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to natural aesthetics.
Term or Condition:	The Proponent shall include within its public consultation report information related to the sentiments expressed by affected communities about the impacts that changes to the topography and landscape have had on the aesthetic value of the Project area.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	28
Category:	Landforms, Geology and Geomorphology – Permafrost
Responsible Parties:	The Proponent

Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure that permafrost integrity is maintained.
Term or Condition:	The Proponent shall monitor the effects of the Project on the permafrost along the railway and all other Project affected areas and must implement effective preventative measures to ensure that the integrity of the permafrost is maintained.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**29**
Category:	Landforms, Geology and Geomorphology – Design Plans
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To confirm constructed components meet design as assessed.
Term or Condition:	The Proponent shall provide to the respective regulatory authorities, for review and acceptance, for-construction engineering design and drawings, specifications and engineering analysis to support design in advance for constructing those facilities. Once project facilities are constructed, the Proponent shall provide copies of the as-built drawings and design to the appropriate regulatory authorities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Commentary: *"Acceptance" by a regulatory authority of for-construction engineering design and drawings, specifications and engineering analysis merely indicates that the authority has received the documentation but does not imply that the authority has approved the design, drawings, specifications or analysis received.*

Term and Condition No.	**30**
Category:	Landforms, Geology and Geomorphology – Quarries
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To provide oversight on quarry design and management.
Term or Condition:	The Proponent shall develop site-specific quarry operation and management plans in advance of the development of any potential quarry site or borrow pit.
Reporting Requirements:	Plans to be provided to the NIRB for review and comment at least 30 days prior to commencement of construction activities.

Vegetation

Term and Condition No.	31
Category:	Vegetation – Construction and Operations
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To minimize impacts to vegetation.
Term or Condition:	The Proponent shall ensure that Project activities are planned and conducted in such a way as to minimize the Project footprint.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	32
Category:	Vegetation – Construction and Operations
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent introduction of invasive species.
Term or Condition:	The Proponent shall ensure that equipment and supplies brought to the Project sites are clean and free of soils that could contain plant seeds not naturally occurring in the area. Vehicle tires and treads in particular must be inspected prior to initial use in Project areas.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	33
Category:	Vegetation – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To facilitate monitoring.
Term or Condition:	The Proponent shall include relevant Monitoring and Management Plans within its Environmental Management System, Terrestrial Environment Management and Monitoring Plan (TEMMP).
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB .

Term and Condition No.	34
Category:	Vegetation – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To determine baseline metal levels of soils used by berry-producing plants.
Term or Condition:	The Proponent shall conduct soil sampling to determine metal levels of soils

	in areas with berry-producing plants near any of the potential development areas, prior to commencing operations.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**35**
Category:	Vegetation – Monitoring
Responsible Parties:	The Proponent, local Hunters and Trappers Organizations
Project Phase:	Construction and Operations
Objective:	To determine baseline metal levels in foraging caribou.
Term or Condition:	The Proponent shall undertake monitoring of baseline metal levels in organ tissue from caribou harvested within the local study area, prior to commencing operations. The Proponent is strongly encouraged to coordinate with local Hunters and Trappers Organizations regarding procurement of harvested caribou organs.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Commentary: *It is anticipated that the Terrestrial Environment Working Group members will provide guidance to the Proponent on the specific tissues studied, the methods for testing and mechanics of obtaining samples.*

Term and Condition No.	**36**
Category:	Vegetation – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations
Objective:	To monitor for project-induced effects to foraging caribou.
Term or Condition:	The Proponent shall establish an on-going monitoring program for vegetation species used as caribou forage (such as lichens) near Project development areas, prior to commencing operations.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB .

Term and Condition No.	**37**
Category:	Vegetation – Monitoring
Responsible Parties:	The Proponent, Government of Nunavut Department of Environment
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent establishment of invasive species.
Term or Condition:	The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. Any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	38
Category:	Vegetation – Adaptive Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to vegetation abundance, diversity and health.
Term or Condition:	The Proponent shall review, on an annual basis, all monitoring information and the vegetation mitigation and management plans developed under its Environmental Management System, Terrestrial Environment and Monitoring Plan (TEMMP) and adjust such plans as may be required to effectively prevent or reduce the potential for significant adverse project effects on vegetation abundance, diversity and health.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB .

Term and Condition No.	39
Category:	Vegetation – Reclamation and Revegetation
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent erosion and promote progressive revegetation of disturbed areas.
Term or Condition:	The Proponent shall develop a progressive revegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test plots, reseeding and replanting of native plants as necessary. It is further recommended that this program be directly associated with the management plans for erosion control established for the Project.
Reporting Requirements:	To be provided to the NIRB for review and comment at least 60 days prior to commencement of construction activities.

Commentary: *It is understood that revegetation may not be possible for all those areas disturbed by project development, and that the requirements of progressive revegetation are in relation to only those "disturbed areas" that had vegetative cover prior to project development.*

Term and Condition No.	40
Category:	Vegetation – Reclamation and Revegetation
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent erosion and promote progressive revegetation of disturbed areas.
Term or Condition:	The Proponent shall include revegetation strategies in its Site Reclamation Plan that support progressive reclamation and that promote natural

	revegetation and recovery of disturbed areas compatible with the surrounding natural environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *It is understood that revegetation may not be possible for all those areas disturbed by project development, and that the requirements of progressive revegetation are in relation to only those "disturbed areas" that had vegetative cover prior to project development.*

Freshwater Aquatic Environment including Biota and Habitat

Term and Condition No.	**41**
Category:	Freshwater Aquatic Environment – Setbacks
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts of runoff into freshwater aquatic habitat.
Term or Condition:	Unless otherwise approved by regulatory authorities, the Proponent shall maintain a minimum 100-metre naturally-vegetated buffer between the high-water mark of any fish-bearing water bodies and any permanent quarries with potential for acid rock drainage or metal leaching.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**42**
Category:	Freshwater Aquatic Environment – Setbacks
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts of runoff into freshwater aquatic habitat.
Term or Condition:	The Proponent shall maintain minimum a 30-metre naturally-vegetated buffer between the mining operation and adjacent water bodies.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *As used in the above Term and Condition, "mining operation" is intended to include the site of active ore removal, including excavations resulting from the extraction of ore but does not include quarries, transportation corridors or other mine infrastructure.*

Term and Condition No.	**43**
Category:	Freshwater Aquatic Environment – Drainage
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts of runoff into freshwater aquatic habitat.
Term or Condition:	Prior to the start of construction, the Proponent must submit a Site

	Drainage and Silt Control Plan to the appropriate regulatory authorities for approval.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**44**
Category:	Freshwater Aquatic Environment – Explosives
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts of explosives on freshwater aquatic habitat.
Term or Condition:	The Proponent shall meet or exceed the guidelines set by Fisheries and Oceans Canada for blasting thresholds and implement practical and effective measures to ensure that residue and by-products of blasting do not negatively affect fish and fish habitat.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**45**
Category:	Freshwater Aquatic Environment – General
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to freshwater aquatic habitat.
Term or Condition:	The Proponent shall adhere to the No-Net-Loss principle at all phases of the project to prevent or mitigate direct or indirect fish and fish habitat losses.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**46**
Category:	Freshwater Aquatic Environment – Drainage
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to freshwater aquatic habitat.
Term or Condition:	The Proponent shall ensure that runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities responsible for generating liquid effluent and runoff meet discharge requirements.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**47**
Category:	Freshwater Aquatic Environment – Watercourses
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent blockages or restrictions to fish passage.

Term or Condition:	The Proponent shall ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and limit the movement of water in fish bearing streams and rivers.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**48**
Category:	Freshwater Aquatic Environment – Explosives
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Fisheries and Oceans Canada
Project Phase:	Construction, Operations
Objective:	To mitigate impacts to freshwater aquatic habitat.
Term or Condition:	The Proponent shall engage with Fisheries and Oceans Canada and the Qikiqtani Inuit Association in exploring possible Project specific thresholds for blasting that would exceed the requirements of Fisheries and Oceans Canada's *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (*D.G. Wright and G.E. Hopky, 1998).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Terrestrial Wildlife and Habitat

Term and Condition No.	**49**
Category:	Terrestrial Wildlife and Wildlife Habitat – Terrestrial Environment Working Group
Responsible Parties:	The Proponent, the Qikiqtani Inuit Association, the Government of Nunavut, Environment Canada, and any other agencies or interested parties as determined by the members to be appropriate
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	The TEWG will provide direction and guidance to the Proponent regarding: adding to baseline information during construction and before project operations commence; monitoring and reporting regarding effects occurring during operations; and providing advice regarding changes that may be required to make sure the management of negative impacts is effective and that lasting damage is prevented.
Term or Condition:	The Proponent shall establish a Terrestrial Environment Working Group ("TEWG") which will act as an advisory group in connection with mitigation measures for the protection of the terrestrial environment and in connection with its Environmental Effects Monitoring Program, as it pertains to the terrestrial environment. Members may consider the draft terms of reference for the TEWG filed in the Final Hearing, but they are not bound by them. The role of the TEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	50
Category:	Terrestrial Wildlife and Habitat - General
Responsible Parties:	The Proponent and other Parties as appropriate
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure appropriate and responsive adaptive management.
Term or Condition:	The Proponent shall continue to develop and implement Project-specific monitoring for the terrestrial environment, and will demonstrate appropriate refinements to design, incorporation of analytical methods and elaboration of methodologies. The monitoring plan shall contain clear thresholds to allow for the assessment of long-term trends and cumulative effects where project interactions are identified. Coordination and cooperation will be required where data collection, analysis and interpretation, or responsibility for mitigation and management requires the efforts of multiple parties (e.g., government, Qikiqtani Inuit Association, communities).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	51
Category:	Terrestrial Wildlife and Habitat - General
Responsible Parties:	The Proponent and/or TWEG
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To promote coordination of monitoring efforts.
Term or Condition:	The Proponent, either directly or as part of the TEWG, shall consider and, where appropriate, cooperate with relevant regional and/or community-based monitoring initiatives that raise issues or produce information pertinent to mitigating project-induced impacts.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	52
Category:	Terrestrial Wildlife and Habitat - Caribou
Responsible Parties:	The Proponent, TEWG
Project Phase:	Construction
Objective:	To ensure best practices are used for caribou protection.
Term or Condition:	Within 3 months of issuance of the Project Certificate, the Proponent shall initiate design, and develop the timeline to test and implement means of deterring caribou from pits and other hazardous areas. A review of best practices and techniques will be undertaken at other Northern mines where interactions with caribou occur. Considerations should include temporary ribbon placement, inuksuks, or fencing and subsequent monitoring for effectiveness. These activities shall be reported back to the Terrestrial Environment Working Group.
Reporting Requirements:	To be developed following approval of the Project by the Minister; results to

	be reported back to the Terrestrial Environment Working Group.

Term and Condition No.	**53**
Category:	Terrestrial Wildlife and Habitat - Caribou
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to caribou from Project-related traffic.
Term or Condition:	The Proponent shall demonstrate consideration for the following: a. Steps taken to prevent caribou mortality and injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads. b. Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times. c. Evaluation of the effectiveness of proposed caribou crossings over the railway, Milne Inlet tote road and access roads as well as the appropriate number. d. Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded. e. Protocols for documentation and reporting of all caribou collisions and mortalities, as well as mechanisms for adaptive management responses designed to prevent further such interactions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**54**
Category:	Terrestrial Wildlife and Habitat - Caribou
Responsible Parties:	The Proponent
Project Phase:	Construction – within six (6) months of issuance of Project Certificate
Objective:	To Update the Terrestrial Environmental Managment and Monitoring Plan
Term or Condition:	The Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include, but not be limited to the following: a. Details of the methods and rationale for conducting monitoring prior to the commencement of construction; b. Monitoring for caribou presence and behavior during railway construction; c. Description and justification of statistical design or other means of determining effect and proposed analyses to support the conclusions drawn from monitoring impacts of the mine and related infrastructure on wildlife; d. Details of monitoring and mitigation activities, including: i. Dust fall (fugitive and Total Suspended Particulates), that

	addresses methods to reduce risk to caribou forage from dust fall; ii. Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway. Using the result of this information, an early warning system for caribou on the railway shall be developed for operation. e. Details of monitoring thresholds related to level of mitigation and management; and f. Details of a comprehensive hunter harvest survey to determine the effect on caribou populations and potential effects on caribou behaviour resulting from increased human access caused by upgrades to the Milne Inlet tote road (and any other roads if they are shifted from private to public use) and increase local knowledge of the mine site, including establishing pre-construction baseline harvesting data.
Reporting Requirements:	Plan to be submitted to the NIRB and the TEWG within 6 months of issuance of a Project Certificate.

Term and Condition No.	**55**
Category:	Terrestrial Wildlife and Habitat - Wolves
Responsible Parties:	The Proponent, Government of Nunavut Department of Environment
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate potential impacts to wolves.
Term or Condition:	The Proponent shall develop an adaptive management plan applicable to wolves and wolf habitat in collaboration with the Government of Nunavut-Department of Environment (GN-DOE) to ensure compliance with the *Nunavut Wildlife Act.* Consideration must be given to the following: a. Monitoring for active wolf dens within a 10 km radius from the mine site, under the direction and prior approval of the GN DOE, and reporting the results through NIRB's Annual Reports on terrestrial wildlife in the Potential Development Area (PDA); b. Estimating the available (glacio-fluvial materials) esker habitat within the Regional Study Area/PDA and identifying such habitat as ecologically sensitive; c. Developing "wolf indices" for presence/abundance of wolves (by conducting studies) to set a baseline pre-construction baseline; and d. Ensuring that wolf monitoring is capable of determining the relative abundance and distribution of wolves in the Project Development Area over time.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**56**
Category:	Terrestrial Wildlife and Habitat – Wildlife Habitat

Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure progressive reclamation of disturbed wildlife habitat.
Term or Condition:	The Proponent shall develop a strategy for the recovery of terrestrial wildlife habitat in a progressive manner that is consistent with the *Nunavut Wildlife Act*. Overall, this will require the integration of a decision-making process and the identification of mitigation responses to cumulative impacts on caribou survival, breeding propensity, and population dynamics.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**57**
Category:	Terrestrial Wildlife and Habitat - Reporting
Responsible Parties:	The Proponent
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate and monitor for impacts to wildlife.
Term or Condition:	The Proponent shall report annually regarding its terrestrial environment monitoring efforts, with inclusion of the following information: a. Description of all updates to terrestrial ecosystem baseline data; b. A description of the involvement of Inuit in the monitoring program; c. An explanation of the annual results relative to the scale of the natural variability of Valued Ecosystem Components in the region, as described in the baseline report; d. A detailed presentation and analysis of the distribution relative to mine structures and activities for caribou and other terrestrial mammals observed during the surveys and incidental sightings; e. Results of the annual monitoring program, including field methodologies and statistical approaches used to support conclusions drawn; f. A summary of the chronology and level of mine activities (such as vehicle frequency and type); g. An assessment and presentation of annual environmental conditions including timing of snowmelt, green-up, as well as standard weather summaries; and h. A discussion of any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

Term and Condition No.	**58**
Category:	Terrestrial Wildlife and Habitat - Reporting
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring

Objective:	To mitigate and monitor for impacts to wildlife.
Term or Condition:	Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes: a. An examination for trends in the measured natural variability of Valued Ecosystem Components in the region relative to the baseline reporting; b. A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway; c. A description of the extent of dust fall based on measured levels of dust fall (fugitive and finer particles such as TSP) on lichens and blueberries, and ash content of caribou fecal pellets; d. A demonstration and description of how the monitoring results contribute to cumulative effects of the project; e. Any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program; and f. Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the Qikiqtani Inuit Association and affected communities, and shall be circulated as new information becomes available.
Reporting Requirements:	To be included in the Annual Report submitted to the NIRB

Term and Condition No.	**59**
Category:	Terrestrial Wildlife and Habitat – Aircraft Disturbances
Responsible Parties:	The Proponent
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate aircraft disturbance to wildlife.
Term or Condition:	The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point to point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise prescribed by the Working Group) and use flight corridors to avoid areas of significant wildlife importance.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *As indicated in the heading and discussion of this section in the Final Hearing Report, the intention of this section is to mitigate aircraft disturbance to wildlife, (including, but not limited to migratory birds, although these are specifically mentioned in the term and condition). It is also anticipated that the Terrestrial Environment Working Group may provide the Proponent with additional*

direction regarding minimum flight altitude requirements that may differ from these requirements. It is also noted that Term and Condition #71 prescribes a slightly more stringent minimum altitude for migratory birds and unless the Terrestrial Environment Working Group provides additional direction, the minimums set out in Condition #71 will govern with respect to migratory birds specifically.

Term and Condition No.	**60**
Category:	Terrestrial Wildlife and Habitat – Explosives
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate impacts to wildlife from explosives.
Term or Condition:	Prior to construction, the Proponent shall develop a detailed blasting program to minimize the effects of blasting on terrestrial wildlife that includes, but is not limited to the restriction of blasting when migrating caribou, sensitive local carnivores or birds may be negatively affected.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**61**
Category:	Terrestrial Wildlife and Habitat – Operations (General)
Responsible Parties:	The Proponent, TEWG
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate Project impacts to wildlife.
Term or Condition:	Whenever practical and not causing a human safety issue, a stop work policy shall be implemented when wildlife in the area may be endangered by the work being carried out. An operational definition of 'endangered' shall be provided by the Terrestrial Environment Working Group.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**62**
Category:	Terrestrial Wildlife and Habitat – Operations (General)
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent increased harvesting pressure on wildlife.
Term or Condition:	The Proponent shall prohibit project employees from transporting firearms to site and from operating firearms in project areas for the purpose of wildlife harvesting.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**63**
Category:	Terrestrial Wildlife and Habitat – Public Engagement
Responsible Parties:	The Proponent, local Hunters and Trappers Organizations
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance,

	Closure and Post-Closure Monitoring
Objective:	To keep communities up to date with Project operations.
Term or Condition:	The Proponent shall liaise with local Hunters and Trappers Organizations in advance of carrying out terrestrial wildlife surveys. At a minimum, The Proponent shall also meet annually in person with Hunters and Trappers Organizations to discuss wildlife monitoring and mitigation plans and address community concerns regarding wildlife interactions. The Proponent may be required to facilitate these meetings through payment of honoraria and meeting costs.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**64**
Category:	Terrestrial Wildlife and Habitat – Waste Management
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent human-carnivore interactions.
Term or Condition:	The Proponent shall ensure that its Environment Protection Plan incorporates waste management provisions to prevent carnivores from being attracted to the Project site(s). Consideration must be given to the following measures: a. Installation of an incinerator beside the kitchen that will help to keep the food waste management process simple and will minimize the opportunity for human error (i.e. storage of garbage outside, hauling in a truck (odours remain in truck), hauling some distance to a landfill site, incomplete combustion at landfill, fencing of landfill, etc.); and b. Installation of solid carnivore-proof skirting on all kitchen and accommodation buildings (i.e., heavy-duty steel mesh that would drop down from the edge of the buildings/trailers and buried about a half meter into the ground to prevent animals from digging under the skirting).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *The use of the phrase "consideration must be given" requires that if the Proponent chooses not to implement the suggested measures, the Proponent must provide an indication of the rationale for not implementing the suggested measure and for choosing an alternative measure.*

Birds

Term and Condition No.	**65**
Category:	Birds – Awareness
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance,

	Closure and Post-Closure Monitoring
Objective:	To prevent disturbance to birds and bird habitat.
Term or Condition:	The Proponent shall ensure all employees working at project sites receive awareness training regarding the importance of avoiding known nests and nesting areas and large concentrations of foraging and moulting birds.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**66**
Category:	Birds – Species at Risk
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to sensitive bird species.
Term or Condition:	If Species at Risk or their nests and eggs are encountered during Project activities or monitoring programs, the primary mitigation measure must be avoidance. The Proponent shall establish clear zones of avoidance on the basis of the species-specific nest setback distances outlined in the Terrestrial Environment Management and Monitoring Plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**67**
Category:	Birds – Species at Risk
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to sensitive bird species.
Term or Condition:	The Proponent shall ensure that the mitigation and monitoring strategies developed for Species at Risk are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans and management plans that may become available during the duration of the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**68**
Category:	Birds – Project Infrastructure
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent potential injuries to birds.
Term or Condition:	The Proponent shall ensure flashing red, red strobe or white strobe lights and guy-wire deterrents are used on communications towers established for the Project. Consideration should also be given to reducing lighting when possible in areas where it may serve as an attractant to birds or other wildlife.

Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *The first sentence in the above term and condition refers to the use of appropriate lighting to make communications and guy-wires visible to birds to ensure birds can avoid such obstacles, while the second sentence indicates that in <u>other circumstances,</u> where lighting of project areas could serve as an attractant to birds or other wildlife, consideration should be given to reducing such lighting.*

Term and Condition No.	**69**
Category:	Birds – Construction/Clearing Activities
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent nesting by birds in active Project areas.
Term or Condition:	Prior to bird migrations and commencement of nesting, the Proponent shall identify and install nesting deterrents (e.g. flagging) to discourage birds from nesting in areas likely to be disturbed by construction/clearing activities taking place during the nesting season.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**70**
Category:	Birds – Construction/Clearing Activities
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to birds and nesting areas.
Term or Condition:	The Proponent shall protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in its Terrestrial Environment Mitigation and Monitoring Plan, until the young have fledged. If it is determined that observance of these setbacks is not feasible, the Proponent will develop nest-specific guidelines and procedures to ensure bird's nests and their young are protected.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**71**
Category:	Birds – Flight Altitude Requirements
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate aircraft disturbance to birds.
Term or Condition:	Subject to safety requirements, the Proponent shall require all project related aircraft to maintain a cruising altitude of at least: a. 650 m during point to point travel when in areas likely to have migratory birds b. 1100 m vertical and 1500 m horizontal distance from observed

	concentrations of migratory birds c. 1100 m over the area identified as a key site for moulting snow geese during the moulting period (July-August), and if maintaining this altitude is not possible, maintain a lateral distance of at least at least 1500 m from the boundary of this site.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *As noted under the Commentary in Term and Condition #59 the Terrestrial Environment Working Group may provide the Proponent with additional direction regarding minimum flight altitude requirements that may differ from these requirements, but unless the Terrestrial Environment Working Group provides additional direction, the minimum flight altitudes set out above will govern with respect to migratory birds specifically.*

Term and Condition No.	**72**
Category:	Birds – Flight Altitute Requirements
Responsible Parties:	The Proponent, Transport Canada
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate aircraft disturbance to birds.
Term or Condition:	The Proponent shall ensure that pilots are informed of minimum cruising altitude guidelines and that a daily log or record of flight paths and cruising altitudes of aircraft within all Project Areas is maintained and made available for regulatory authorities such as Transport Canada to monitor adherence and to follow up on complaints.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**73**
Category:	Birds – Monitoring
Responsible Parties:	The Proponent, Qikiqtani Inuit Organization, TEWG, MEWG
Project Phase:	Construction, Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To develop appropriate mitigation and monitoring of impacts to birds.
Term or Condition:	The Proponent shall develop detailed and robust mitigation and monitoring plans for migratory birds, reflecting input from relevant agencies, the Qikiqtani Inuit Organization and communities as part of the Terrestrial Environment Working Group and to the extent applicable the Marine Environment Working Group.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**74**
Category:	Birds – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring

Objective:	To develop appropriate mitigation and monitoring of impacts to birds.
Term or Condition:	The Proponent shall continue to develop and update relevant monitoring and management plans for migratory birds under the Proponent's Environmental Management System, Terrestrial Environment Mitigation and Monitoring Plan prior to construction. The key indicators for follow up monitoring under this plan will include: peregrine falcon, gyrfalcon, common and king eider, red knot, seabird migration and wintering, and songbird and shorebird diversity.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**75**
Category:	Birds – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assess the extent of terrestrial habitat loss.
Term or Condition:	The Proponent's monitoring program shall assess and report, on annual basis, the extent of terrestrial habitat loss due to the Project to verify impact predictions and provide updated estimates of the total project footprint.
Reporting Requirements:	To be provided within the Annual Report to the NIRB.

Marine Environment, Marine Water/Ice and Sediment Quality

Term and Condition No.	**76**
Category:	Marine Environment – General
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate potential impacts to the marine environment.
Term or Condition:	The Proponent shall develop a comprehensive Environmental Effects Monitoring Program to address concerns and indentify potential impacts of the Project on the marine environment.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**77**
Category:	Marine Environment – Working Group
Responsible Parties:	The Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and interested parties.
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	The MEWG will consult with, and provide advice and recommendations to the Proponent in connection with mitigation measures for the protection of

	the marine environment, monitoring of effects on the marine environment and the consideration of adaptive management plans. The role of the MEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.
Term or Condition:	A Marine Environment Working Group ("MEWG") shall be established to serve as an advisory group in connection with mitigation measures for the protection of the marine environment, and in connection with the Project Environmental Effects Monitoring program, as it pertains to the marine environment. Membership on the MEWG will include the Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and other agencies or interested parties as determined to be appropriate by these key members. Makivik Corporation shall also be entitled to membership on the MEWG at its election. The MEWG members may consider the draft terms of reference for the MEWG filed in the Final Hearing, but they are not bound by them.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**78**
Category:	Marine Environment – Ice Breaking and Shipping
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To obtain accurate and current ice information.
Term or Condition:	The Proponent shall update the baseline information for landfast ice using a long-term dataset (28 years), and with information on inter-annual variation. The analysis for pack and landfast ice shall be updated annually using annual sea ice data (floe size, cover, concentration) and synthesized and reported in the most appropriate management plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *The annual update for pack and landfast ice includes not only identification of naturally-occurring effects, but also must include information on effects on floe size, cover and concentration of pack and landfast ice that may be attributed to icebreaking activities.*

Term and Condition No.	**79**
Category:	Marine Environment – Ice Breaking and Shipping
Responsible Parties:	The Proponent, Canadian Hydrographic Services
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assist in the development of nautical charts for Canadian waters.
Term or Condition:	The Proponent shall provide the Canadian Hydrographic Services with bathymetric data and other relevant information collected in support of Project shipping where possible, to assist in the development of nautical charts for Canadian waters.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	80
Category:	Marine Environment – Ice Breaking and Shipping
Responsible Parties:	The Proponent, Canadian Hydrographic Services
Project Phase:	Construction
Objective:	To identify areas of risk along the shipping route.
Term or Condition:	Prior to commercial shipping of iron ore, the Proponent shall conduct a detailed risk assessment for Project-related shipping accidents, noting areas along the ship tracks where vessels may be particularly vulnerable to environmental conditions such as sea ice, and any seasonal differences in risk. This assessment shall inform mitigation and adaptive management plans.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	81
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To mitigate potential shoreline effects from shipping.
Term or Condition:	The Proponent shall reassess the potential for ship wake impacts to cause coastal change following any further changes to the proposed shipping routes.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	82
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To mitigate potential shoreline effects from shipping.
Term or Condition:	The Proponent is strongly encouraged to have its ore carriers subjected to sea trials to measure wake characteristics at various vessel speeds and distances from the vessel.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	83
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To monitor relative sea level and storm surges.
Term or Condition:	The Proponent shall install tidal gauges at the Steensby Inlet Port site to monitor relative sea level and storm surges.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	84

Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To prevent sediment redistribution along the shipping route.
Term or Condition:	The Proponent shall update its sediment redistribution modeling once ship design has been completed and sampling should be undertaken to validate the model and to inform sampling sites and the monitoring plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**85**
Category:	Marine Environment – Shoreline Effects and Sediment Redistribution
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To prevent sediment redistribution along the shipping route.
Term or Condition:	The Proponent shall develop a monitoring plan to verify its impact predictions associated with sediment redistribution resulting from propeller wash in shallow water locations along the shipping route. If monitoring detects negative impacts from sediment redistribution, additional mitigation measures will need to be developed and implemented.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**86**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To update ballast water discharge impact predictions.
Term or Condition:	Prior to commercial shipping of iron ore, the Proponent shall use more detailed bathymetry collected from Steensby Inlet to model the anticipated ballast water discharges from ore carriers. The results from this modeling shall be used to update ballast water discharge impact predictions and should account for density dependent flow and annual timescales over the project life. Additional sampling should also be undertaken to validate the model and to inform sampling sites and the monitoring plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**87**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent invasive species introductions resulting from Project shipping.
Term or Condition:	The Proponent shall develop a detailed monitoring program at a number of sites over the long term to evaluate changes to marine habitat and organisms and to monitor for non-native introductions resulting from Project-related shipping. This program needs to be able to detect changes

	that may have biological consequences and should be initiated several years prior to any ballast water discharge into Steensby Inlet to collect sufficient baseline data and should continue over the life of the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**88**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent invasive species introductions resulting from Project shipping.
Term or Condition:	Prior to commercial shipping of iron ore and in conjunction with the Marine Environment Working Group, the Proponent shall complete a risk analysis regarding ballast water discharge to assess the adequacy of treatment and implications on the receiving environment. This risk analysis shall consider, but not be limited to: a. Invasive species; b. Seasonal oceanography; c. Ballast water quality and quantity; d. Receiving water quality; and e. Residual physical, chemical, and/or biological effects.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**89**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine water quality resulting from ballast water exchange.
Term or Condition:	The Proponent shall develop and implement an effective ballast water management program that may include the treatment and monitoring of ballast water discharges in a manner consistent with applicable regulations and/or that may exceed the regulations if the regulations are determined to be ineffective for providing the desired and predicted results.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**90**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to marine water quality resulting from ballast water exchange.
Term or Condition:	The Proponent shall incorporate into its Shipping and Marine Mammals Management Plan provisions to achieve compliance with the requirements under the International Convention for the Control and Management of

	Ship's Ballast Water and Sediment (2004).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**91**
Category:	Marine Environment – Ballast Water
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to marine water quality in Steensby Inlet.
Term or Condition:	The Proponent shall develop a detailed monitoring plan for fouling that includes sampling areas on ships where antifouling treatment is not applied such as the areas where non-native species are most likely to occur.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**92**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure adequate spill response capacity.
Term or Condition:	The Proponent shall ensure that it maintains the necessary equipment and trained personnel to respond to all sizes of potential spills associated with the Project in a self sufficient manner.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**93**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment at Steensby Inlet.
Term or Condition:	Prior to construction, based on vessel selection and if so required, the Proponent shall reassess the risk analysis of using vessel-based fuel storage, including the potential environmental impacts of containment failure under a range of winter ice conditions, how a spill might spread and the impact of fuel if it does not volatilize to the atmosphere.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**94**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To promote public awareness of Project activities.
Term or Condition:	The Proponent shall consult directly with affected communities regarding its plans for over-wintering of fuel in Steensby Inlet, with discussion topics to

	include descriptions of the duration of proposed activities, vessel type, spill preparedness and emergency response protocols, environmental impact predictions and answers to community member questions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**95**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent, Transport Canada
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment at Steensby Inlet.
Term or Condition:	The Proponent shall meet or exceed all regulatory regulations and requirements as apply to the practice of overwintering a fuel vessel at Steensby Inlet, with reporting to the NIRB and Transport Canada.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**96**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To ensure adequate oversight of Project activities is occurring.
Term or Condition:	The Proponent will update the NIRB on the results of all compliance monitoring and site inspections undertaken by government agencies for the overwintering of a fuel vessel in Steensby Inlet.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**97**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment along the shipping route.
Term or Condition:	Prior to the commercial shipping of iron ore, the Proponent shall conduct fuel spill dispersion modeling that will, at a minimum, consider: a. Modeling of oil spills in the following areas: i. Pinch points, including: the mouth of Hudson Strait, the Resolution Island Area, the West End of Hudson Strait and Nottingham Island Area; ii. The approach into Steensby Inlet; iii. Shallow water and shorelines; and, iv. Areas that have been identified as having high flows and/or high concentrations of marine mammals, marine fish or seabirds. b. Open water and ice-covered conditions; c. Spill volumes up to and including loss of a full tanker cargo; and d. Differences in the quantity and properties of each type of bulk fuel transported by vessels when they are at, or in transit to, the port at

	Steensby Inlet.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**98**
Category:	Marine Environment – Spill Prevention
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to the marine environment along the shipping route.
Term or Condition:	The Proponent shall incorporate the results of revised fuel spill dispersion modeling into its impact predictions for the marine environment and its spill response and emergency preparedness plans.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Marine Wildlife and Marine Habitat

Term and Condition No.	**99**
Category:	Marine Environment – Supplemental Baseline Assessments
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction
Objective:	To supplement baseline information and improve predictions for potential impacts to marine wildlife.
Term or Condition:	The Proponent, working with the Marine Environment Working Group, shall consider and identify priorities for conducting the following supplemental baseline assessments: a. Establish an all-season, inter-annual baseline in Steensby Inlet that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. This shall include the selection and identification of physical, chemical, and biological community/indicator components. The biological indicators shall include both pelagic and benthic species but with emphasis on relatively sedentary benthic species (e.g. sculpins). b. The collection of additional baseline data in Steensby Inlet on walrus, beluga, bearded seal and anadromous Arctic Char abundance, distribution ecology and habitat use. c. Enhance baseline data on marine wildlife (fish, invertebrates, birds, mammals, etc.) and to provide more details on species abundance and distribution found in the Project area. This shall include, but not be limited to the following: i. Aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet and at appropriate control location; and ii. Shore-based observations of pre-Project narwhal behavior in Milne Inlet. d. Enhance the baseline for affected marine systems, which includes control sites to detect Project-related changes before they cause

	significant harm.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**100**
Category:	Marine Environment – Supplemental Baseline Assessments
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction
Objective:	To supplement baseline information and improve predictions for potential impacts to marine wildlife.
Term or Condition:	The Proponent shall update its Shipping and Marine Wildlife Management Plan, to include avoidance of polynyas and mitigation measures designed for potential fuel spills along the shipping lane during the winter months, with consideration for the impact of spilled fuel on marine mammals when they might be less mobile or able to avoid contact with spilt fuel or fumes.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**101**
Category:	Marine Environment – Monitoring
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction and Operations
Objective:	To monitor for potential impacts to marine wildlife and marine habitat.
Term or Condition:	The Proponent shall incorporate into the appropriate monitoring plans the following items: a. A monitoring program that focuses on walrus use of Steensby Inlet and their reaction to disturbance from construction activities, aircraft, and vessels; b. Efforts to involve Inuit in monitoring studies at all levels; c. Monitoring protocols that are responsive to Inuit concerns; d. Marine monitoring protocols are to consider the use of additional detecting devices to ensure adequate monitoring through changing seasonal conditions and daylight; e. Schedule for periodic aerial surveys as recommended by the Marine Environment Working Group; f. Periodic aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet, and a suitable control location. Surveys shall be conducted at an appropriate frequency to detect change inter-annual variability; g. Shore-based observations of pre-Project narwhal behavior in Milne Inlet; h. Conduct landfast ice monitoring for the duration of the Project Operations phase, which will include: i. The number of ship transits that are able to use the same track; and, ii. The area of landfast ice disrupted annually by ship traffic; and i. Monitoring strategy focused on assessing and mitigating interaction

	between humans and wildlife at the port site(s).
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**102**
Category:	Marine Environment – Traffic Log and Shipping Information
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To promote public awareness of Project shipping activities for the general public.
Term or Condition:	The Proponent shall ensure that routing of project vessels is tracked and recorded, with data made accessible in real time to communities in Nunavut and Nunavik. A summary of all ship tracks shall be submitted annually to the NIRB.
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**103**
Category:	Marine Environment – Traffic Log and Shipping Information
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor effectiveness of mitigation of shipping impacts to marine wildlife.
Term or Condition:	The Proponent shall report annually to the NIRB regarding project-related ship track and sea ice information, including: a. A record of all ship tracks taken along both shipping routes covering the entire shipping season; b. An overlay of ship tracks onto ice imagery to determine whether ships are effectively avoiding shore leads and polynyas; c. A comparison of recorded ship tracks to the expected nominal shipping route, and probable extent of year-round shipping during periods of ice cover and open-water; d. An assessment of the level of adherence to the nominal shipping route and the spatial extent of the shipping zone of influence; and e. Marine bird and mammal species and number of individuals attracted to ship tracks in ice.
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**104**
Category:	Marine Environment – Traffic Log and Shipping Information
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To prevent impacts to marine wildlife from Project shipping activities.
Term or Condition:	Subject to safety considerations and the potential for conditions as determined by the crew of transiting vessels, to result in route deviations, the Proponent shall require project vessels to maintain a route to the south

	of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island. Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors. The Proponent shall summarize all incidences of deviations from the nominal shipping route as presented in the FEIS to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**105**
Category:	Marine Environment – Traffic Log and Shipping Information
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To prevent impacts to marine wildlife from Project shipping activities.
Term or Condition:	The Proponent shall ensure that measures to reduce the potential for interaction with marine mammals, particularly in Hudson Strait, are identified and implemented prior to commencement of shipping operations. These measures could include, but are not limited to: a. Changes in the frequency and timing (including periodic suspensions) of shipping during winter months, i.e., when interactions with marine mammals are likely to be the most problematic; b. Reduced shipping speeds where ship-marine mammal interactions are most likely; and c. Identification of alternate shipping routes through Hudson Strait for use when conflicts between the proposed routes and marine mammals could arise. Repeated winter aerial survey results showing marine mammal distribution and densities in Hudson Strait would greatly assist in this task.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *Unless otherwise stated, the term "marine mammals" as used throughout the Project Certificate includes polar bears.*

Term and Condition No.	**106**
Category:	Marine Environment – Shipboard Observers
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure that interactions with marine mammals and Project shipping activities are effectively monitored.
Term or Condition:	The Proponent shall ensure that shipboard observers are employed through all seasons and provided with the means to effectively carry out assigned duties. The role of shipboard observers in shipping operations should be

	taken into consideration during the design of ore carriers, with climate controlled stations and shipboard lighting incorporated to permit visual sightings by shipboard observers during all seasons and conditions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**107**
Category:	Marine Environment – Shipboard Observers
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To ensure that interactions with marine mammals and Project shipping activities are effectively monitored.
Term or Condition:	The Proponent shall revise the proposed "surveillance monitoring" to improve the likelihood of detecting strong marine mammal responses occurring too far ahead of the ship to be detectable by observers aboard the ore carriers. A baseline study early in the shipping operations could employ additional surveillance to detect potential changes in distribution patterns and behavior. At an ambitious scope, this might be achieved using unmanned aircraft flown well ahead of ships, or over haul-out sites in the case of walruses.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**108**
Category:	Marine Environment – Shipboard Observers
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To ensure that interactions with marine mammals and Project shipping activities are effectively monitored.
Term or Condition:	The Proponent shall ensure that data produced by the surveillance monitoring program is analysed rigorously by experienced analysts (in addition to being discussed as proposed in the FEIS) to maximize their effectiveness in providing baseline information, and for detecting potential effects of the Project on marine mammals in the Regional Study Area. It is expected that data from the long-term monitoring program be treated with the same rigor.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**109**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	The Proponent shall conduct a monitoring program to confirm the predictions in the FEIS with respect to disturbance effects from ships noise on the distribution and occurrence of marine mammals. The survey shall be designed to address effects during all seasons of the year, and include

	locations in Hudson Strait and Foxe Basin. The survey shall continue over a sufficiently lengthy period to determine the extent to which acclimation occurs for narwhal, beluga, bowhead and walrus.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**110**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction and Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	The Proponent shall develop a monitoring protocol that includes, but is not limited to, acoustical monitoring, to facilitate assessment of the potential short term, long term, and cumulative effects of vessel noise on marine mammals and marine mammal populations. The Proponent is expected to work with the Marine Environment Working Group to determine appropriate early warning indicator(s) that will ensure rapid identification of negative impacts.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**111**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction and Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	The Proponent shall develop clear thresholds for determining if negative impacts as a result of vessel noise are occurring. Mitigation and adaptive management practices shall be developed to restrict negative impacts as a result of vessel noise. This shall include, but not be limited to: a. Identifications of zones where cumulative noise could be mitigated due to biophysical features (e.g., water depth, distance from migration routes, distance from overwintering areas etc.); and b. Vessel transit planning, for all seasons, to determine the degree to which cumulative sound impacts can be mitigated through the seasonal use of different zones.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**112**
Category:	Marine Environment – Ship Noise
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction and Operations
Objective:	To prevent impacts to marine mammals from Project shipping activities.
Term or Condition:	Prior to commercial shipping of iron ore, the Proponent, in conjunction with the Marine Environment Working Group, shall develop a monitoring protocol that includes, but is not limited to, acoustical monitoring that provides an assessment of the negative effects (short and long term

	cumulative) of vessel noise on marine mammals. Monitoring protocols will need to carefully consider the early warning indicator(s) that will be best examined to ensure rapid identification of negative impacts. Thresholds shall be developed to determine if negative impacts as a result of vessel noise are occurring. Mitigation and adaptive management practices shall be developed to restrict negative impacts as a result of vessel noise. This shall include, but not be limited to: a. Identification of zones where noise could be mitigated due to biophysical features (e.g., water depth, distance from migration routes, distance from overwintering areas etc.); b. Vessel transit planning, for all seasons. c. A monitoring and mitigation plan is to be developed, and approved by Fisheries and Oceans Canada prior to the commencement of blasting in marine areas.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**113**
Category:	Marine Environment – Arctic Char
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine fish in Steensby Inlet.
Term or Condition:	The Proponent shall conduct monitoring of marine fish and fish habitat, which includes but is not limited to, monitoring for Arctic Char stock size and health condition in Steensby Inlet, as recommended by the Marine Environment Working Group.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**114**
Category:	Marine Environment – Arctic Char
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine fish in Steensby Inlet.
Term or Condition:	In the event of the development of a commercial fishery in the Steensby Inlet area, the Proponent, in conjunction with the Marine Environment Working Group, shall update its monitoring program for marine fish and fish habitat to ensure that the ability to identify Arctic Char stock(s) potentially affected by Project activities and monitor for changes in stock size and structure of affected stocks and fish health (condition, taste) is maintained.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**115**
Category:	Marine Environment – Arctic Char
Responsible Parties:	The Proponent

Project Phase:	Construction and Operations
Objective:	To prevent impacts to marine fish in Steensby Inlet.
Term or Condition:	The Proponent is encouraged to continue to explore off-setting options in both the freshwater and marine environment to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**116**
Category:	Marine Environment – Blasting
Responsible Parties:	The Proponent, Fisheries and Oceans Canada
Project Phase:	Construction
Objective:	To prevent impacts to marine fish and fish habitat from explosives.
Term or Condition:	Prior to construction, the Proponent shall develop additional mitigation measures to minimize the effects of blasting on marine fish and fish habitat, marine water quality and wildlife that includes, but is not limited to compliance with the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by Fisheries and Oceans Canada for use in the North.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**117**
Category:	Marine Environment – Blasting
Responsible Parties:	The Proponent, Fisheries and Oceans Canada
Project Phase:	Construction
Objective:	To prevent impacts to marine fish and fish habitat from explosives.
Term or Condition:	The Proponent shall ensure that blasting in, and near, marine water shall only occur during periods of open water. Blasting in, and near, fish-bearing freshwaters shall, to the greatest degree possible, only occur in open water. If blasting is required during ice-covered periods, it must meet requirements established by Fisheries and Oceans Canada.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**118**
Category:	Marine Environment – Blasting
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To prevent impacts to marine fish and fish habitat from explosives.
Term or Condition:	The Proponent shall incorporate into the appropriate mitigation plan prior to construction, thresholds for the use of specific mitigation measures meant to prevent or limit marine wildlife disturbance, such as bubble curtains for blasting, and nitrate removal.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	119
Category:	Marine Environment – Ringed Seals
Responsible Parties:	The Proponent, Marine Environment Working Group
Project Phase:	Construction
Objective:	To prevent impacts to ringed seals from icebreaking associated with Project shipping.
Term or Condition:	The Proponent shall, in conjunction with the Marine Environment Working Group, monitor ringed seal birth lair abundance and distribution for at least two years prior to the start of icebreaking to develop a baseline, with continued monitoring over the life of the project as necessary to test the accuracy of the impact predictions and determine if mitigation is needed. Monitoring shall also include a control site outside of the Project's zone of influence.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	120
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals associated with Project shipping.
Term or Condition:	The Proponent shall ensure that, subject to vessel and human safety considerations, all project shipping adhere to the following mitigation procedures while in the vicinity of marine mammals: a. Wildlife will be given right of way; b. Ships will when possible, maintain a straight course and constant speed, avoiding erratic behavior; and c. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will implement appropriate measures to mitigate disturbance, including stoppage of movement until wildlife have moved away from the immediate area.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Commentary: *As noted previously, unless otherwise stated, the term "marine mammals" as used throughout the Project Certificate includes polar bears.*

Term and Condition No.	121
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent, Fisheries and Oceans Canada, Environment Canada
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and seabird colonies associated with Project shipping.
Term or Condition:	The Proponent shall immediately report any accidental contact by project vessels with marine mammals or seabird colonies to Fisheries and Oceans

	Canada and Environment Canada respectively, by notifying the appropriate regional office of the: a. Date, time and location of the incident; b. Species of marine mammal or seabird involved; c. Circumstances of the incident; d. Weather and sea conditions at the time; e. Observed state of the marine mammal or sea bird colony after the incident; and, f. Direction of travel of the marine mammal after the incident, to the extent that it can be determined.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**122**
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and seabird colonies associated with Project shipping.
Term or Condition:	The Proponent shall summarize and report annually to the NIRB regarding accidental contact by project vessels with marine mammals or seabird colonies through the applicable monitoring report.
Reporting Requirements:	To be provided in the Annual Report to the NIRB.

Term and Condition No.	**123**
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and seabird colonies associated with Project shipping.
Term or Condition:	The Proponent shall provide sufficient marine mammal observer coverage on project vessels to ensure that collisions with marine mammals and seabird colonies are observed and reported through the life of the Project. The marine wildlife observer protocol shall include, but not be limited to, protocols for marine mammals, seabirds, and environmental conditions and immediate reporting of significant observations to the ship masters of other vessels along the shipping route, as part of the adaptive management program to address any items that require immediate action.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**124**
Category:	Marine Environment – Marine Mammal Interactions
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance,

	Closure and Post-Closure Monitoring
Objective:	To prevent impacts to marine mammals and marine fish populations from increased harvesting pressures in Project areas.
Term or Condition:	The Proponent shall prohibit project employees from recreational boating, fishing, and harvesting of marine wildlife in project areas, including Steensby Inlet and Milne Inlet. The Proponent is not directed to interfere with harvesting by the public in or near project areas, however, enforcement of a general prohibition on harvesting in project areas by project employees during periods of active employment (i.e. while on site and between work shifts) is required.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**125**
Category:	Marine Environment – Public Engagement
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assess acceptability of acoustic deterrent devices for the general public.
Term or Condition:	Prior to use of acoustic deterrent devices, the Proponent shall carry out consultations with communities along the shipping route to assess the acceptability of these devices. Feedback received from community consultations shall be incorporated into the appropriate mitigation plan.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**126**
Category:	Marine Environment – Public Engagement
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To incorporate local input into monitoring data collection.
Term or Condition:	The Proponent shall design monitoring programs to ensure that local users of the marine area in communities along the shipping route have opportunity to be engaged throughout the life of the Project in assisting with monitoring and evaluating potential project-induced impacts and changes in marine mammal distributions.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**127**
Category:	Marine Environment – Public Engagement
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To promote public awareness and engagement with Project shipping activities.
Term or Condition:	The Proponent shall ensure that communities and groups in Nunavik are

	kept informed of project shipping activities and are provided with opportunity to participate in the continued development and refinement of shipping related monitoring and mitigation plans.
Reporting Requirements:	To be developed following approval of the Project by the Minister.

Term and Condition No.	**128**
Category:	Marine Environment – Public Engagement
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure habitat compensation is acceptable to local communities.
Term or Condition:	The Proponent shall consult with local communities as fish habitat off-setting options are being considered and demonstrate its incorporation of input received into the design of the Fish Habitat Off-Setting Plan required to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).
Reporting Requirements:	To be developed following approval of the Project by the Minister.

4.3 Socio-Economic Terms and Conditions

Population Demographics

Term and Condition No.	**129**
Category:	Population Demographics – Qikiqtaaluk Socio-Economic Monitoring Committee
Responsible Parties:	The Proponent, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Description of the general monitoring framework to be developed in consultation with the Qikiqtaaluk Socio-Economic Monitoring Committee.
Term or Condition:	The Proponent is strongly encouraged to engage in the work of the Qikiqtaaluk Socio-Economic Monitoring Committee along with other agencies and affected communities, and it should endeavour to identify areas of mutual interest and priorities for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the North Baffin region as a whole.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**130**
Category:	Population Demographics – Project-specific monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Recognizing that some Project-specific socio-economic monitoring

	initiatives may be best addressed in smaller more focused working groups, this is encouraged where possible.
Term or Condition:	The Proponent should consider establishing and coordinating with smaller socio-economic working groups to meet Project specific monitoring requirements throughout the life of the Project.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**131**
Category:	Population Demographics – Monitoring demographic changes
Responsible Parties:	The Proponent, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor demographic changes affecting the North Baffin communities and the territory as a whole in order to understand changes and to evaluate the Proponent's predictions as related to population demographics.
Term or Condition:	The Qikiqtaaluk Socio-Economic Monitoring Committee is encouraged to engage in the monitoring of demographic changes including the movement of people into and out of the North Baffin communities and the territory as a whole. This information may be used in conjunction with monitoring data obtained by the Proponent from recent hires and/or out-going employees in order to assess the potential effect the Project has on migration.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**132**
Category:	Population Demographics – Training programs
Responsible Parties:	The Proponent, North Baffin Hamlets, Municipal Training Organization, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To develop training programs in ways which contribute to limiting the potential for migration to occur as North Baffin residents seek training and employment opportunities in the larger centre of Iqaluit.
Term or Condition:	The Proponent is encouraged to partner with other agencies such as Hamlet organizations in the North Baffin region, the Municipal Training Organization, and the Government of Nunavut in order to adapt pre-existing, or to develop new programs which encourage Inuit to continue living in their home communities while seeking ongoing and progressive training and development. Programs may include driver training programs offered within Hamlets, providing upgraded equipment to communities for use in municipal works, providing incentives for small businesses to remain operating out of their community of origin, or supplementing existing recreational facilities and programming in North Baffin communities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	133
Category:	Population Demographics – Monitoring demographic changes
Responsible Parties:	The Proponent, members of QSEMC, Government of Nunavut, Nunavut Housing Corporation
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Training programs may be developed with the goal of limiting the potential for migration to occur as North Baffin residents may choose to seek employment and therefore move from smaller North Baffin communities to the larger centre of Iqaluit.
Term or Condition:	The Proponent is encouraged to work with the Qikiqtaaluk Socio-Economic Monitoring Committee and in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation and other relevant stakeholders, design and implement a voluntary survey to be completed by its employees on an annual basis in order to identify changes of address, housing status (i.e. public/social, privately owned/rented, government, etc.), and migration intentions while respecting confidentiality of all persons involved. The survey should be designed in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation and other relevant stakeholders. Non-confidential results of the survey are to be reported to the Government of Nunavut and the NIRB.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Commentary: *Although the survey design and implementation should be undertaken in consultation with the Government of Nunavut, the responsibility for design and implementation of the survey remains with the Proponent.*

Term and Condition No.	134
Category:	Population Demographics – Employee origin
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Project-specific information regarding employee origin is important to comparing predictions of labour availability and employment opportunities with actual levels of employment from various demographic segments over different geographic areas.
Term or Condition:	The Proponent shall include with its annual reporting to the NIRB a summation of employee origin information as follows: a. The number of Inuit and non-Inuit employees hired from each of the North Baffin communities, specifying the number from each; b. The number of Inuit and non-Inuit employees hired from each of the Kitikmeot and Kivalliq regions, specifying the number from each; c. The number of Inuit and non-Inuit employees hired from a southern location or other province/territory outside of Nunavut, specifying the locations and the number from each; and

	d. The number of non-Canadian foreign employees hired, specifying the locations and number from each foreign point of hire.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Education and Training

Term and Condition No.	**135**
Category:	Education and Training – Employee work/study programs
Responsible Parties:	The Proponent, Qikiqtani Inuit Association
Project Phase:	Construction and Operations
Objective:	Recognizing the 12-hour work days inherent with work at the Project site, it is not clear how employees would successfully engage in a work/study program offered by the Proponent.
Term or Condition:	The Proponent is encouraged to consider offering additional options for work/study programs available to Project employees (in addition to study programs at project sites that would be offered to employees when off shift).
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**136**
Category:	Education and Training – Transferable skills and training
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Government of Nunavut, Municipal Training Organization
Project Phase:	Construction and Operations
Objective:	Offering training which results in certifications that are valid for employment at more than one site or in different fields provides an investment in the long-term employability of Nunavummiut.
Term or Condition:	The Proponent is encouraged to work with training organizations and/or government departments offering mine-related or other training in order to provide additional opportunities for employees to gain meaningful and transferable skills, credentials and certifications especially where such training of employees offered by the Proponent remains valid only at the Mary River Project sites.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**137**
Category:	Education and Training – Transferable skills and training
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	Offering training which results in certifications that are valid for employment at more than one site or in different fields provides an investment in the long-term employability of Nunavummiut.
Term or Condition:	Prior to construction, the Proponent shall develop an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during employment at Mary River, such listing to

	indicate which of these certifications and licences would be transferable to a similar job site within Nunavut. This listing should be updated on an annual basis, and is to be provided to the NIRB upon completion and whenever it is revised.
Reporting Requirements:	The initial listing should be provided to the NIRB at least 60 days prior to the start of construction, an annually thereafter or as may otherwise be required.

Term and Condition No.	**138**
Category:	Education and Training – Inuit employee training
Responsible Parties:	The Proponent, Qikiqtani Inuit Association
Project Phase:	Construction
Objective:	Working together with the Qikiqtani Inuit Association to prepare effective training programs developed specifically for Inuit will assist in employee preparedness and may improve employee retention.
Term or Condition:	The Proponent is encouraged to work with the Qikiqtani Inuit Association to ensure the timely development of effective Inuit training and work-ready programs.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**139**
Category:	Education and Training – Hiring southern Canadians and foreign employees
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	With the unknown availability of labour from the North Baffin region and Nunavut as a whole to provide employment to the Project, the need to employ southern Canadians or foreign workers may implicate the Proponent's on-site language, cross-cultural awareness, and other programming. Having information available regarding the sourcing of labour for the Project is important to ensuring the Proponent and others are prepared for any influx of southern or foreign employees.
Term or Condition:	Prior to commencing construction, the Proponent is requested to undertake and provide the results of a detailed labour market analysis which provides quantitative predictions of the number of employees that may reasonably need to be sourced from southern Canada and from foreign markets, identifying where applicable, the country of origin for the foreign labour.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**140**
Category:	Education and Training – Survey of Nunavummiut employees
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	Monitoring the number of employees who leave previous employment in their home communities or who leave some type of formal education in pursuit of employment with the Project is important to evaluate predictions

	made and the potential impacts to North Baffin communities and education rates.
Term or Condition:	The Proponent is encouraged to survey Nunavummiut employees as they are hired and specifically note the level of education obtained and whether the incoming employee resigned from a previous job placement or educational institution in order to take up employment with the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**141**
Category:	Education and Training – Training of Inuit
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To ensure that effective training is available in a timely manner.
Term or Condition:	The Proponent is encouraged to work with the Qikiqtani Inuit Association prior to construction in order to prioritize the provision of training of Inuit to serve as employees in monitoring or other such capacities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Livelihood and Employment

Term and Condition No.	**142**
Category:	Livelihood and Employment – Employee cohesion
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To promote cohesion between employees on site, and between employees and their families.
Term or Condition:	The Proponent is encouraged to address the potential direct and indirect effects that may result from Project employees' on-site use of various Inuktitut dialects as well as other spoken languages, specifically paying attention to the potential alienation of some employees that may occur as a result of language or other cultural barriers.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**143**
Category:	Livelihood and Employment – Employee family contact
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To enable and foster connection and contact between employees and family members.
Term or Condition:	The Proponent is encouraged to consider the use of both existing and innovative technologies (e.g. community radio station call-in shows, cell phones, video-conferencing, Skype, etc.) as a way to ensure Project employees are able to keep in contact with family and friends and to ward off the potential for feelings of homesickness and distance to impact on employee retention and family stability.

Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**144**
Category:	Livelihood and Employment – Requirements for employment
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To ensure that the prerequisites and requirements for employment are clear and well known in work readiness programs.
Term or Condition:	The Proponent is encouraged to make requirements for employment clear in its work-readiness and other public information programs and documentation, including but not limited to: education levels, criminal records checks, policies relating to drug and alcohol use and testing, and language abilities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**145**
Category:	Livelihood and Employment – Barriers to employment for women
Responsible Parties:	The Proponent, Government of Nunavut, members of QSEMC
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor and understand the existence of barriers to employment for women specifically relating to childcare availability and costs.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring Committee to monitor the barriers to employment for women, specifically with respect to childcare availability and costs.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**146**
Category:	Livelihood and Employment – Availability of childcare for Project employees
Responsible Parties:	Government of Nunavut and Qikitani Inuit Association
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To lessen the barriers to employment as relating to the availability of childcare.
Term or Condition:	The Government of Nunavut and the Qikiqtani Inuit Association are strongly encouraged to investigate the possibility for Project revenue streams to support initiatives or programs which offset or subsidize childcare for Project employees.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**147**
Category:	Livelihood and Employment – Affordability of housing
Responsible Parties:	The Proponent, Government of Nunavut and Nunvut Housing Corporation

Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To lessen the barriers to maintaining employment as relating to the availability and costs of housing.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut and the Nunavut Housing Corporation to investigate options and incentives which might enable and provide incentive for employees living in social housing to maintain employment as well as to negotiate for and obtain manageable rental rates.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Economic Development and Self-Reliance, and Contracting and Business Opportunities

Term and Condition No.	**148**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Food security
Responsible Parties:	The Proponent, Members of the QSEMC
Project Phase:	Construction and Operations
Objective:	To improve understanding of the interactions between the Project and Inuit harvesting and how this relates to food security for residents of the North Baffin.
Term or Condition:	The Proponent is encouraged to undertake collaborative monitoring in conjunction with the Qikiqtaaluk Socio-Economic Monitoring Committee's monitoring program which addresses Project harvesting interactions and food security and which includes broad indicators of dietary habits.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Commentary: *If available, the Proponent should also incorporate information regarding harvesting and food security indicators generated under the auspices of the Nunavut General Monitoring Plan.*

Term and Condition No.	**149**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts of temporary closure
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To further the understanding of how a temporary closure may impact on the well-being of the residents and businesses of the North Baffin region.
Term or Condition:	Prior to the commencement of operations, the Proponent is required to undertake an analysis of the risk of temporary mine closure, giving consideration to how communities in the North Baffin region may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**150**

Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Impacts to visitors of Sirmilik National Park
Responsible Parties:	The Proponent, Parks Canada
Project Phase:	Construction and Operations
Objective:	To limit potential of Project impacts upon visitors, researchers and/or beneficiary users of the Sirmilik National Park.
Term or Condition:	The Proponent will ensure the following: a. The Proponent will maintain, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons. b. The Proponent will ensure that certification of noise compliance is current, where compliance is applicable. c. The Proponent is encouraged to provide Parks Canada with regular flight and shipping schedules that can be used to brief Park visitors. d. The Proponent is strongly encouraged to provide due consideration to wilderness experience during its operations in the open water season, especially during the month of August which is typically a time of high use by sea kayakers.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**151**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – Access to housing
Responsible Parties:	The Proponent
Project Phase:	Construction and Operations
Objective:	To investigate ways that economic development and self-reliance may improve access to housing by employees.
Term or Condition:	The Proponent is encouraged to investigate measures and programs designed to assist Project employees with homeownership or access to affordable housing options.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**152**
Category:	Economic Development and Self-Reliance, and Contracting and Business Opportunities – IIBA contract requirements
Responsible Parties:	The Proponent, Qikiqtani Inuit Association
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To improve ability of small businesses to access Project contract and sub-contract opportunities.
Term or Condition:	The Qikiqtani Inuit Association is encouraged to provide the Board and the Qikiqtaaluk Socio-Economic Monitoring Committee with information regarding the effectiveness of any provisions within the Inuit Impact and Benefit Agreement which may require that larger contracts be broken down into smaller size in order that they are reasonably managed by smaller businesses in the North Baffin region, while respecting any confidential or

	priveliged information.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Human Health and Well-Being

Term and Condition No.	**153**
Category:	Human Health and Well-Being – Employee and family health and well-being
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Closure and Post-Closure Monitoring
Objective:	To provide adequate medical services on site, including those that contribute to the mental health and well-being of all employees.
Term or Condition:	The Proponent is encouraged to employ a mental health professional to provide counselling to Inuit and non-Inuit employees in order to positively contribute toward employee health and well-being.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**154**
Category:	Human Health and Well-being – Indirect impacts to health and well-being
Responsible Parties:	The Proponent, Government of Nunavut, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To understand the indirect impacts of the Project upon health and well-being.
Term or Condition:	The Proponent shall work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring Committee to monitor potential indirect effects of the Project, including indicators such as the prevalence of substance abuse, gambling issues, family violence, marital problems, rates of sexually transmitted infections and other communicable diseases, rates of teenage pregnancy, high school completion rates, and others as deemed appropriate.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**155**
Category:	Human Health and Well-being – Employee cohesion
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To encourage the on-site cohesion of employees through cultural-awareness and social programs.
Term or Condition:	The Proponent is strongly encouraged to provide the NIRB with an updated report on its development of mitigation measures and plans to deal with potential cultural conflicts which may occur at site as these may become needed.
Reporting Requirements:	To be provided at least 60 days prior to the commencement of any construction activities.

Term and Condition No.	156
Category:	Human Health and Well-Being – Support initiatives
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To assist with fostering well-being within point-of-hire communties.
Term or Condition:	The Proponent is encouraged to assist with the provision and/or support of recreation programs and opportunities within the potentially affected communities in order to mitigate potential impacts of employees' absences from home and community life.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	157
Category:	Human Health and Well-Being – Counseling and treatment programs
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To make available, necessary treatment and counseling services for employee and family well-being.
Term or Condition:	The Proponent should consider providing counseling and access to treatment programs for substance and gambling addictions as well as which address domestic, parenting, and marital issues that affect employees and/or their families.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Community Infrastructure and Public Services

Term and Condition No.	158
Category:	Community Infrastructure and Public Services – Impacts to health services
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor indirect Project impacts to health and social services provided by the Government of Nunavut.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut and other parties as deemed relevant in order to develop a Human Health Working Group which addresses and establishes monitoring functions relating to pressures upon existing services and costs to the health and social services provided by the Government of Nunavut as such may be impacted by Project-related in-migration of employees, to both the North Baffin region in general, and to the City of Iqaluit in particular.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	159
Category:	Community Infrastructure and Public Services – Impacts to infrastructure
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To monitor Project-related impacts to infrastructure within the Local Study Area communities.
Term or Condition:	The Proponent is encouraged to work with the Government of Nunavut to develop an effects monitoring program that captures increased Project-related pressures to community infrastructure in the Local Study Area communities, and to airport infrastructure in all point-of-hire communities and in Iqaluit.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	160
Category:	Community Infrastructure and Public Services – Distribution of benefits
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Government of Nunavut
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure the distribution of benefits is done in a way that off-sets Project-related impacts to infrastructure or services.
Term or Condition:	The Government of Nunavut and the Qikiqtani Inuit Association are encouraged to cooperate to ensure in a broad sense, that Project benefits are distributed across impacted communities and across various demographic groups within these communities in a manner that best offsets any Project-related impacts to infrastructure or services.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	161
Category:	Community Infrastructure and Public Services – Policing
Responsible Parties:	The Proponent, Government of Nunavut, Royal Canadian Mounted Police
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure the territorial government and its policing service are adequately prepared to handle any Project-related increases to the need for service and associated impacts.
Term or Condition:	The Government of Nunavut should be prepared for any potential increased need for policing, and ensure that the Royal Canadian Mounted Police is prepared to handle ongoing Project-related demographic changes and subsequent crime prevention that may be needed as a result of the development, operation, and closure of the Project.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Culture, Resources and Land Use

Term and Condition No.	162
Category:	Culture, Resources and Land Use – Public consultation
Responsible Parties:	The Proponent, Elders and community members of the North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure the ongoing and consistent involvement of Elders and community members in developing and revising monitoring and mitigation plans.
Term or Condition:	The Proponent should make all reasonable efforts to engage Elders and community members of the North Baffin communities in order to have community level input into its monitoring programs and mitigative measures, to ensure that these programs and measures have been informed by traditional activities, cultural resources, and land use as such may be implicated or impacted by ongoing Project activities.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	163
Category:	Culture, Resources and Land Use – Public consultation
Responsible Parties:	The Proponent, North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To involve communities in the development and evolution of management and monitoring plans.
Term or Condition:	The Proponent shall continue to engage and consult with the communities of the North Baffin region in order to ensure that Nunavummiut are kept informed about the Project activities, and more importantly, in order that the Proponent's management and monitoring plans continue to evolve in an informed manner.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	164
Category:	Socio-Economic Impacts – Shipping notification
Responsible Parties:	The Proponent, Elders and community members of the North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	In order to inform members of North Baffin communities of planned Project shipping transits such that community members' planned travel routing may be adjusted to avoid interaction with Project ships and/or ship tracks.
Term or Condition:	The Proponent is required to provide notification to communities regarding scheduled ship transits throughout the regional study area, real-time data regarding ships in transit and any changes to the proposed shipping schedule.

Reporting Requirements:	The infomration required shall be provided on a monthly basis at a minimum or more often as the Proponent determines necessary and is to be provided to the Proponent's community liaison officers and those of the Qikiqtani Inuit Association as well as the Hunters and Trappers Organizations and Hamlet organizations of the North Baffin communities, Coral Harbour, and the NIRB's Monitoring Officer. Where deviations from the proposed schedule or routing are required, this information shall be provided as soon as possible.

Term and Condition No.	**165**
Category:	Socio-Economic Impacts – Emergency shelters
Responsible Parties:	The Proponent, Elders and community members of the North Baffin communities
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	In order to provide for human safety precautions in the event of adverse weather or other emergency situations along segments of linear transportation infrastructure.
Term or Condition:	The Proponent is strongly encouraged to provide buildings along the rail line and Milne Inlet Tote Road for emergency shelter purposes, and shall make these available for all employees and any land users travelling through the Project area. In the event that these buildings cannot, for safety or other reasons be open to the public, the Proponent is encouraged to set up another form of emergency shelters (e.g. seacans outfitted for survival purposes) every 1 kilometre along the rail line and Milne Inlet Tote Road. These shelters must be placed along Tote Road and rail routing prior to operation of either piece of infrastructure, and must be maintained for the duration of project activities, including the closure phase.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**166**
Category:	Socio-Economic Impacts – Public Consultation
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure members of the public are able to access shipping information on an as-required basis in order to inform potential users of the scheduled Project activities which could require deviations to land users' schedules or routing.
Term or Condition:	The Proponent should ensure through its consultation efforts and public awareness campaigns that the public have access to shipping operations personnel for transits into and out of both Steensby Inlet port and Milne Inlet port either via telephone or internet contact, in order that any questions regarding ice conditions or ship movements that could assist ice users in preparing for travel may be answered by Project staff in a timely fashion.

Reporting Requirements:	To be developed following approval of the Project by the Minister

Benefits, Royalty, and Taxation

Term and Condition No.	**167**
Category:	Benefits, Royalty and Taxation – Partnership Agreements
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	Construction
Objective:	The Proponent and the Government of Nunavut develop a formalized partnership agreement.
Term or Condition:	The Proponent and the Government of Nunavut are strongly encouraged to, as soon as practical following the issuance of the Project Certificate, enter into discussions to negotiate a Development Partnership Agreement.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Governance and Leadership

Term and Condition No.	**168**
Category:	Governance and Leadership – Monitoring program
Responsible Parties:	The Proponent, members of the QSEMC
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	Outline variables that are relevant to the Project and which should be adopted by the QSEMC's monitoring program.
Term or Condition:	The specific socioeconomic variables as set out in Section 8 of the Board's Report, including data regarding population movement into and out of the North Baffin Communities and Nunavut as a whole, barriers to employment for women, project harvesting interactions and food security, and indirect Project effects such as substance abuse, gambling, rates of domestic violence, and education rates that are relevant to the Project, be included in the monitoring program adopted by the Qikiqtani Socio-Economic Monitoring Committee.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Commentary: *As noted previously, if available, the Proponent should also incorporate information regarding the specific variables in Section 8 of the Board's Final Hearing Report that may be monitored under the auspices of the Nunavut General Monitoring Plan.*

Term and Condition No.	**169**
Category:	Governance and Leadership – Monitoring economic effects
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure / Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To maintain transparency inform communities in relation to economic benefits associated with the Project.

Term or Condition:	The Proponent provide an annual monitoring summary to the NIRB on the monitoring data related to the regional and cumulative economic effects (positive and negative) associated with the Project and any proposed mitigation measures being considered necessary to mitigate the negative effects identified.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Other Terms and Conditions

Accidents and Malfunctions

Term and Condition No.	**170**
Category:	Accidents and Malfunctions – Terrestrial Wildlife Management and Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	Updates to plan in order to better understand the potential for, and to minimize possible caribou-railway interactions.
Term or Condition:	The Proponent shall include in an updated Terrestrial Wildlife Management and Monitoring Plan, plans for increased caribou monitoring efforts including weekly winter track surveying and summer and fall surveys undertaken on foot twice per month.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**171**
Category:	Accidents and Malfunctions – Terrestrial Wildlife Management and Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	Updates to plan in order to minimize potential for caribou-railway interactions.
Term or Condition:	The Proponent shall include within its updated Terrestrial Wildlife Management and Monitoring Plan, a commitment to establish deterrents along the railway embankment at any areas where it is determined that caribou are utilizing the embankment to facilitate movement and where such movement presents a likelihood of caribou mortality to occur.
Reporting Requirements:	To be developed following approval of the Project by the Minister

Term and Condition No.	**172**
Category:	Accidents and Malfunctions – Overwintered fuel vessel
Responsible Parties:	The Proponent
Project Phase:	Construction
Objective:	To provide evidence that vessel to be used is fit and insured for proposed use.

Term or Condition:	The Proponent is encouraged to provide the Government of Nunavut with evidence that the vessel that it intends to use for the overwintering of fuel has been designed and certified for use under the conditions which it is expected to operate, and that it be required to provide copies of the vessel owners' insurance policies.
Reporting Requirements:	The required information is to be provided to the Government of Nunavut as soon as possible, and at a minimum, at least 60 days prior to the commencement of any construction related shipping.

Term and Condition No.	**173**
Category:	Accidents and Malfunctions – Use of containment booms
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Closure and Post-Closure Monitoring
Objective:	To provide additional spill contingency measures for spills in marine areas.
Term or Condition:	The Proponent shall employ full containment booms during all ship-to-shore and other marine-based fuel transfer events.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**174**
Category:	Accidents and Malfunctions – Community level spill response
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Closure
Objective:	To improve community ability to assist in spill response.
Term or Condition:	The Proponent and the Canadian Coast Guard are required to provide spill response equipment and annual training to Nunavut communities along the shipping route to potentially improve response times in the event of a spill.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**175**
Category:	Accidents and Malfunctions – Ship track markers in ice cover
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Hunters and Trappers Organizations of the North Baffin region and Coral Harbour
Project Phase:	Construction, Operations, Closure and Post-Closure Monitoring
Objective:	To ensure that measures taken to mark the shipping track(s) during periods of ice cover are effective in advising ice-based travelers, and that, where necessary, revisions to this practice can be made to ensure public safety.
Term or Condition:	The Proponent shall, in coordination and consultation with the Qikiqtani Inuit Association and the Hunters and Trappers Organizations of the North Baffin communities and Coral Harbour, provide updates to its Shipping and Marine Mammals Management Plan to include adaptive management measures it proposes to take should the placement of reflective markers along the ship track in winter months not prove to be a feasible method of marking the track to ensure the safety of ice-based travelers.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	176
Category:	Accidents and Malfunctions – Revised spill modeling
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Closure and Post-Closure Monitoring
Objective:	To improve community ability to assist in spill response.
Term or Condition:	The Proponent is required to revise its spill planning to include additional trajectory modeling for areas of Hudson Strait, such as Mill Island, where walrus concentrate, as well as for mid-Hudson Strait during winter conditions.
Reporting Requirements:	The updated modeling shall be provided to the NIRB and to Fisheries and Oceans Canada for review at least 3 months prior shipment of bulk fuel to Steensby Inlet.

Term and Condition No.	177
Category:	Accidents and Malfunctions – Foreign flagged vessels
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Closure and Post-Closure Monitoring
Objective:	To ensure foreign flagged ships operating in Canadian waters are held to the same standard as domestic ships with regard to emergency response planning.
Term or Condition:	The Proponent shall enroll any foreign flagged vessels commissioned for Project-related shipping within Canadian waters into the relevant foreign program equivalent to Transport Canada's Marine Safety Delegated Statutory Inspection Program.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Alternatives Analysis

Term and Condition No.	178
Category:	Alternatives Analysis – Mill Island shipping route consideration
Responsible Parties:	The Proponent, Qikiqtani Inuit Association, Nunavut Impact Review Board, Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance
Objective:	To prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island.
Term or Condition:	Subject to safety considerations and the potential for conditions, as determined by the crew of transiting vessels, to result in route deviations, the Proponent shall require project vessels to maintain a route to the south of Mill Island to prevent disturbance to walrus and walrus habitat on the northern shore of Mill Island.
Reporting Requirements:	Where project vessels are required to transit to the north of Mill Island owing to environmental or other conditions, an incident report is to be provided to the Marine Environment Working Group and the NIRB within 30 days, noting all wildlife sightings and interactions as recorded by shipboard monitors. The Proponent shall summarize all incidences of deviations from

	the nominal shipping route as presented in the FEIS to the NIRB annually, with corresponding discussion regarding justification for deviations and any observed environmental impacts.

Operational Variability

Term and Condition No.	**179**
Category:	Operational Variability
Responsible Parties:	The Proponent
Project Phase:	Operations
Objective:	To apply the precautionary principle in respect of potential effects on marine wildlife and marine habitat from changes to shipping frequency that may result from a significant increase in mine production for an extended period of time.
Term or Condition:	Baffinland shall not exceed 20 ore carrier transits to Steensby Port per month during the open water season and 242 transits per year in total.
Reporting Requirements:	To be developed following approval by the Minister

Transboundary Effects

Term and Condition No.	**180**
Category:	Transboundary Effects – Makivik Corporation involvement in the Marine Environment Working Group
Responsible Parties:	The Proponent, members of the Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enable Makivik Corporation and Nunavik communities near shipping lanes to remain informed and involved in those shipping activities which could affect the marine environment and marine mammals.
Term or Condition:	The Marine Environment Working Group established for this Project shall invite a representative from Makivik Corporation to be a member of the Group
Reporting Requirements:	To be developed following approval by the Minister

Term and Condition No.	**181**
Category:	Transboundary Effects – Marine Environment Working Group reporting
Responsible Parties:	The Proponent, members of Marine Environment Working Group
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enable Makivik Corporation and Nunavik communities near shipping lanes to remain informed and involved in those shipping activities which could affect the marine environment and marine mammals.
Term or Condition:	Regardless of whether Makivik Corporation participates as a member of the Marine Environment Working Group, the Marine Environment Working Group will provide Makivik Corporation with regular updates regarding the

	activities of the Marine Environment Working Group throughout the Project life cycle.
Reporting Requirements:	To be developed following approval by the Minister

Term and Condition No.	**182**
Category:	Transboundary Effects – Reporting to Marine Environment Working Group (MEWG)
Responsible Parties:	The Proponent, Makivik Corporation
Project Phase:	Construction, Operations, Temporary Closure /Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To enable Makivik Corporation and Nunavik communities near shipping lanes to remain informed and involved in those shipping activities which could affect the marine environment and marine mammals.
Term or Condition:	Baffinland shall make available to Makivik Corporation any ship route deviation reports provided to the NIRB in accordance with the terms and conditions set out in Section 4.12.4 of the Final Hearing Report.
Reporting Requirements:	To be developed following approval by the Minister

APPENDIX A – MONITORING PROGRAM

[To be developed]

January 10, 2013

Mr. Ryan Barry
Executive Director
Nunavut Impact Review Board
PO Box 1360
Cambridge Bay, NU
X0B 0C0

Re: Request to Amend Project Certificate No.005 – Mary River Project

Dear Ryan:

The Project Certificate issued by the Nunavut Impact Review Board (NIRB) on December 28th, 2012 has authorized the Mary River Project, as described in the Final Environmental Impact Statement (FEIS), to proceed to the Regulatory phase where various permits and licences will be pursued by Baffinland. Once obtained, the Project Certificate along with all applicable regulatory permits, enable the planned four year construction of the Mary River Project. In the current global financial environment the large development capital cost for the Mary River Project is difficult to finance. This same effect is being felt by many major projects around the world. Additionally, the risks associated with large capital developments are magnified during tight financial markets.

ArcelorMittal and Iron Ore Holdings wish to proceed with the project, and have authorized the company to execute a phased approach to the Mary River Project. At a Board meeting held just before Christmas the Board of Directors made the decision to develop a phased strategy approach that will initially see a first development phase with reduced upfront capital requirements and shortened construction duration such that production and revenue generation are able to commence sooner with the objective of facilitating the second, larger, Rail phase (as described in the FEIS) of the Project at a later date. This importantly will allow for training, employment, and business opportunities for the region to commence in 2013 and allow all parties to be in a stronger position to realize maximum benefits once the second larger phase development proceeds.

Baffinland remains committed to the Project as defined in the FEIS and to the approved Project Certificate. However, Baffinland is re-introducing a concept that was considered earlier but was deferred at that time due to business drivers. The Early Revenue Phase (the proposed first development phase) will include development of a nominal 3.5 million tonne per annum (Mt/a) road haulage operation from Mary River to a small port facility at Milne Inlet for shipping of iron ore during the open water season. The operation will be very similar in concept to the bulk sample program undertaken by Baffinland in 2008. Please refer to Appendix A for an overview of the Early Revenue Stage.

The road haulage of ore from the Mine Site to Milne Port was originally proposed and evaluated in the Draft Environmental Impact Statement (DEIS) that was submitted by Baffinland in January 2011 but was subsequently removed prior to the submission of the FEIS. It is also important to

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note that community scoping sessions were held and Guidelines developed and issued by the NIRB as guidance for Baffinland's development of the Environmental Impact Statement. There was also an initial round of Information Requests (IR's) submitted by all parties on the DEIS submission. It will be the intention of Baffinland to ensure it addresses information requests when it submits an addendum to the FEIS for the Early Revenue Phase. The addendum will describe the activities associated with the Early Revenue Phase, and will provide an updated effects assessment for the activities proposed for the various Valued Ecosystem Components (VEC's). Management Plans will be updated to accommodate changes relevant to proposed ERP activities.

Baffinland recognizes and appreciates that this Early Revenue Phase will require an amendment to the recently issued Project Certificate #005 and that transporting of ore to Milne Inlet as well as shipping ore out of Milne Inlet will only proceed once an approved amendment has been issued and other potential amendments to Regulatory permits and licences are complete. It is envisioned that an amended Project Certificate may need to alter some existing terms and conditions or may need to add additional terms and conditions. Baffinland looks forward to direction from the NIRB as to what documentation and review process will be required for the Early Revenue Phase.

Baffinland remains fully committed to and will continue to obtain all the various existing Regulatory permits and licences applied for (i.e. Class A Water Licence, DFO Authorizations, Leases, Land Use Permits, etc.) under the recently approved Mary River Project.

We recognize and appreciate all the hard work and contributions by the NIRB, the various regulatory review agencies, the Qikiqtani Inuit Association, the Government of Nunavut, and our community stakeholders in obtaining a Project Certificate for the Project. Baffinland remains committed to developing the Mary River Project in the near term despite the current global financial challenges, and believe that this Early Revenue Phase will allow the Project generate benefits to Nunavut in the near term. We look forward to the NIRB reviewing this request and initiating the process required to amend the project certificate in a timely manner.

Should there be any questions or clarifications required from this letter, please feel free to call the undersigned at 416-996-5523 or Oliver Curran at 416-814-3195.

Yours truly,

Erik Madsen, Vice President
Sustainable Development, Health, Safety & Environment

c.c Damien Cote (NWB)

Appendix A
Early Revenue Phase (ERP) Component Overview

Overview

The Early Revenue Phase (ERP) will produce a nominal 3.5 million tonnes per annum (Mt/a) of iron ore mined from Deposit 1 and transported from the Mine Site to Milne Port over the Milne Inlet Tote Road on a year round basis. The ore will be stored in stockpiles at Milne Port ready for loading onto ships and transport to customers during the open water season only. Fuel to support the trucking operation will continue to be delivered to a tank farm facility at Milne Port each year. Ore handling operations consist of an ore stockpile, conveyors to transfer ore to the ore dock, and ship loading facilities at the ore dock. Shipping of supplies to Milne Port will occur during the approximately 90-day ice-free period of approximately July 15 to October 15. During the operation phase, the port will continue to be used to ship ore as part of the early revenue operation, as well as for resupply. Ships will follow a nominal shipping route from Milne Port, through Milne Inlet and into Eclipse Sound within the Nunavut Settlement Area and will continue to customer ports, primarily in Rotterdam and other European Ports.

Construction and Operations

The existing facilities at Milne Port will play a key logistical support role for receiving sealift materials at Milne Port and supporting construction of upgrades and operation of the Milne Inlet Tote Road.
The existing Milne Port facilities will be expanded early in the construction phase to prepare for the shipment of an expected nominal 3.5Mt/a of iron ore to markets. Existing facilities include: a personnel camp, water supply and treatment facilities, mobile diesel generators, a sewage treatment plant, an incinerator, steel fuel tanks, borrow areas, rock quarries, laydown area, airstrip, and bulk sampling ore stockpile area will be expanded to accommodate the early revenue phase operation.

Ore stockpile areas, an ore dock and loading facilities will be added to the existing facilities to allow the loading of iron ore onto ships during the open season at Milne Port. A permanent freight dock will be installed to facilitate the timely offloading of equipment and materials from ships and the existing camp will be expanded to accommodate the peak personnel estimated to be needed during the construction phase. Prior to construction of the freight dock, early shipments will utilize barges that will be beached and offloaded.

Truck unloading facilities and conveyors will be constructed to move the ore from the transport trucks to the ore stockpiles. Mobile equipment (front-end loaders and a conveyor) will be provided for loading the ore from stockpiles onto ship loaders. Ore stockpiles will be constructed at Milne Port to store both lump and fine ore. The total stockpile size will have an approximate capacity of 3.5 Mt.

The Milne Inlet Tote Road was upgraded in 2008 from a winter road to an all-season road adequate for transporting equipment and ore during the bulk sampling program. The upgraded road follows the original alignment from when the road was constructed in the 1960s. While the road was upgraded over the period of 2007 and 2008, upgrades are required to support the level of traffic proposed with year round ore haulage from the Mine Site to Milne Port.

Ore carrying vessels will be chartered and operated by an established ship owner. Approximately 70 effective ship loading days during the open water period have been assumed to be available. Ore carrying vessels will arrive at Milne Port, will be loaded and will leave Milne Port during this period. Ships will be scheduled to arrive just prior to the completion of loading of the previous ship. Each round trip of a ship from Milne Port to a port in Europe is estimated to take 25 to 27 days.

In summary, the table below describes the project components and activities of the Early Revenue Phase at Milne Port and the Milne Inlet Tote Road.

Project Component	Description of Component/Activity
1. Shipping to and from Milne Port	Open water shipping from Milne Port during the life of the Project.
2. Use of the Milne Inlet laydown area	Lay down areas will be developed during construction. As well, ore stock piles, ore loading and conveyance systems, and port facilities will need to be constructed and operated during the life of the project.
3. Milne Tote Road	Upgraded for continuous year round operations. All weather water crossings and realignment of certain sections of the road will be constructed with quarry material.
4. Milne accommodation complex	Milne Inlet accommodation complex will be expanded during construction and used during operations including associated water, sewage, waste management, fuel storage.
5. Ore loading and handling	Crushing, screening and ore handling for truck transport from Mary River to Milne Port.

6. Maintenance services	Maintenance services need to be expanded to accommodate ore haulage trucks and road support crews at the Mary River Camp and at Milne Port.
7. Mary River accommodations and administrative support	Increased numbers of operators and support staff will be required to construct and manage the trucking activity, including expansion of associated accommodations, water, sewage, waste management, fuel storage.
8. Mining at Deposit 1	Mining of ore at deposit 1 including upgrade of mine haul road, explosive plant installation, and waste rock storage.

NIRB File No. 08MN053

January 14, 2013

Erik Madsen
Vice President Sustainable Development, Health, Safety & Environment
Baffinland Iron Mines Corporation
Suite 1016, 120 Adelaide Street West
Toronto, ON M5H 1T1

Sent via email: erik.madsen@baffinland.com

Re: Acknowledgement of Request to Amend Project Certificate No. 005 – Mary River Project Received From Baffinland Iron Mines Corporation on January 10, 2013

On January 13, 2013 the Nunavut Impact Review Board (NIRB or Board) received the enclosed correspondence from Baffinland Iron Mines Corporation (Baffinland or the Proponent) which indicated that, due to various business drivers, Baffinland proposes to make changes to the schedule and some activities in the initial stages of project development associated with the Mary River Project Proposal for which the NIRB recently issued Project Certificate No. 005 (the 'Project Certificate').

Summary of the Request

In its request Baffinland indicated that although the Proponent remains committed in the long-term to developing the Project as authorized in the Project Certificate, in the short term Baffinland proposes to change some development activities and project timelines to accommodate an "Early Revenue Phase" which would include development of a nominal 3.5 million tonne per annum (Mt/a) road haulage operation from the Mary River mine site to a port facility at Milne Inlet for shipping of iron ore during the open water season only.   As noted by Baffinland, this development option was presented previously as a project alternative, and was included within the initial technical review of the Draft Environmental Impact Statement for the Mary River Project Proposal. However, following the submission of Information Requests by parties this alternative was removed from further consideration by Baffinland and was not subsequently included in the Final Environmental Impact Statement and was not considered by the NIRB during the Final Hearing in respect of the Project Proposal. As this alternative was not considered during the Final Hearing, the current terms and conditions in the Project Certificate do not directly address the potential for impacts associated with Baffinland's proposed implementation of this development scenario.

Baffinland further outlined its understanding that the proposed modifications to the project proposal would necessitate changes to the existing Project Certificate and consequently proposed to submit an addendum to the Final Impact Assessment Statement to now include this option. Further, Baffinland's proposed addendum would also take into account the relevant comments and information requests of the parties submitted during their review of the 2011 Draft Environmental Impact Statement.

RECONSIDERATION OF THE TERMS AND CONDITIONS OF PROJECT CERTIFICATE

As all parties are aware, the current Project Certificate as issued on December 28, 2012 is the product of a rigorous review process which provided opportunities for public comment through both written submissions and participation in the Final Hearing associated with the Project Proposal. However, the development review process under the Nunavut Land Claims Agreement (NLCA) also recognizes that the Project Certificate is not a static document, and that to be effective, a Project Certificate must reflect the actual circumstances of a Project Proposal as those circumstances evolve and change. Sections 12.8.2 and 12.8.3 of the NLCA set out how the terms and conditions in a given Project Certificate may be reconsidered:

> 12.8.2 NIRB may on its own account or upon application by a DIO, the proponent, or other interests, reconsider the terms and conditions contained in the NIRB certificate if it is established that:
>
> (a) the terms and conditions are not achieving their purpose;
>
> (b) the circumstances relating to the project or the effect of the terms and conditions are significantly different from those anticipated at the time the certificate was issued; or
>
> (c) there are technological developments or new information which provide a more efficient method of accomplishing the purpose of the terms and conditions.
>
> 12.8.3 Where the Minister determines that any of the conditions in Sub-sections 12.8.2(a), (b) or (c) have been established, NIRB shall reconsider the terms and conditions contained in a certificate, and NIRB shall produce a report of its reconsideration. The Minister may accept, reject or vary that report only on the grounds specified in Section 12.6.13. NIRB shall amend its certificate to reflect any changes as accepted, rejected or varied by the Minister.

Where the NIRB has established that terms and conditions within a Project Certificate require reconsideration, the NIRB would make application to the Minister to reopen the Project Certificate. Following confirmation from the Minister that the need for a formal reconsideration has been established, the Board would initiate a public review of the application, including technical meetings and written or oral hearings as deemed necessary in accordance with the NIRB's Rules of Procedures.[1] The project proponent would be required to provide any information determined to be necessary to facilitate the Project Certificate reconsideration. At

[1] NIRB's Rules of Procedures (2009) are available online from the Board's public registry at the following location: http://ftp.nirb.ca/06-RULES/

the conclusion of this review process the Board would provide a report of its reconsideration to the Minister for consideration and the NIRB would amend the Project Certificate as necessary based on the Minister's acceptance or variance of this report.

REQUEST FOR COMMENTS

Reflecting the NIRB's jurisdiction to reconsider the terms and conditions of an existing Project Certificate under Article 12 of the NLCA and the important role of public and technical comment submissions that supported the development of the terms and conditions in the existing Project Certificate, the NIRB is seeking comments on Baffinland's request from parties and agencies with jurisdiction, authority and/or licences and approvals associated with the Mary River Project Proposal prior to determining whether the proposed changes warrant reconsideration of the existing Project Certificate in accordance with NLCA Section 12.8.2. In asking for comments at this point, the NIRB acknowledges that Baffinland has indicated considerably more detail regarding the proposed amendments to the Project Proposal would be provided in future, and the NIRB notes that if it establishes that the terms and conditions of the Project Certificate are to be reconsidered it is anticipated that a comprehensive submission in the form of an update or addendum to the Final Environmental Impact Statement would be required to support the required technical review. The NIRB would, at that time, solicit additional comments from the parties with respect to the potential for ecosystemic and socio-economic impacts associated with Baffinland's proposed amendment.

By copy of this letter, the NIRB invites parties with jurisdiction and members of the public to provide comments to the Board with respect to Baffinland's request for a reconsideration of the terms and conditions in Project Certificate 005, and specifically, the Board asks for comments on the following:

- Whether the proposed changes, as presented in the request meet the requirement for reconsideration as set out in the NLCA, Section 12.8.2 (a), (b), or (c), and if so, which provisions of the NLCA trigger the reconsideration;
- Whether, at this point the parties have identified any specific terms and conditions within Project Certificate No. 005 that would need to be reconsidered or amended to reflect the Early Revenue Option;
- Whether a reconsideration of the Project Certificate terms and conditions is likely to arouse significant public concern, and if so, a description of the basis for the concern;
- Whether parties have comments or concerns regarding the potential format of the update or addendum to the existing Final Environmental Impact Statement required to support the reconsideration of the Project Certificate; and,
- Any matter of importance to the Party related to the request to reconsider the terms and conditions of the Project Certificate by the NIRB.

The NIRB requests that interested parties submit comments directly to the NIRB via email to info@nirb.ca or via fax to (867) 983-2594 on or before **February 4, 2013**.

NEXT STEPS

Following the Board's receipt and review of comments received, the Board will: (a) determine whether the proposed changes are sufficient to warrant reconsideration under Section 12.8.2 of the NLCA; and (b) if the Board determines that the Project Certificate terms and conditions must be reconsidered, the NIRB would put seek support from the Minister of Aboriginal Affairs and Northern Development (the Minister) to initiate the formal reconsideration of the Project Certificate terms and conditions. In the event a reconsideration of existing Project Certificate terms and conditions is recommended by the Board and supported by the Minister, the Board would provide all parties with further direction on next steps and associated timelines at that time.

Should you have any questions or require further clarification, please contact Amanda Hanson, Director of Technical Services at (867) 983-4615 or via email at ahanson@nirb.ca.

Sincerely,

Ryan Barry
Executive Director
Nunavut Impact Review Board

cc: Sharon Ehaloak, Nunavut Planning Commission
Damien Côté, Nunavut Water Board
Stephen Williamson-Bathory, Qikiqtani Inuit Association
Pauloosie Suvega, Government of Nunavut
Robin Aitken, Aboriginal Affairs and Northern Development Canada
Luc Fortin, Canadian Transportation Agency
Mark Dahl, Environment Canada
Derrick Moggy, Fisheries and Oceans Canada
Rob Johnstone, Natural Resources Canada
Meighan Andrews, Transport Canada
Mary River Distribution List

Enclosed: Baffinland Letter to the NIRB Re PC Amendment Request (January 10, 2013)

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Nunavunmi Parnaiyiit
Nunavut Planning Commission
Commission d'Aménagement du Nunavut

February 7, 2013

Mr. Ryan Barry
Executive Director
Nunavut Impact Review Board
PO Box 1360
Cambridge Bay
X0B 0C0

BY EMAIL rbarry@nirb.ca

Dear Mr. Barry,

Re BIMC request to Amend Project Certificate No.005 – Mary River Project

Thank you for the Nunavut Impact Review Boards (the NIRB) request for comments on Baffinland Iron Mine Corporations request to amend project certificate No.005-Mary River Project, which was received by the Nunavut Planning Commission (the NPC) on January 14th, 2013. The newly-proposed change by the proponent was specifically not considered in the Final Environmental Impact Statement. The proponent withdrew any reference to a northern route for ore and the Project Certificate No.005 was based on a southern route with a new rail link and new port.

As you are aware, the NPC issued a positive conformity determination for the Baffinland Iron Ore Mining Project (the Project) on April 30th, 2008. This determination included a number of requirements that the proponent has undertaken to comply with as part of their development activities. I have attached a copy of the determination with this letter for your records.

The NPC would remind the NIRB that the new development option as outlined in your January 14th correspondence and referred to as a "project alternative included within the initial technical review of the Draft Environmental Impact Statement", has not been

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reviewed by the NPC for conformity with the applicable land use plan. The different routing, as proposed in the January 14th, 2013 request for amendment, was not considered in the NPC's positive conformity determination issued on April 30th, 2008.

To be clear, the conformity determination provided by the NPC was based on the project that the proponent sought approval for, and not the project the proponent now proposes.

Under section 11.5.10 of the Nunavut Land Claims Agreement, the NPC shall review and determine whether project proposals conform to an applicable land use plan before forwarding the project proposal with its determination and any recommendations to the appropriate federal and territorial agencies. Pursuant to section 12.3.4 of the Nunavut Land Claims Agreement, NIRB shall not screen project proposals that are not in conformity with land use plans, unless a Ministerial exemption has been received under 11.5.11 or a variance has been approved under section 11.5.10. Neither of these has yet occurred.

Once again thank you for circulating the request for comments on Baffinland Iron Mine Corporations request related to project certificate No.005-Mary River Project to the NPC.

Please contact me should you have any questions.

Yours Truly,

Brian Aglukark,
Director, Implementation
Nunavut Planning Commission

CC. Erik Madsen, BIMC

Encl.

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Nunavunmi Parnaiyiit
Nunavut Planning Commission
Commission d'Aménagement du Nunavut

April 13, 2013

Mr. Erik Madsen
Vice President Sustainable Development, Health, Safety & Environment
Baffinland Iron Mines Corporation
Suite 1016, 120 Adelaide Street West
Toronto, ON M5H 1T1

BY EMAIL erik.madsen@baffinland.com

Dear Mr. Madsen

RE: <u>NPC's Procedure for Review of the Mary River Project – NIRB File No. 08MN053 Amendment Request to Certificate No. 005</u>

The NIRB advised interested parties that the Baffinland Iron Mines Corporation (BIMC) will be submitting an addendum to its Final Environmental Impact Statement for consideration for a proposed Early Revenue Phase for the Mary River Project – NIRB File No. 08MN053 in June 2013 or shortly thereafter. This letter summarizes the procedure the NPC will perform to address the proposed addendum related to the Certificate No. 0005 as required by section 11.5.10 Nunavut Land Claims Agreement (NLCA).

The procedure is as follows:

1. Upon receipt of all the core applications for an amendment related to the Certificate No.0005 and before the related authorizations have been granted, the NPC will determine on a timely basis whether the works or activities proposed in the application are relevant to the conformity requirements of the North Baffin Regional Land Use Plan (NBRLUP).

2. If not, the NPC will advise the proponent and the relevant agencies that the works and activities are not relevant to plan requirements, and that no conformity review is necessary. (In other words, from the planning perspective, such works and activities will be treated as not changing the project proposal that already has been reviewed for conformity under section 11.5.10.)

3. If so, the NPC will conduct a conformity review and advise the proponent and the relevant authorizing agencies of its determination. (In other words, such works or activities will be treated as distinct project proposals for the purpose of section 11.5.10 of the NLCA.)

a. If the works and activities are in conformity with the NBRLUP (i.e. the conformity determination is positive), the NPC shall, subject to sections 12.3.2, 12.3.3 and 12.4.3 of the *NLCA*, forward its determination and recommendations (if any) to the NIRB for screening.
b. If the NPC finds the amended project proposal is not in conformity with the NBRLUP, the NPC will not send the proposal to the NIRB. BIMC could in that event seek a Ministerial exemption to proceed to the reconsideration by NIRB.

The purpose of this procedure is to ensure that all land use plan requirements are applied to project amendments made after the project's authorization.

The NPC would like to point out that this procedure is based on two assumptions, which have to be correct if it is to operate efficiently and effectively. First, the NPC must be in receipt of all of the completed "core" applications relating to the Certificate N0. 005 when the original conformity determination was made. The project proposal that is contained in the completed "core" applications has to serve as the base for all of the NPC's conformity work. Second, the NPC must receive amended applications related to Certificate 005 that already have been reviewed for conformity by the NPC, on a timely basis. In the BIMC's case, the applications were referred to the NPC by the authorizing agencies. The NPC suggests those authorizing agencies that would require issuing a revised license or permitting immediately refer the application to the NPC to commence this procedure outlined above.

In closing, I hope that the responsible agencies can continue to coordinate their efforts in this way to ensure that the *NLCA* framework for the regulation of land and resources in Nunavut is fully respected and effectively implemented.

Sincerely,

Brian Aglukark
Nunavut Planning Commission

CC.	Ryan Barry	Nunavut Impact Review Board
	Bernie Mac Isaac	Qikiqtani Inuit Association
	Jeff Mercer	Aboriginal Affairs & Northern Development Canada
	Phyllis Beaulieu	Nunavut Water Board
	Amy Liu	Department of Fisheries & Ocean Canada