Nunavut Impact Review Board

Revised Final Hearing Report

Back River Gold Mine Project

Sabina Gold & Silver Corp.

NIRB File No. 12MN036

July 2017

INSIDE COVER PAGE

The Nunavut Impact Review Board's Primary Objectives under the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*, Article 12, Section 12.2.5:

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
Telephone: (867) 983-4600
Facsimile: (867) 983-2594

Cover Photo Credits: Board staff

Photo 1 Board Panel Members (from Left): Guy Alikut (alternate), Phillip (Omingmakyok) Kadlun, Marjorie Kaviq Kaluraq, and Allen Maghagak

THIS REPORT IS SUBMITTED TO THE HONOURABLE CAROLYN BENNETT, MINISTER OF INDIGENOUS AND NORTHERN AFFAIRS BY THE NUNAVUT IMPACT REVIEW BOARD ON THIS 18TH DAY OF JULY, 2017.

Allen Maghagak, Board Panel Member	Marjorie Kaviq Kaluraq, Board Panel Member

Phillip (Omingmakyok) Kadlun, Board Panel Chairperson

COVER LETTER

NIRB File No.: 12MN036

July 18, 2017

The Honourable Carolyn Bennett
Minister of Indigenous and Northern Affairs
Government of Canada
10 Wellington, 21st Floor
Gatineau, QC K1A 0H4

Sent via email and courier: minister@aadnc-aadnc.gc.ca; carolyn.bennett@canada.ca; infopubs@aadnc-aandc.gc.ca

Re: Revised Final Hearing Report for the Nunavut Impact Review Board's Assessment of Sabina Gold & Silver Corp.'s Back River Gold Mine Project Proposal

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Dear Honourable Minister Bennett:

In accordance with the jurisdiction of the Nunavut Impact Review Board (NIRB or Board) under Article 12, Part 5 of the *Nunavut Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada (*the *Nunavut Agreement)* the Nunavut Impact Review Board (NIRB or Board) is pleased to provide you with the attached revised Final Hearing Report in respect of Sabina Gold & Silver Corp.'s (the Proponent) Back River Gold Mine project proposal, NIRB File No. 12MN036 (the Project). This revised Final Hearing Report builds upon the original assessment of the Project conducted by the NIRB from 2012-2016, culminating in the NIRB's 2016 Final Hearing Report submitted to the Minister in June 2016. In the 2016 Final Hearing Report, based on the Board's concerns about uncertainty and the potential for specified significant adverse ecosystemic and socio-economic effects of the Project, the Board originally recommended that the Project not be allowed to proceed.

On January 12, 2017, the responsible Ministers referred the 2016 Final Hearing Report back to the Board for further consideration under Article 12, Section 12.5.7(e) of the *Nunavut Agreement*, noting that the Ministers found the 2016 Final Hearing Report to be deficient in five (5) key areas: caribou and terrestrial wildlife; freshwater aquatic environment; marine environment; water quality (ground and surface); and climate and meteorology.

To update the Board's assessment to address these deficiencies, the Board solicited additional information from the Proponent, comment submissions from Intervenors, community members and the public and conducted a supplemental Final Hearing. This revised Final Hearing Report builds on the 2016 Final Hearing Report to provide a summary of all information provided to the Board throughout this Review, including all information provided to the Board prior to and during both public hearings.

Reflecting significant improvements to the Project and associated effects mitigation, management and monitoring measures, the NIRB is now confident that the Project can be allowed to proceed to the regulatory stage. Having concluded that the Project should now be allowed to proceed, the NIRB has also provided in this Report recommendations to the Responsible Ministers regarding Terms and Conditions for the Project that Board has determined are required to ensure that the Project is developed in a manner consistent with the objectives set out in Article 12, Section 12.2.5 of the *Nunavut Agreement*. Accordingly, the Board provides this revised Final Hearing Report and recommended Terms and Conditions for your consideration and decision under Article 12, Section 12.5.7 of the *Nunavut Agreement*.

Should you have questions or require clarification regarding this matter, please contact the NIRB's Executive Director, Ryan Barry at (867) 983-4608 or rbarry@nirb.ca.

Sincerely,

Phillip (Omingmakyok) Kadlun
Chairperson of the Back River Gold Mine Project Proposal Panel (P5)
Nunavut Impact Review Board

cc: The Honourable Dominic LeBlanc, Minister of Fisheries and Oceans and the Canadian Coast Guard
The Honourable Jim Carr, Minister of Natural Resources
The Honourable Marc Garneau, Minister of Transport
The Honourable Hunter Tootoo, MP for Nunavut
The Honourable Peter Taptuna, Premier of Nunavut
Aluki Kotierk, President, Nunavut Tunngavik Incorporated
Stanley Anablak, President, Kitikmeot Inuit Association
Thomas Kabloona, Chairperson, Nunavut Water Board
Bruce McLeod, President and CEO, Sabina Gold & Silver Corp.
Matthew Pickard, VP Environment and Sustainability, Sabina Gold & Silver Corp.
Back River Distribution List

TITIRAANGIT UIGUANUT

NIRB Naunaitkutinga Nampa: 12MN036

July 18, 2017

Tamna Upinartuq Carolyn Bennett
Minihitauyuq Nunaqaqaqtut Ukiurtaqtumilu Havaktit
10 Wellington, 21 Natianit
Gatineau, QC K1A 0H4

Qaritauyakkut titirakkuuqhimayut agyaqtaqtikullu: minister@aadnc-aadnc.gc.ca;
carolyn.bennett@canada.ca;
infopubs@aadnc-aandc.gc.ca

Uumuuna: **Titiratqiktauhimayut Kingulliit Katimayunit Naunaitkutait taapkua Nunavunmi Avatiliqiyit Katimayiit Ihivriuqtainik Sabina-kut Kuluit Haviillu Kuapuriissait Hanningayumi Kulunik Uyaraghiuqvighaat Tughiruatainik**

Haluu Nanngariyauyuq Minista Bennett:

Malighugu ataniqtuqtauyut Nunavunmi Avatiliqiyit Katimayiinit (NIRB-kut imaaluuniit Katimayiit) ataagut Ilanga 12, Ilangani 5 talvani *Nunavunmi Angirutait Taapkua Inuit Nunavunmi Nunataarvingmi Nanngariyauyuqyuaqlu Kuin Kivgaqtuqhugu Kanata* (taamna *Nunavunmi Angirutauyuq)* Nunavunmi Avatiliqiyit Katimayiit (NIRB-kut imaaluuniit Katimayiit) quviahuktut tunihiyaami uiguanguyuq titiratqighimayunik Kingulliit Katimayunit Naunaitkutainik talvuuna Sabina-kut Kulunik Haviillu Kuapuriissait (Tughiraqtuq) Hanningayumi Kulunik Uyaraghiuqviup havaaghanut tughirautainik, NIRB-kut Titirautait nappaa 12MN036 (Havaaghaq). Titiratqiktauhimayuq Kingulliit Katimayunit Naunaitkutait ilittuqhautauhimmaaqtuq qauyihaqtainit NIRB-kut 2012-mit 2016-mut, ilitturinnaqhutik talvani NIRB-kut 2016-mi Kingulliit Katimayut Naunaitkutainit tuniyauhimayut Ministamut June-mi 2016-mi. Talvani 2016-mi Kingulliit Katimayut Naunaitkutainit, Katimayiit ihumaaluutait ihumagiplugit naahurinnaittunik ihumaplutiklu ihuilutinik nunamiutanut inuuhiqnullu-manighiurniqmit Havaaghanit, Katimayiit taapkua hivuani hapkuninnga Havaaghanik aullaqtittiquhimaittut.

January 12-mi, 2017-mi, munaqhiyut Ministauyut utiqtittihimayaat taapkua 2016-mi Kingulliit Katimayut Naunaitkutait Katimayinut ihumaliutqiktaghaat ataagut Ilanga 12, Ilangani 12.5.7(e) talvani *Nunavunmi Angirutinit,* naunaiqhitihimaplutik taimaa Ministauyut naunaiqhinnaitturiplugit 2016-mi Kingulliit Katimayut Naunaitkutait tallimanut (5) hapkununnga; tuktunik nunamiutallu anngutighat; imariktumiutat avatiit; taryumiutat avatiit; imap qanurininga (nunam qaanganit qaangatalu); hilamiklu hilaliqiniqlu.

Nutaannguqtirumaplugit Katimayiit qauyihautait ihumaaluutit ihuaqhainahuaqhugit, Katimayiit taapkua ilittuqhainahuaqpaktut Havakvingnit, uqauhiqniklu Nutqaqtittiyinit, nunallaaqmiunit inungnillu katimapkaihimaplutiklu Kingulliqpaamik tukliriplugu Katimatjutigiyaat. Titiratqiktauhimayuq Kingulliit Katimayut Naunaitkutait havakpaalliutauyuq talvanngat 2016-mi Kingulliit Katimayut Naunaitkutainit ilittuqhitighat tamangnik naunaitkutanik Katimayinut Ihivriuqhitillugit, tamangniklu naunaitkutat tuniyauhimayut Katimayinut katimatinnatik katimatillugillu.

Ilitturinnaqtut ihuaqhaitjutit Havakvingnut ihuilutiniklu mihingnairahuaqhutik, ataniqtuqtuiplutik munaqhiyullu havauhiigut, NIRB-kut naahurittialiqtut taapkua Havakvighat aulainnarianiktut aulattiarvighaanut havaaghainut. Ilihimaliqhutik taimaa Havaaghat hapkua aullaqtittiinnarialiktut, NIRB-kut iliqahiutihimayut hapkununnga Naunaitkutanut pitquhimayaita Ministauyut Uqauhiit Maliktaghallu mighaagut Havaaghanut taapkua Katimayiit pitquhimaquyaitut taimaa Havaaghat hapkua aullaqtitauttiaqtughat maliguaqhugit iniqtaghat titiraqhimayutut Ilanga 12-mi, Ilangani 12.2.5 talvani *Nunavunmi Angirutinit*. Maliguaqhutik, Katimayiit taapkua hailihimaliqtait hapkua Kingulliit Katimayut Naunaitkutait pitquyauhimayullu Uqauhiit Maliktaghallu ihumaliuqtaghatit ataagut taamna Ilanga 12, Ilangani 12.5.7 talvani *Nunavunmi Angirutainit*.

Apiqhuutighaqaruvit ilittuqhittiarumaguvilluuniit hapkuninnga, hivayaqlugu NIRB-kut Aulapkaiyiqyuangat, Ryan Barry talvani (867) 983-4608 talvaniluuniit rbarry@nirb.ca.

Titiraqtuq,

Phillip (Omingmakyok) Kadlun
Ighivautalik talvani Hanningayumi Kulunik Uyaraghiuqvik Havaaghainut Tughirautinik Ihivriuqhiyit (P5)
Nunavunmi Avatiliriryuakkut Katimayiit

Hamna Aadjikutaanik Tuyuqtauyut:

Nanngariyauyuq Dominic Leblanc, Ministauyuq Iqalliqiyinit Taryuliqiyinillu taapkualu Kaniittian Umiakkuuqtit Annaktit
Nanngariyauyuq Jim Carr, Ministauyuq Pitquhiuyunik Pivighanik
Nanngariyauyuq Marc Garneau, Ministauyuq Ingilrayuliqiyinit

Nanngariyauyuq Hunter Tootoo, Maligaliuqti Nunavunmi
Nanngariyauyuq Peter Taptuna, Hivuliqti Nunavunmi
Aluki Kotierk, Angayuqqaaq, Nunavut Tunngavikkut Timingat
Stanley Anablak, Angayuqqaaq, Qitirmiuni Inuit Katimayiit
Thomas Kabloona, Ighivautalik, Nunavunmi Imaliqiyit Katimayiit
Bruce McLeod, Angayuqqaaq CEO-ngupluni, Sabinat Kuluit Haviillu Kuapuriissait
Matthew Pickard, VP Avatiliqiyit Aulapkainahuaqniqlu, Sabina Kuluit Haviillu Kuapuriissait
Hanningayuq Kuugaq Tuniuqagauyut Titiqat

ᑎᑎᖅᑲᐅᑦ ᖁᑲᖅᓚ

ᓄᓇᕗᑦ ᐊᖏᑎᓕᕐᓱᓕᖅᑐᑦ ᑲᑎᒪᔨᖏᑦᑕ ᑎᑎᖅᑲᓄᑦ ᓴᓇᐅᑦ: 12MN036

ᐸᓪᓕᐊ 18, 2017

ᒪᓕᒐᓕᐅᖅᑎᖅᓯᐊᖅᖁᖅ ᑭᐊᑭᓕᓐ <ᓇᑦ
ᒥᓂᑦᓚᓴᐅᔪᖅ ᐃᓄᓕᓚᔨᑐᖅᑲᕆᑦ ᑲᓇᑕᒥ
10 ᐅᐊᓕᖕᒥᓐ, 21st ᖃᐅᒪᒍᐊᕐᕆᑦ
ᐃᑎᓄᑯ, ᑯᐊᐸᑲ K1A 0H4

ᐃᖃᓗᓐᓇᓄᖅᑲᐅᑎᕆᑦ ᑎᑎᖅᑲᑎᒍᓐᓃ ᓇᒃᑯᓴᓴᐅᔪᖅᖁᖅ: minister@aadnc-aadnc.gc.ca; carolyn.bennett@canada.ca; infopubs@aadnc-aandc.gc.ca

ᐱᔪᐊᑎᖏᑐ: **ᐊᑦᖁᑭᐊᖅᑕᐅᓂᒪᔪᖅ ᑭᖑᓪᓕᖅᐸᒥᑦ ᓇᓚᖕᓂᐅᔪᒍᑦ ᐅᓂᒃᑲᓕᐊᓂᒃ ᓄᓇᕗᑦ ᐊᖏᑎᓕᕐᓱᓕᖅᑐᑦ ᑲᑎᒪᔨᖏᑦᑕ ᖁᐅᓴᖅᓯᓂᑦᓴᖏᓐᓂᒃ ᑕᐅᔪᓐᓇᖏᑐᒃ ᐊᑦᖁᑭᐊᖅᑕᐅᓂᒪᔪᖅ ᑭᖑᓪᓕᖅᐸᒥᑦ ᐃᓚᖕᓂᐅᑎᓂᒃ ᑲᑎᒪᔨᖏᑦᑕ ᖁᐅᓴᖅᓯᓂᑦᓴᖏᓐᓂᒃ ᑕᐅᔪᓐᓇᖏᑐᒃ ᑕᐅᔪᓐᓇᖏᑐ

ᐋᓪᓂᕐᓂᐅᕐᓴᒥᐅᖅ ᐅᓂᒃᑲᓇᕐᓗᑎᒃ ᑲᑎᒪᔨᓄᑦ ᐃᓕᓴᕐᓂᐊᕐᓗᒍ ᐱᓕᕆᔨᐅᑉᐹᖓᓂᒃᑯᓐᓇᕐᓂᖅ ᐃᓐᓇᑦ 12, ᐃᓕᓐᓄ 12.5.7(e) ᐊᒋᔪᑦ ᑕᐃᑲᓐᓄᑦ *ᓄᓇᕗᒻᒥ ᐊᖏᕐᕕᑎᓂ*, ᓇᓗᓇᐃᒃᓴᓕᒍᑎᒃ ᒥᓂᑦᑕ ᓇᓂᓴᕆᐅᕐᓂᖏᕐᓂᓂᒃ ᑦᓂᓇ 2016ᒥ ᑭᖑᓕᒃᑯᒥᑦ ᐋᓕᓚᕐᓂᐊᕐᓴᖅ ᐊᒥᑦᑐᐊᕐᓂᖏᓂᒃ ᑕᑦᓕᒪᓂᑦ (5) ᐱᑦᓗᐊᑕᐅᔪᓂᒃ: ᑐᑕᑕᓚᓂᕐᓗᑦ ᓄᓇᒥᐅᑕᓂᓗ ᓂᕿᓚᑦ; ᐃᒪᕈᐊᐅᓕᓚᓂᕐᒥᑦ, ᑕᓚᐊᕐᐅᑕᕆᓕᓚᓂᕐᒥᑦ; ᐃᒪᐅᐸ ᐱᐅᓂᓚᖑᓚᓂ (ᓄᓇᒥ ᖃᐅᖑᓂᓗ); ᐊᒻᒪ ᓯᕆᕕᓚᓂᕐᓗᑦ ᐊᐅᑎᕕᓚᓂᕐᓗᑦᓐᓗ.

ᓄᑦᖯᔪᖅᑎᓚᓂᕐᒥᑦ ᑲᑎᒪᓕᑦ ᖃᐅᔨᓴᕿᓂᓚᖑᖓᓂ ᑲᒪᕈᑯᖅᖃᓂᕐᓗᑦ ᑭᒃᑯᓂᖓ ᐊᒥᑕᓗᐊᕐᕕᔨᓯᒪᓂᕐᒧᓂᑐᒃ, ᑲᑎᒪᓕᑦ ᑐᓴᕐᓂᖅᑐᑦᑐᖅ ᖃᐅᔨᓴᕿᓂᓚᖑᓚᓂ, ᐅᖃᐅᔨᓴᕿᓂᖓᓂᒃ ᑐᓴᕿᖅᓯᒪᔪᓂᑦ, ᐅᖃᐅᔨᓴᕿᓂᖓᓂᒃ ᐃᓐᓇᑦ ᑲᒪᕈᑯᖅᖃᓂᕐᓗᑦ ᐅᓇᓱᓕᓚᓂᕐᒧᓂᑐᒃ, ᑲᑎᒪᓕᑦ ᐊᑐᓕᖅᑐᓂᒃ ᐊᑐᓕᖅᑐᓂᒃ ᐃᓐᓇᑦ ᑲᑎᒪᓕᑦ

ᐊᓗᑭ ᑯᕐᑎᖅ, ᐊᖏᓚᐸᖅᑲᖅ, ᓄᓇᕗᑦ ᑐᖏᓚᐃᔭᕐᓂᓄᑦ
ᓱᒋᓐᓂ ᐊᓇᐸᓪᓕᒃ, ᐊᖏᓚᐸᖅᑲᖅ, ᖃᑎᖏᑕᐅᑦ ᐃᓄᐃᑦ ᑲᑐᔪᖅᑎᑦᑎᐊᕐᓂᓕᕐᓂᑲᒃ
ᒡᒪᔪ ᖃᑲᐸᓗᐊᓪ, ᐃᑲᓱᐊᐅᑕᖅ, ᓄᓇᕗᓴᒥ ᐃᒪᓕᓪᓚᕐᑲᑦ ᑲᑎᒪᔨᖏᕐᓂᓄᑦ
ᐳᑉᔪ ᒥᑲᓗᐃᑦ, ᐊᖏᓚᐸᖅᑲᖅ ᐊᓯᒪ ᑐᑭᒧᐊᑲᑎᕐᓂᔪᓚᓪᒃ, ᓴᐃᓇ ᑲᓐᓄᑲᒃ ᐊᓯᒪ ᖃᖅᑐᑦᓕᓂᖅ ᑯᐊᐸᕆᓴᐅᑦ
ᐃᒪᐅᐅ ᐱᑲᑦ, ᐊᖏᓚᐸᖅᑲᐸ ᑐᖏᓕᐊ ᐊᐋᑎᓕᓚᓂᕐᒧᑦ ᑲᒪᕿᑎᐊᓂᕐᒧᑦᓕᓗ, ᓴᐃᓇ ᑲᓐᓄᑲᒃ ᐊᓯᒪ ᖃᖅᑐᑦᓕᓂᖅ ᑯᐊᐸᕆᓴᐅᑦ
ᐄᐊᓐᓂᖏᓪᓗᒥ ᐱᓕᓚᐊᐸᖅᒧᑦ ᐊᑎᖃᖅᑕᐅᔪᑦ

LETTRE D'ACCOMPAGNEMENT

No. de dossier de la CNER: 12MN036

18 juillet 2017

L'honorable Carolyn Bennett
Ministre des Affaires autochtones et du Nord
10 Rue Wellington, 21e étage
Gatineau, QC K1A 0H4

Envoyé par courriel et par messager: minister@aadnc-aadnc.gc.ca; carolyn.bennett@canada.ca; infopubs@aadnc-aandc.gc.ca

Objet: Rapport révisé de l'audience finale organisée dans le cadre de l'évaluation de la proposition de projet de mine d'or à la rivière Back de la Sabina Gold & Silver Corp., par la Commission du Nunavut chargée de l'examen des répercussions.

Madame la Ministre Bennett,

Conformément à la compétence qu'elle peut exercer en vertu de l'article 12, chapitre 5, de *l'Accord entre les Inuit de la région du Nunavut et Sa Majesté la Reine en Chef du Canada (*l'*Accord du Nunavut,*) la Commission du Nunavut chargée de l'examen des répercussions (CNER ou la Commission) est heureuse de vous soumettre le rapport révisé ci-joint de l'audience finale portant sur la proposition de projet de mine d'or à la rivière Back, de la Sabina & Silver Corp. (le promoteur), no. de dossier 12MN036 de la CNER (le projet). Ce rapport révisé repose sur l'examen initial du projet réalisé par la CNER entre 2012 et 2016 et qui s'est soldé par la publication du rapport 2016 de l'audience finale, soumis à la ministre en juin 2016. Étant donné ses inquiétudes quant aux incertitudes et à la possibilité d'importantes et néfastes répercussions écosystémiques et socioéconomiques, la Commission avait initialement recommandé que le projet ne soit pas autorisé à aller de l'avant

Le 12 janvier 2017, les ministres compétents ont renvoyé le rapport 2016 de l'audience finale à la Commission, pour examen supplémentaire au titre de l'article 12, paragraphe 12.5.7(e) de *l'Accord sur le Nunavut*, soulignant que le rapport comportait des lacunes dans cinq secteurs importants : les caribous et d'autres espèces de la faune terrestre, les poissons, les

environnements d'eau douce et marin, la qualité de l'eau (souterraine et de surface), le climat et la météorologie.

Pour compléter son examen afin de remédier à ces insuffisances, la Commission a demandé des renseignements supplémentaires au promoteur, a sollicité des commentaires auprès des intervenants, des membres de la collectivité et a organisé une audience finale complémentaire. de la population. Basé sur le rapport 2016 de l'audience finale, ce rapport révisé offre en outre un résumé de tous les renseignements fournis à la Commission tout au long de cet examen, incluant les renseignements qui lui ont été fournis avant et pendant les deux audiences finales.

À la lumière des améliorations substantielles apportées au projet et des mesures associées en matière d'atténuation, de gestion et de surveillance des répercussions, la CNER est désormais convaincue que le projet peut être autorisé à aller de l'avant jusqu'à la phase de règlementation. Ayant décidé que le projet devrait à présent être réalisé, la CNER a également inclus dans son rapport des recommandations aux ministres compétents, concernant les modalités et conditions jugées indispensables pour que le projet soit développé conformément aux objectifs énoncés à l'article 12, paragraphe 12.2.5 de *l'Accord sur le Nunavut*. En conséquence, la Commission vous soumet ce rapport révisé de l'audience finale avec les modalités et conditions recommandées aux fins d'examen et de décision, conformément à l'article 12, paragraphe 12.5.7 de l'Accord sur le Nunavut.

En cas de question ou de précisions concernant ce dossier, n'hésitez pas à communiquer avec Ryan Barry, directeur général de la CNER au (867) 983-4608 ou rbarry@nirb.ca.

Dans l'attente, je vous prie d'agréer l'expression de mes sentiments les meilleurs.

Phillip (Omingmakyok) Kadlun
Président du Comité de la proposition de projet de mine d'or à la rivière Back (P5)
Commission du Nunavut chargée de l'examen des répercussions

cc: L'honorable Dominic Leblanc, ministre des Pêches et Océans et de la Garde côtière canadienne, G.C.
L'honorable Jim Carr, ministre des Ressources naturelles, GC
L'honorable Marc Garneau, ministre des Transports, GC
L'honorable Hunter Tootoo, député fédéral pour le Nunavut
L'honorable Peter Taptuna, Premier Ministre du Nunavut
Aluki Kotierk, président, Nunavut Tunngavik Incorporated
Stanley Anablak, président, Kitikmeot Inuit Association
Thomas Kabloona, président, Office des eaux du Nunavut
Bruce McLeod, président et chef des opérations, Sabina Gold & Silver Corp.
Matthew Pickard, VP Environment and Sustainability, Sabina Gold & Silver Corp.
Liste de distribution Back River

CHAIRPERSON'S FOREWORD

As required by Article 12, Section 12.5.6 of the *Nunavut Agreement* and the referral of the Nunavut Impact Review Board's (NIRB or Board) 2016 Final Hearing Report[1] back to the Board by the Responsible Ministers under Article 12, Section 12.5.7(e) of the *Nunavut Agreement* for further consideration of the effects assessment associated with five areas noted as deficient, the Board provides the following revised Final Hearing Report. This revised Final Hearing Report is intended to be comprehensive and summarizes the entire assessment conducted by the Board between 2012-2017, and all conclusions and recommendations by the Board with respect to the Back River Gold Mine Project (the Project) as proposed by Sabina Gold & Silver Corp. (the Proponent or Sabina). The revised Final Hearing Report replaces the 2016 Final Hearing Report and has been prepared for the review and consideration of the Minister of Indigenous and Northern Affairs and regulatory authorities with decision-making responsibility for in the Kitikmeot region of Nunavut (the Project).

In addition, the Board hopes this Report is a useful reference for the residents of the Kitikmeot region, Nunavut in general and the communities in the Northwest Territories that could be affected by the Project. The Report outlines the proposed Project, provides a summary of the Project's potential effects, the comments, issues and concerns expressed throughout the Board's review, and the Board's conclusions and recommendations.

Throughout the Board's review of the Project, the Board's views were informed by important contributions from Elders, students, the Proponent, formal Intervenors and Community Representatives from the Kitikmeot region including Cambridge Bay, Kugluktuk, Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), Gjoa Haven, Taloyoak and Kugaaruk, as well as representatives from the Northwest Territories communities of Behchokǫ̀, Dettah, Łutsel K'e and Wekweètì, all of whom generously shared their stories, opinions, experiences and expertise throughout the process and during both public hearings. The Board cannot do our work without the heartfelt, positive and respectful contributions of all to our process and we are grateful to everyone who participated.

The Board is aware that there may have been surprise and even disappointment for those supportive of the Project when the NIRB issued the 2016 Final Hearing Report in June 2016 and recommended that the Project should not be allowed to proceed based on concerns about the potential for the Project to have significant and lasting effects on caribou and other terrestrial wildlife, fish, freshwater and the marine environment, and adverse socio-economic effects associated with these ecosystemic effects. As noted in the discussion of these key issues in the 2016 Final Hearing Report, based on all information provided to the Board in the assessment up to that point, the Board noted several important uncertainties and a lack of confidence that some of the mitigation, management and monitoring measures proposed by Sabina and various Intervenors could be effective in preventing potentially significant and lasting effects to the pristine and relatively untouched area surrounding the Project.

While some may have viewed the Minister's referral in January 2017 of the 2016 Final Hearing Report back to the NIRB for further consideration in respect of the five (5) areas identified by the Minister as deficient as a "failure" of the regulatory system, the Board, the Proponent and the vast majority of participants in the Board's supplemental Final Hearing very much viewed the Minister's referral as Nunavut's regulatory system functioning as it should. The Board's further consideration in respect of

[1] See NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report)

caribou and terrestrial wildlife, the freshwater aquatic environment, the marine environment, water quality (ground and surface), and climate and meteorology allowed all participants to address critical information gaps, reduce uncertainty, address outstanding concerns and increase overall confidence that the potential for effects of the Project can be limited, mitigated and managed effectively.

In addition, the participants also seized this opportunity to reconsider the previous effects assessment to greatly improve the monitoring program for the Project and define with clarity the thresholds that will be used to trigger various new adaptive management measures. These efforts have greatly increased the Board's confidence that with the significant improvements and added clarity in Sabina's adaptive management program, especially with respect to terrestrial wildlife, including caribou, this program will truly be protective of terrestrial wildlife and reflects the stringent standard of the precautionary approach that is applicable to this area.

The Board commends Sabina, the formal Intervenors and the Community Representatives from the Kitikmeot and Northwest Territories for their collaboration and commitment over these past 13 months to not only providing additional information to the Board to address these key areas, but also to making great strides to improve the effects mitigation, management and monitoring measures proposed. All participants can be proud of the development of some of the "best in class" caribou protection measures that Nunavut has ever seen. However, the Board notes that leading edge plans alone are insufficient to ensure sustainable development. Sadly, as noted by several Community Representatives during both public hearings, nice words are not enough and if Sabina's important commitments, plans and programs are not implemented, the effects could be equally as devastating as if no plans were in place at all. Consequently, in recommending that the Project should now be allowed to proceed on the strength of the additional information provided and Sabina's greatly improved plans, the Board has recommended more than 90 terms and conditions the Board considers to be necessary to ensure that the Project is developed, operated and reclaimed in a protective, collaborative, and precautionary manner. In the Board's view these recommendations ensure that the environment can be safeguarded while still delivering significant and lasting positive socio-economic benefits to the Kitikmeot and adjacent communities in the Northwest Territories.

The Board also wishes to recognize the collective efforts of Sabina, the Kitikmeot Inuit Association, Elders, harvesters and community members to ensuring that Inuit Qaujimaningit and Traditional Knowledge contributions have been incorporated into this assessment in a meaningful way. The Board encourages Sabina to ensure this important information continues to inform the Project throughout all phases of the Project, and, in particular, to ensuring that this information is considered in the updates to mitigation, management and monitoring programs as the Project progresses.

The Board thanks all the federal, territorial and local government representatives, the Kitikmeot Inuit Association, the formal Intervenors from the Burnside, Kugluktuk and Umingmaktok Hunters and Trappers Organizations, the Łutsel K'e Dene First Nation, North Slave Métis Alliance and Yellowknives Dene First Nation, the Elders, students, Community Representatives from Nunavut and the Northwest Territories and members of the public who participated throughout the Board's review; the Board's decision and recommendations are as much a product of your contributions as the Board's. We are always humbled by, and grateful for your commitment and support of the Board's work.

Sincerely,

Phillip (Omingmakyok) Kadlun
Chairperson of the Back River Gold Mine Project Proposal Panel (P5)
Nunavut Impact Review Board

IKHIVAUTALIUP HIVUNIKHAA

Pitquyauhimayutut Ilanga 12-mit, Ilangani 12.5.6 talvani *Nunavunmi Angirutinit* pitquhimayaitullu Nunavunmi Avatiliqiyit Katimayiit (NIRB-kut imaaluuniit Katimayiit) 2016-mi Kingulliit Katimayut Naunaitkutait[2] Katimayinut Ministauyunit titiraqhimayutut ataani Ilanga 12, Ilangani 12.5.7 talvani *Nunavunmi Angirutinit* ihumaliuqtauyughat taapkua qauyihautit ihuilutinik taapkununnga tallimanut ilittuqhitiyauhimayut hivuani huinnamik, Katimayiit taapkua tunihivut titiratqighimayunik Kingulliit Katimayut Naunaitkutainik. Hapkua titiratqiktauhimayut Kingulliit Katimayut Naunaitkutait ilitturinnaqtughauyut naunaiqhitiplunilu tamangnik qauyihautinik iniqtauhimayut Katimayinit 2012-mit 2017-mut, tamangniklu qanurininganiit pitquyauhimayullu Katimayinit Hanningayumi Kulunik Uyaraghiuqvighami (Tughiraqtuq) mighaagut tughirautauyutut Sabina Kuluit Haviillu Kuapuriissanit (Tughiraqtuq taapkualuuniit Sabina-kut). Titiratqiktauhimayut Kingulliit Katimayut Naunaitkutait himmautauyut taapkununnga 2016-mi Kingulliit Katimayut Naunaitkutainik titiraqtauhimayut ihivriuqtauyughat ihumaliuqtaghaillu Ministam Nunaqaqqaaqhimayunik Ukiuqtaqtumiullu Ikayuqtianit ataniqtuqtuiyunillu ihumaliuqtinit Qitiqmiuni aviktuqhimayumi Nunavunmi (Havaaghaq).

Ahiagullu, Katimayiit taapkua Naunaitkutait ihuaqutauquyait nunallaaqmiunut Qitiqmiuni, Nunavunmilu tamaat nunallaaqnilu Nunattiami ihuilutiqarniarahugiyauyut Havaaghanit. Naunaitkutanit ilittuqhitivaktuq tughirautauyumik havaaghanik, ilittuqhitivaghuni Havaagham ihuilutiginahuqquuqtainik, uqauhirnik, ihumaaluutiniklu ilittuqhitiyauhimayut Katimayiit ihivriuqhitillugit, Katimayiillu kingulliit uqauhiit pitquhimayaitalu.

Katimayiit ihivriuqhitillugit Havaaghanik, taapkua Katimayiit ihumagiyainut ilittuqhitiyauvaktut aghuurnaqtunit ikayuutainik Iniqnirinit, ilihaqtunit, Havakvighamit, Nutqaqtittiyinit Nunallaaqmiunillu Kivgaqtiinit Qitiqmiuni aviktuqhimayumit taapkualu Iqaluktuuttiaq, Qurluqtuq, Umingmaktuuq, Qingauq, Uqhuqtuuq, Taluryuaq Kuugaearyuklu, kivgaqtiniklu Nunattiamit nunallaaqnit Behchokǫ̀-mit, Dettah, Łutsel K'e Wekweètì-millu, tamangnik ikayuttiaqhimayut unipkaaqhutik, ihumagiyainnik, ilihimaliqtainik ayuitainiklu havaaritillugit tamangnillu katimaviinit. Katimayiit hapkua havaaghainik iniqhilaittut mihingnautaittumik, inuuhiqattiaqhutik arligiplutiklu ikayuutaigut tamaita havaaptingnut quyagipluhilu tamaffi ilaugaffi.

Katimayiit taapkua ilihimayut taimaa naahurinnaittumik quklugunaqhiyut mamiahugungnaqhiyullu tuniqhihimayut Havaaghanik taapkua NIRB-kut tunihigamik 2016-mi Kingulliqnik Katimayunit Naunaitkutanik June 2016-mi imaalu taapkua havaaghanit ihuilutauniarahugiyait tuktunut ahinullu nunamiutanut anngutighanut, iqalungnut imariktumiunut taryumiunullu avatiinut, amirnaqtuniklu inuuhiqnut-manighiurniqmit ihuilutinik ilauvaktut uumayut nayugainut. Ilittuqhitihimayutut unipkaariyauplutik hapkua ihumaaluutit talvani 2016-mi Kingulliqnit Katimayut Naunaitkutainit, ihumagiplugit tamaita naunaitkutat tuniyauhimayut Katimayinut qauyihaqtainillu tajjamut, Katimayiit ilitturipkaiyut qaffinik naunaqtunik ihumagiyaghanik imaalu ihuigiyaqaqhutik ihuaqhaitjutainik, ataniqtuqtuiyut munaqhiyullu havauhighainik tughirautauyunit Sabina-kunnit ahiniklu Nutqaqtittiyinik aulattiaqniariaghainik nunariktumi aktuqtauhimaittumilu nunat avatiinik Havakvigham haniani.

Ilangi ilauyut takuyungnaqhiyait Ministam pitquhimayait January 2017-mi taapkuninnga 2016-mi Kingulliit Katimayut Naunaitkutainit NIRB-kunnut ihumaliutqiktaghaitut taapkununnga tallimanut (5) ilittuqhitiyauhimayut Ministamit taimaatut iniqhimaittutut "qutanngatjutaupluni" aulattiarnianut, Katimayinut, havakvighanut amihunullu ilauyunut taapkua Katimayit kingulliinit tuklianik Katimatjutigiplugu

[2] Takulugu NIRB-kut Titirautait Nappa 12MN036 Kingulliit Katimayut Naunaitkutait Hanningayumi Havaaghamut, Sabina-kut Kuluit Haviillu Kuapuriissat, June 15mi, 2016 (2016-mi Kingulliit Katimayut Naunaitkutait)

ihumagiliqtaat Ministam pitquyaitut Nunavunmi aulattiarniqmut piyughatut. Katimayiillu ihumagiyait tuktuit mighaagut nunamiutallu anngutighat, imariktumiutat nayugait, taryumiutat nayugait, immap qanurininga (nunam qaanganit qaanganirmillu), hila hilaliqiyillu uqaqtittihimayait ilauyut tuhaqvigiyumaplugit ilihimayainik, naunaqtut ikighilaarahuaqhugit, ihumaaluutaughaaqtut ilittuqhitilugit naahurinnaqhilugit ihuilutaulaaqtut Havaaghanit ikighilaariamik, ihuaqhaqtaulaariamik munaqtaulaariamingniklu ihuaqtukkut.

Ahiagullu, ilauyut katimatillugit ilittuqhitiquyauvaktut ihumaliuqhimayunik qauyihaqtauhimayunit ihuilutinik taimaa ihuaqhaitjutauniaqtuq munaqhiyut havaaghainik Havakvighanit ilitturittiaqnaqhilugit havakviup atuqtaghait munaqhitjutighat nutaat havauhighat. Hapkua havaangit ihuaqutaukpiaqtut Katimayinut taimaa naahurittiaqtaghanik ihuaqhaihimagamik ilitturinnaqhiplugit Sabina-kut havauhiinit munaqhiniqmik, aghuurnaqtumilu nunamiutanut anngutighanut, tuktunut, hapkua aullaqtitaigut munaqhivaalliqniaqtut nunamiutanik anngutighanik havauhilluatlugu ilittuqhitiuyuq amiriyaghanut atuqpaktainik nunami hamani.

Katimayiit pitquiyut Sabina-kunnut, Nutqaqtittiyinuit taapkualu Nunallaaqmiut kivgaqtiinut Qitirmiunit Nunattiamillu katihimagamik taimaaqtailivakkamiklu atuqtunit 13-nguyunit tatqiqhiutinit naunaiqhitiplugit Katimayiit ihumaalungnaqluaqtunit, havauhiqattiarniqmullu ihuaqhainahuaqhutik ihuilutinik, ataniqtuqtuinahuaqhutik munaqhiplutiklu havaaghainut tughirautainit. Tamangnik ilauyut quviahuutigiyaghait ilangi havaangit “nakuuniqhaugamik” tuktunik munaqhiniqmut havauhighanik Nunavunmi takuyauhimaittunik. Kihimi, Katimayiit parnaiyaqhimayait avaliittumik ihuittut aulattiaqtughanut havaaghanit. Mamianaugaluaq, ilittuqhitiyauhimayuq qaffinit Nunallaaqmiunit kivgaqtiinit katimatillutik tamangnit katimaviinit, uqauhittiat avaliittumik naammanngittut taapkualu Sabina-kut iniqniaqhimayait, parnaiyaqhimayait aullaqtihimayaillu aullaqtihimaitkumik, ihuilutit ikpingnautait ingattaulaaqtut parnaiyautaitkumik. Talvuuna, taapkua Havakvighat aullaqtitaunginnarianiktut hakugingniigut naunaitkutat ahiit tuniyauhimayut taapkualu Sabina-kut parnaiyautait ihuaqhattiaqhimagamik, taapkua Katimayiit avatquanik 90-nguyut uqauhiit maliktaghallu Katimayiit ihariagiyait taimaa Havakvighaq makititauyumaaqtuq, aulapkaqtitauluni ilitquhianullu utiqtitauluni munaqtauyumi, atauttikkuuqtumi, amqhiplutiklu havauhikkut. Katimayiit ihumaigut hapkua pitquyauhimayut avatipitngnut nakurutauyumaaqtut munaqtauyumaaqtut atauttikkut inuuhiqnut-manighiurniqmit ikayuutaulaaqtuq Qitiqmiunut nunallaatlu avatiinyt Nunattiarmi.

Katimayiit ilitariyumayaillu havaangit atauttikkuuqhutik taapkualu Sabina-kut, Qitirmiuni Inuit Katimayiit, Iniqnirit, niqighaqhiuqtit nunallaaqmiullu iliqahiutihimayunik Inuit Qauhimayatuqangit Ilitquhiillu hapkununnga qauyihaqtauyunut nakuyumik. Katimayiit aghuuqpaktut Sabina-kunnut ilittuqhitihimaquplugit Havaanginnik tamangnik havaanginut Havakvingnit, imaalu, puiguqtailiyaghaq, taimaa hapkua naunaitkutat ihumagiyauyughat nutaannguqtiqhimayunit ihuaqhaitjutinit, ataniqtuqtuiniqmut munaqhiniqmullu aullaqtihimayainik Havaaghat aullavalliagumik.

Katimayiit quyagiyait tamangnik kavamatuqanit, aviktuqhimayumit nunallaaqmiunillu kavamanit kivgaqtiit, Qitirmiuni Inuit Katimayiit, Nutqaqtittiyit Qingaungmit, Qurluqtuqmit Umingmaktuumilu Anguniaqtit Naniriaqtuqtillu Katimayiinit, taapkua Łutsel K’e Dene Nunaqaqqaaqhimayut, North Slave Aallait Katimayiit taapkualu Yellowknives Dene Nunaqaqqaaqhimayut, Iniqnirit, ilihaqtut, Nunallaaqmit Kivgaqtit Nunavunmit Nunattiarmillu inuillu ilauyut Katimayiit ihivriuqhitillugit; Katimayiit ihumaliugait pitquhimayaillu iliffi unipkaariyaqhilu taimaa aajjikkutaitut Katimayiit. Ilittuqhitiyauvaktugut, quviagivaghugillu havaatit ikayuutillu Katimayiit havaanginnut.

Titiraqtuq,

Phillip (Omingmakyok) Kadlun
Ighivautalik talvani Hanningayumi Kulunik Uyaraghiuqvik Havaaghainut Tughirautinik Ihivriuqhiyit (P5)
Nunavunmi Avatiliriryuakkut Katimayiit

ᐃᒃᓯᓂᐅᑕᐅᑦ ᐅᖃᐅᓯᕆᔨᖏᑦ

ᒪᓕᒋᐊᖅᖃᓂᖏᑦ ᑭᒃᑯᐊ ᐃᓕᒃᑯᑦ 12, ᐃᓕᖅᖢᓂ 12.5.6 ᑕᐃᒃᓂ *ᓄᓇᕗᒻᒥ ᐊᖏᕐᕉᑎᓂ* ᑐᓴᕆᔨᐅᓂᖏᓐᓄᑦ ᓄᓇᕗᒻᒥ ᐊᓂᑎᓕᕆᓂᑦ ᑲᑎᒪᔨᖏᑦ (NIRB ᐅᕙᓪᓕᐊᓂᓂ ᑲᑎᒪᔨᑦ) 2016ᒥ ᑭᖑᓪᓕᖅᐸᒋᑦ ᐊᓚᓐᓂᐅᔪᒍ ᐃᓂᒃᓂᓂ[3] ᑲᑎᒪᔨᓄᑦ ᐅᑎᖅᑎᑕᐅᓪᓚᓂᒃ ᒥᓯᑕᕆᔨᐅᔪᓂᒃ ᑲᒪᓕᕐᓂᖅᑐᓂᒃ ᐃᓕᒃᑯᑦ 12, ᐃᓕᖅᖢᓂ 12.5.7(e) ᐊᑕᐌᑦ ᑕᐃᒃᓂ *ᓄᓇᕗᒻᒥ ᐊᖏᕐᕉᑎᓂ* ᐃᓱᒪᒋᐅᒃᑐᓂᕆᑯᓪᓚᐃ ᐊᒃᑐᐃᓂᐅᑐᒪᕐᓇᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᖓᓂᓐᓄᑦ ᑐᑭᖓᒪᔪᑦ ᑕᑦᓯᒪᓕᖅᖢᖓᓂᑕᐅᑎᓪᓗᒍ ᐊᒥᓱᓕᐊᖅᓯᒪᓂᖅᓂᖅ, ᑲᑎᒪᔨᑦ ᑐᓂᓯᒪᒃ ᐊᑦᑕᕐᓂᐊᖅᑕᐅᓯᒪᔪᖅᑐᑦ ᑭᖑᓪᓕᖅᐸᒋᑦ ᐃᓕᖅᖢᓂᐅᔪᒍ ᐅᓂᒃᑯᒥᑦ. ᑭᖑᓂ ᑭᖑᓪᓕᖅᐸᒋᑦ ᐃᓕᖅᖢᓂᐅᔪᒍ ᐅᓂᒃᑯᖅ ᑐᐱᔪᓂᖅᓯᑎᑕᐅᓯᒪᓂᕐᒪᖅᑐᖅ ᐊᒻᒪ ᓂᐅᐃᓂᖅᓯᓯᒪᓕᖅᑐᑦ ᑐᓂᓯᔪᓐᓇᖅᑐᑦ ᑕᒪᓐᓇᑦᑐᒥ ᐅᖃᐅᓯᕆᔨᖏᑦ ᐊᑐᓕᖅᑐᑦ 2012ᒥᑦ 2017ᒧᑦ, ᑕᒪᖏᑦᑎᐊᑦ ᑭᖑᓪᓕᖅᐸᖅᓯᐅᑎᑦ ᐊᑐᓕᖅᓯᐅᔪᓐᓇᑦ ᑲᑎᒪᔨᓄᑦ ᑭᓯᓯᒪᓐᓄᑦ ᐄᐊᓂᖅᑐᓄᑦ ᑲᓇᐃᓐ ᑲᑭᓐᓂᖅ ᐅᓴᖏᓐᓂᐊᖏᓐᓇᖅᑐᑦ ᐱᓕᕆᔨᓂᖅᑐᑦ (ᐱᓕᕆᐊᒃᖏᖅ) ᑭᓴᓚᖅ ᑐᓴᕆᔨᐅᓂᖓᓂᓐᓄᑦ ᓴᓇᓐ ᑲᑭᓐᓂᖅ ᐊᒻᒪ ᖃᖏᓯᓪᓚᖅ ᑯᓘᔪᓐᓇᖅᑐᑦ (ᐅᑎᓯᓚᖅᑐᑦ ᐅᕙᓪᓕᐊᓂᓂ ᓴᓇᓐ). ᐊᑦᖁᑭᐊᖅᓯᒪᔪᖅ ᑭᖑᓪᓕᖅᐸᒋᑦ ᐃᓚᓐᓂᐅᔪᒍ ᐅᓂᒃᑯᖅ ᐃᓚᖓᕐᖁᕐᓂᖅ ᑭᓴᓚᖅᑐᑦ 2016ᒥ ᑭᖑᓪᓕᖅᐸᒋᑦ ᐃᓚᓐᓂᐅᔪᒍ ᐅᓂᒃᑯᖅ ᐃᓚᖓᕐᖁᕐᓂᖅᑐᑦ ᐃᓚᓐᓂᐅᔪᒍ ᐅᓂᒃᑯᑦ ᐃᓚᒪᓕᕆᔨᖏᑦ ᐃᓚᖓᕐᖁᕐᓂᖅᑐᑦ ᐃᓚᓐᓂᐅᔪᒍ ᐅᓂᒃᑯᖅ ᐃᓚᖓᕐᖁᕐᓂᖅᑐᑦ ᐃᓚᓐᓂᐅᔪᒍ ᐅᓂᒃᑯᑦ ᐃᓚᒪᓕᕆᔨᖏ

ᐊᒻᒪ ᐊᖏᕆᑕᑎᓪᓗᓂᒃᑐᓂ ᐅᕐᐸᐱᓕᕐᓂᖅᓯᖏᓐᖏᓐᓂᖅ ᑭᒃᑯᐊ ᐊᒃᑐᐃᓂᕐᑕᐅᔪᓐᓇᖅᑐᑦ ᐊᒃᓱᕈᓐᓇᕐᑕᐅᔪᖅᖃᖏᓐᖏᓐᓂᖅ, ᐅᑎᖅᑎᑦᓴᕆᐅᓐᖏᓐᓂᖅ ᑲᒪᕐᔪᐅᕐᑎᐊᖅᖃᐊᖅᖏᓐᖏᓐᓂᖅᓯᓪᓗᓂ.

ᐃᓕᓴᐅᓂᖅᓗᒍ, ᐃᓕᐅᕋᒃᑕᐅᔪᑦ ᐱᕕᖅᖁᑎᑕᐅᓂᖏᓐᓂᖅᓂᖅ ᐃᓱᒪᓴᖅᓯᓱᐅᓕᐅᕋᒥᔪᑦ ᑭᖑᓂᖅᑐᑦ ᖃᐅᔨᓴᖅᖁᓂᖅᓯᒪᓕᕐᓂᖅᓂᖅ ᖃᐅᔨᓴᖅᓂᐅᐅᕙᖅᑐᑦ ᐱᓕᕐᓂᖅᓯᐅᑎᑦᓯᒪᓕᕐᓂᖅᓂᖅ ᐊᑐᖅᑕᐅᑎᓴᖅᑐᓂᖅ ᐅᓴᐅᓯᓱᓂᖅᓂᕆᓂᖅᑐᑦ ᐊᓴᐸᖅᑐᑐᑐᓂᖅ ᐊᐅᓕᐅᔪᑦ ᐃᓕᓴᐅᓂᖅᓂᕆᓂᖅᑐᑦ ᐊᓴᐸᖅᑐᑐᑐᓂᖅ ᐊᐅᓕᐅᔪᑦ ᑕᒪᓐᓇᖅᑐᖅ ᑐᓴᐅᑦ, ᐃᓕᓴᐅᓂᖅᓯᒪᓕᕐᓂᖅᓂᖅ ᑕᒪᓐᓇᖅᑐᖅ ᐊᐅᓕᐅᔪᑦ ᐊᐅᓕᐅᔪᑦ ᑐᓴᐅᑦ ᐃᓕᓴᐅᓂᖅᓂᕆᓂᖅᑐᑦ ᐊᐅᓕᐅᔪᑦ ᐊᐅᓕᐅᔪᑦ ᐊᐅᓕᐅᔪ

AVANT PROPOS DU PRÉSIDENT

Conformément aux exigences de l'article 12, paragraphe 12.5.6 , de *l'Accord sur les revendications territoriales du Nunavut* et suite au renvoi de son rapport 2016 de l'audience finale[4] qui lui a été fait par les ministres compétents en vertu de l'article 12, paragraphe 12.5.7 (e) de l'*Accord sur le Nunavut*, et ce, aux fins de révision de l'examen des répercussions jugé insuffisant dans cinq secteurs, la Commission du Nunavut chargée de l'examen des répercussions (CNER ou la Commission) soumet ce rapport révisé de l'audience finale. Ce rapport révisé qui se veut complet, résume l'examen intégral effectué par la Commission entre 2012 et 2017 ainsi que toutes ses conclusions et recommandations concernant le projet de mine d'or à la rivière Back (le projet), proposé par la Sabina Gold & Silver Corp. (le promoteur ou la Sabina). Ce rapport révisé de l'audience finale remplace le rapport 2016 de l'audience finale et a été préparé aux fins d'examen et de considération par la ministre des Affaires autochtones et du Nord et par les autorités de réglementation ayant pouvoir décisionnel à cet égard dans la région de Kitikmeot au Nunavut (le projet).

La Commission souhaite en outre que ce rapport soit une référence utile pour les résidents de la région de Kitikmeot en général et des collectivités des Territoires du Nord-Ouest susceptibles d'être touchés par le projet. Il dresse les grandes lignes du projet proposé, résume les répercussions potentielles du projet, expose les commentaires, les questions et les préoccupations exprimés tout au long de l'examen par la Commission et inclut les recommandations et conclusions de la CNER.

Tout au long de son examen, la Commission a été éclairée par d'importantes contributions d'aînés, d'étudiants, du promoteur, d'intervenants officiels et de représentants des collectivités de la région de Kitikmeot, incluant Cambridge Bay, Kugluktuk, Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), Gjoa Haven, Taloyoak et Kugaaruk ainsi que de représentants de Behchokǫ̀, Dettah, Łutsel K'e et Wekweètì aux Territoires du Nord-Ouest. Tous ont généreusement raconté leur histoire, dévoilé leurs opinions, leurs expériences et leur expertise tout au long du processus et des deux audiences finales. La Commission ne peut accomplir son travail sans l'apport chaleureux, positif et respectueux de tous les participants à la procédure d'examen; nous leur en sommes extrêmement reconnaissants.

La Commission est consciente qu'en recommandant dans son rapport 2016 de l'audience finale de ne pas autoriser la réalisation du projet en raison de ses préoccupations quant à la possibilité de graves et durables répercussions sur les caribous, sur d'autres espèces de la faune terrestre, sur les poissons, les environnements d'eau douce et marin et vis-à-vis des effets socioéconomiques néfastes inhérents à ces incidences écosystémiques, certains partisans du projet ont été surpris, voire déçus. Dans la section du rapport 2016 portant sur ces enjeux capitaux, la Commission avait relevé à partir des données qui lui avaient été fournies jusqu'alors pendant l'examen, de substantielles et importantes incertitudes ainsi qu'un manque de confiance envers la capacité de certaines mesures d'atténuation, de gestion et de surveillance proposées par la Sabina et divers intervenants, de prévenir efficacement d'importantes et durables répercussions sur la zone vierge et relativement intacte entourant l'aire du projet

Si certains ont considéré que le renvoi par la ministre, en janvier 2017, du rapport 2016 de l'audience finale de la CNER et ce, aux fins d'examen complémentaire des cinq (5) secteurs ministériellement jugés "déficients", prouvait "l'échec" du système de réglementation, la Commission, le promoteur et la vaste majorité des participants à l'audience finale supplémentaire de la CNER ont estimé que ce renvoi

[4] Voir le rapport de l'audience finale, no. de dossier 12 MN036 de la CNER, pour le projet de mine d'or à la rivière Back, de la Sabina Gold, 15 juin 2016 (Rapport 2016 de l'audience finale).

ministériel en démontrait plutôt l'efficience. L'examen supplémentaire effectué en ce qui a trait aux caribous, à la faune terrestre, aux environnements d'eau douce et marin, à la qualité de l'eau (souterraine et de surface), au climat et à la météorologie a permis aux participants de compenser les cruciale lacunes de données, d'atténuer les incertitudes, de régler les préoccupations en suspens et de renforcer la confiance générale quant à la possibilité de limiter, atténuer et gérer efficacement tout potentiel de répercussions du projet..

Les participants ont en outre profité de l'occasion pour revoir l'examen préalable des répercussions afin de bonifier sérieusement le programme de surveillance du projet et de fixer clairement les seuils qui seront appliqués pour déclencher de nouvelles mesures de gestion adaptative. Grâce à ces efforts, la Commission est convaincue qu'avec les substantielles améliorations et les précisions apportées au programme de gestion adaptative de la Sabina, notamment en ce qui a trait à la faune terrestre et aux caribous, le programme protègera réellement la faune terrestre, respectant la rigoureuse norme de l'approche prudente, applicable à cette région

La Commission félicite la Sabina, les intervenants officiels et les représentants des collectivités de Kitikmeot et des Territoires du Nord-Ouest pour leur collaboration et leur participation depuis les 13 derniers mois non seulement en alimentant la Commission de données supplémentaires pour régler le cas des cinq aires principales mais également en faisant de grands progrès pour améliorer les mesures proposées d'atténuation, de gestion et de surveillance des effets éventuels. Tous les participants peuvent s'enorgueillir de la mise sur pied des "meilleures " mesures de protection des caribous jamais élaborées au Nunavut. La Commission a toutefois constaté que les plans avant-gardistes ne suffisent pas à eux seuls à garantir le développement durable. Malheureusement, comme l'ont fait remarquer plusieurs représentants communautaires pendant les deux audiences finales, de belles paroles peuvent s'avérer vaines. En effet, si l'engagement, les plans et les programmes cruciaux de la Sabina ne sont pas appliqués, les conséquences pourront être tout aussi dévastatrices que l'absence de tout plan. Par conséquent, en recommandant que le projet soit autorisé à aller de l'avant sur la base des renseignements supplémentaires fournis et des plans grandement améliorés de la Sabina, la Commission a ajouté plus de quatre-vingt-dix (90) modalités et conditions jugées indispensables pour s'assurer que le projet soit développé, géré et récupéré dans une perspective de prudence, de protection et de collaboration. La Commission estime que ces recommandations une fois appliquées garantiront la sauvegarde de l'environnement tout en dégageant d'importants avantages socioéconomiques durables pour la région de Kitikmeot et les collectivités avoisinantes des Territoires du Nord-Ouest.

La Commission tient aussi à reconnaître les efforts conjoints de la Sabina, de l'Association inuite de Kitikmeot, des Aînés, des exploitants de la faune et des membres de la collectivité pour s'assurer que cet examen ait été judicieusement instruit par les principes Qaujimaningit inuit et par le savoir traditionnel. La Commission encourage la Sabina à veiller à ce que ces principes et ces contributions fondamentales continuent à guider le projet dans toutes ses phases et en particulier qu'ils soient pris en considération dans les mises à jour des programmes d'atténuation, de gestion et de surveillance au fur et à mesure des avancées du projet.

La Commission remercie tous les représentants des gouvernements fédéral, territorial et local, l'Association inuite de Kitikmeot, les intervenants officiels des organisations de chasseurs et de trappeurs de Burnside, Kugluktuk and Umingmaktok, la Première Nation de Łutsel K'e Dene, l'Alliance métis North Slave, la Première Nation de Yellowknives Dene; les aînés; les étudiants; les représentants communautaires du Nunavut et des Territoires du Nord-Ouest et les membres de la population, pour leur participation à cet

examen de la Commission. La décision et les recommandations de la Commission sont tout aussi votre œuvre que celle de la CNER. Nous vous sommes à jamais redevables et privilégiés de votre engagement et du soutien que vous apportez à nos travaux.

Veuillez agréer l'expression de ma considération distinguée.

Phillip (Omingmakyok) Kadlun
Président du Comité de la proposition de projet de mine d'or à la rivière Back (P5)
Commission du Nunavut chargée de l'examen des répercussions

EXECUTIVE SUMMARY

This revised Final Hearing Report and recommendations relate to the Back River Gold Mine Project, NIRB File No.: 12MN036 (the Back River Project or the Project), submitted by Sabina Gold & Silver Corp. (Sabina or the Proponent) to the Nunavut Water Board and the Nunavut Impact Review Board (the NIRB or the Board) in June 2012. The scope of the Project reviewed by the Board and that is the subject of this supplemental Final Hearing involves the development of two (2) main project areas: a gold mine (four (4) mineral deposits to be accessed using open pit and underground methods), mill and associated infrastructure at the Goose Property;[5] and a Marine Laydown Area (MLA) located at Bathurst Inlet. These two (2) areas are proposed to be linked seasonally (January to April) by an approximately 160 km long winter ice road.

As set out in Article 12 of the *Nunavut Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada* (the *Nunavut Agreement*), since 2012 the Board has been engaged in the assessment of the potential environmental and socio-economic effects of the proposed Project to determine whether or not the Project should be allowed to proceed, and if so, on what terms and conditions. Throughout its Review of the Back River Project the Board has been guided by the NIRB's objectives and mandate as set out in Article 12, Section 12.5.5 of the *Nunavut Agreement*.

Between 2012-2016, the Board conducted a thorough assessment of the Project involving the review of a *Draft* Environmental Impact Statement (DEIS) and a Final Environmental Impact Statement (FEIS) submitted by Sabina, numerous written comment periods, community meetings, technical meetings, a Pre-hearing Conference and a Final Hearing held in Cambridge Bay in April 2016. At the end of that process, as indicated in the Board's 2016 Final Hearing Report,[6] the Board was left with concerns, uncertainty and a lack of confidence in proposed mitigations for specific effects, that resulted in the Board concluding that the Project should not be allowed to proceed. The Board had particular concerns about the potential for serious adverse project-induced ecosystemic effects on caribou and other terrestrial wildlife, fish, freshwater and the marine environment and also concerns about the potential for adverse socio-economic effects associated with these ecosystemic effects that could not be reliably and adequately managed and mitigated.

In January 2017, the Minister of Indigenous and Northern Affairs (on behalf of the other Ministers with regulatory responsibility for the Project), referred the 2016 Final Hearing Report back to the Board under Article 12, Section 12.5.7(e) of the *Nunavut Agreement*. The referral required the Board to address and report back to the Minister regarding five (5) key areas of the Board's Report that the Minister considered to be deficient. Upon receipt of the Minister's referral, the Board directed that additional information was required from Sabina and the Intervenors to address the areas of uncertainty identified by the Board in the 2016 Final Hearing Report, specifically the potential for significant adverse effects associated with: caribou and terrestrial wildlife; freshwater aquatic environment; marine environment; water quality (ground and surface); and climate and meteorology.

In response, Sabina filed an Addendum to the Final Environmental Impact Statement (FEIS Addendum) in February and Intervenors provided further written submissions about the FEIS Addendum and the

[5] Approximately 400 kilometres (km) southwest of Cambridge Bay, Nunavut, 95 km southeast of the southern end of Bathurst Inlet and 520 km northeast of Yellowknife, Northwest Territories.

[6] NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report).

areas of deficiency. A technical meeting was conducted by teleconference amongst the parties and a supplemental Final Hearing focused primarily on the areas of deficiency and updated information in the FEIS Addendum was held for four (4) days in Cambridge Bay on May 31-June 3.

As the proposed Project Development Area would be located in an area that overlaps with the ranges of various caribou herds, including the Bathurst herd, that is an important herd for traditional harvesters in several communities in the Northwest Territories and that is jointly managed by the Governments of Nunavut and the Northwest Territories, the Board's assessment of the Project has included engagement and active participation from participants outside the Nunavut Settlement Area. Specifically, the Board has sought the involvement of the Government of the Northwest Territories and the Tłı̨chǫ Government, Yellowknives Dene First Nation, Łutsel K'e Dene First Nation, North Slave Métis Alliance and representatives from Behchokǫ̀, Whatì, Wekweètì, Gametì, N'dilo and Dettah. In addition to receiving representations from transboundary participants throughout the Board's Review, the Board has provided numerous opportunities to participants from federal, territorial and local governments, the Kitikmeot Inuit Association, local Hunters and Trappers Organizations, Community Representatives from each of the seven (7) Kitikmeot communities, Elders, students and members of the general public to share their perspectives about the Project and about the potential effects on communities and the environment.

This revised Final Hearing Report builds onto, updates and replaces the Board's 2016 Final Hearing Report and reflects the significant additions to the effects assessment and important major revisions to the Proponent's proposed mitigation, management and monitoring measures for specific effects that have taken place in the 13 months since the release of the 2016 Final Hearing Report. For those who may have expressed concern that the Board's further consideration of the Project would be a "rubber stamp" only and would not lead to any substantive improvements to the Project, the Board notes that the further consideration was conducted with the same care and thoroughness as the original assessment.

As recognized by the Intervenors and Community Representatives who participated in both the 2016 Final Hearing and the supplemental Final Hearing, Sabina's FEIS Addendum and revisions to the Proponent's plans are substantive and were the product of extensive consultation with Intervenors and communities. As noted by Jayko Palongyak, a Community Representative from Kugluktuk:

> *I think you guys [Sabina] have gone way above and beyond what you have presented at the final hearing. That is good to see. Your program is a lot more in-depth than it was at the original hearing. I think you guys have gone way above and beyond what is being called upon you. We still support Sabina -- Sabina, and we still will. We know your mitigation measures out there are way above and beyond what is being called of you guys.*[7]

The Board also heard a similar message from those Intervenors who participated in both Final Hearings:

> *…when the records from this proceeding is reviewed, … it will show that Sabina has made important changes to the Back River Project. These changes improve environmental protection and reduce the potential for this project to have any impact on the environment. Because of the NIRB process and the hard work of everyone involved, KIA has concluded that a good project has been made better. KIA is satisfied with the mitigation and the*

[7] J. Palongyak, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, p. 1022, lines 16-23.

monitoring programs proposed by Sabina for the Back River Project, including their protection and monitoring plans.[8]

Further, the Board commends the collaborative approach Sabina and all participants took to the Board's additional assessment of the Project and encourages all parties to continue this approach beyond the Board's review. As described by Harry Maksagak:

We are working together for a common cause. We are still respecting people, relationships, the environment, the land, and the animals. We are welcoming industry that is helping Nunavut…

Yes, we have some misunderstands; yes, we have some misgivings. As with any relationship, there's always that breakdown at times because of the lack of proper, clear communication. But now that we've opened that door to communicating from one side of the table to the other side and coming to a common place of understanding of how we're going to do business, I believe we are looking forward to moving ahead to the benefit of the proponent that has brought this proposal to us, but also to the benefit of us that live in the Kitikmeot region.[9]

The Board notes that Sabina's plans would constitute some of the most protective caribou protection measures ever developed for the Arctic. The revisions to the Project and plans are also unique in ensuring that there are clear adaptive management plans in place to prepare for the possibility of the Project overlapping with caribou calving grounds, even though the current caribou calving grounds do not overlap with the Project. In the Board's view, this unique and highly protective approach to adaptive management of the potential for project-induced effects on already declining caribou populations is warranted, as the area surrounding the Project is relatively pristine and untouched by development. In addition, Inuit Qaujimaningit and Traditional Knowledge indicate that caribou used the area in the past for caribou calving and may one day return to the area over the projected 27-year span of the Project (from mobilization to decommissioning).

The 2017 revisions to the Proponent's plans not only improve the potential mitigation of project-induced effects on caribou and other terrestrial wildlife such as grizzlies, Sabina has also proposed significant enhancements and additions to the Project's effects monitoring programs. If fully implemented, this enhanced monitoring greatly increases the Board's confidence that Sabina would have the information necessary to respond rapidly if unpredicted or greater than predicted effects are identified.

At the supplemental Final Hearing, the Board heard that, based on the updated information and substantive changes to Sabina's plans, there was wide-spread support for the Project from all Intervenors, Community Representatives and most members of the public in attendance. Participants noted that the Project represents significant employment and economic opportunities for the people of the region, while being protective of the surrounding environment. The Board also heard that for some

[8] S. Anablak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, p. 1045, lines 5-15.

[9] H. Maksagak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, pp. 1042-1042, lines 14-18 and lines 24-26 and lines 1-8.

Inuit, concern remains about the potential for this Project specifically, and mining projects in general, to have adverse effects on the air, land, water, wildlife and people in the area.[10]

After due consideration of all information provided to the Board throughout the review of the Back River Project, the NIRB has now concluded that the Project may proceed to the licensing and permitting regulatory phase. The information provided during the Board's further consideration of the Project following the Minister's January 2017 referral, has sufficiently increased certainty regarding effects predictions and mitigation measures applicable to limit the potential for significant adverse ecosystemic and socio-economic effects. Having recommended that the Project proceed, as required under Article 12, Section 12.5.6(c) of the *Nunavut Agreement*, the Board has recommended over 90 terms and conditions that should govern the Project going forward, including in key areas such as mitigation, management and monitoring of specified ecosystemic and socio-economic effects. The Board's recommendations are directed at ensuring that the Back River Project is developed, operated and reclaimed in a manner that would not unduly and adversely impact the ecosystemic integrity of the Nunavut Settlement Area.

The Board's conclusions and recommendations were informed by all the information provided by all participants, including their presentations, questions and comments provided at both final hearings, the extensive documentation filed during the screening and review of this Project, correspondence filed with the Minister in response to the Board's 2016 Final Hearing Report and the Inuit Qaujimaningit, Traditional Knowledge and the information contained within the *Draft* and Final Environmental Impact Statements and the FEIS Addendum filed by Sabina. The Board's conclusions and recommendations as expressed in this revised Final Hearing Report are the product of the Board's thorough review of all the information presented. The Board is grateful to all who shared their experiences, opinions and expertise to comment on the Project throughout the Board's review of the Project.

The Board echoes the sentiment that the hard work of Sabina, the Board and all contributors to the assessment of the Project since 2012, have resulted in a much improved, highly protective and leading-edge mining project. If Sabina complies with their commitments and the Board's recommended terms and conditions, the Board is now optimistic the Project will represent a model of sustainable development that protects the ecosystemic integrity of the region, integrates Inuit Qaujimaningit and Traditional Knowledge into the Project on an on-going basis, and delivers significant and sustained socio-economic benefits to Nunavummiut, as well as our neighbours in the Northwest Territories.

[10] See the remarks of J. Angulalik, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, pp. 776-785.

AULAPKAIYINI NAITTUQ

Una ihuarhaqhimayuq Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq uyarakhiurvikquyauyullu piyut uumunnga Hannigayuq Gold-mik uyarakhiuqtut Havauhikhaq, NIRB Naunaitkutinga Nampaa: 12MN036 (una Hannigayuq Havauhikhaq uuminngaluniit Havaariyakhaa), turaaqtigiyait Sabina Kuulu Havigalik Kuapuriisan (Sabina uuminngaluuniit Havaakhaliuqtunut) uvunga Nunavut Imaliqiyit unalu Nunavut Avatiliqiyit Katimayiit (NIRB Katimayiitaluuniit) uvani Imaruqtirvia 2012 mi. Aktikkulaanga Havauhikhaq ihivriuqtauyuq Katimayiinnit uqaqtauyuq uumannga ilakunga Kingulliqpaanga Tuhaqtipkaidjut ilauyuq piliurninnga malruuk (2) havauhikhalluangani: gold-mik uyarakhiurvik (hitamauyut (4) uyarak ilakunga ihivriuqtauyukhaq atuqtuq angmaumayuq uyarakhiurvik nunap ataani qanuriliurutit), havakviuyuq piyunullu aulapkaitjutikhanik Goose Uyarakhiurvingani;[11] unalu Tariuqmi Iliuraqhiqvinga (MLA) ittuq Qingaukmi. Tahapkuat malruk (2) ininga havaariyauhimayangit ilagivlugillu ukiungani (Ubluqtuhinia mit Qitiqqautiyuq) 160 km tahilaangit ukiumi apquliuqtauvaktuni.

Piliurhimayuq Titirarhimaninga Angirutiup 12mi uumani *Nunavut Angirutinga Ukunanit Inuit uumannga Nunavut Nunagiyangani Kuinlu Pilaqutingani Kaanatap* (*Nunavut Angirutinga*), 2012mit Katimayinga ilauyuq ihivriuqtuq avatiliriniqmut inungnut ikayuutikhait qanuriliurutingit Havauhikhaq naunairiami tamna Havauhikhaq piyukhaqtuq, taimaalu, kitut atuqtauvaktunut qanurittaakhainganinginnullu. Ihivriuqtillugu Hannigayuq Havauhikhaq Katimayiingit munariyauyuq NIRB-kut tikinnaqhuaqtangit pitquyangit piliurhimayuq uumani Titirarhimaninga Angirutiup 12, Ilangani 12.5.5 uumani *Nunavut Angirutinga*.

2012mit-2016mut, Katimayiingit ihivriuqtangit una Havauhikhaq ilauyuq ihivriuqninnga *Iniqhimaittuq* Avatiliriniqmut Pilaqtutinga Naunaitkutaq (DEIS) unalu Kingulliqpaaq Avatiliriniqmut Pilaqtutinga Naunaitkutaq (FEIS) tunihimayuq Sabina-mit, qaffinik titiraqhimayut qanuqtut ihumagiyamiknik, nunallaani katimapkainiq, ayuittiaqniqmut katimaniq, Katimatinnagit Katimapkaiyuq unalu Kingulliqpaanga Tuhaqtipkaidjut Iqaluktuutiami Qitiqqautiyuq 2016. Nunguvingani havaaq, naunaiqhimayuq Katimayiingit 2016 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq,[12] Katimayiingit ikhinnaqtauyut ihumaalutiqaqtumik, ilihimangittuq piqalluangittumik ilihimaninnga ikikliyuumiutihimayuq ihuaqtunut qanuriliurutingit, pipkaidjutiyut Katimayiingit ilaliutihimayuq tamna Havauhikhaq pipkaidjutigiyakhangittuq. Katimayiingit ihumaaluktut hivituyumik nakuungittumik havauhikhaq-pipkaidjutihimayuq anirhaaktaptiknik imanga uyarak nuna pipkaidjtiyut tuktunut aadlanit nunami huradjat, iqaluk, imanga unalu tariuqmi avatinga ihumaalutigiyauyullu nakuungittumik inungnut ikayuutikhait ayurhautingit piyut avatiptiknit pipkaidjutauyut pilimaittuq ihuaqtumiklu munariyauyuq ikikliyuumiqhimayuqlu.

Ubluqtuhinia 2017, Ministauyuq Nunaqaqqaarhimayuq unalu Ukiuqtaqtumi Pilaqutingit (pitqutigiquplugu aadlat Ministait munariyuq Havauhikhamut), piyuq uumunnga 2016 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq uumunnga Katimayiingit uumani Titirarhimaninga Angirutiup 12, Ilangani 12.5.7(e) uumani *Nunavut Angirutinga*. Nuutiqninnga ihariagiyauyuq Katimayiingit ihuarhigiami unalu Taiguagakhaq Ministamut piyuq tallimanik (5) akhuurutauyut uuminnga Katimayiingit Taiguagakhaq Ministaup ihumagiyauyuq nakuungittut. Pikmagu Ministaup nuutiqtiqninnga al, Katimayiingit pitquyaat aadlamik naunaitkutaq ihariagiyauyuq ukunannga Sabina unalu Ilaupkaiyuq ihuarhigiami talvani ilihimangittut ilitariyauyuq Katimayiinginnit uumani 2016 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq, unalluaq pinahuariniaqtuq akhuuqtuq nakuungittuq qanuriliurutingit piyut uumunnga: tuktut ukuatlu maniqqamilu huradjat; tariuqmiutat tariup avatinga; tariuqmi avatinga; imanga qanurittaakhaanik (nunami qaanganilu); anuringa anuri qanurittaakhaaniklu.

[11] Huqpaniitungnaqhiyuq 400 kilamiitastigut (km) hivuraanit uataani Iqaluktuuttiarmit, Nunavunmi, 95 km ungahilaanga hivuraanit kivataanit kiglingani Kingaungmit, unalu 520 km tunngana kivataanit Yalunai, Nunatsiamit.

[12] NIRB Naunaitkutinga Nampaa 12MN036 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq uminnga Hannigayuq Havauhikhaq, Sabina Gold unalu Silver Kuapariisinga, Imaruqtirvia 15, 2016 (2016 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq).

Kiudjutingit, Sabina piliuqtuq Ilaliutihimayuq ukununnga Kingulliqpaaq Avatiliriniqmut Pilaqtutinga Naunaitkutaq (FEIS Ilaliutihimayuq) Iidjirurviani unalu Ilaupkaiyuq tuniyauyuq aadlani titiraqhimayuq tuniyauyuq uumunnga FEIS Ilaliutihimayuq piqalluangittumi. Ayuittiaqtumik katimapkaiyut hivayautikkut ilauyunit unalu aadlamik Kingulliqpaanga Tuhaqtipkaidjut ihumagilluaqtaa hivulliqpaami piqalluangittumi nutaanguqtiqhimayumiklu naunaitkutanga FEIS-mit Ilaliutihimayuq hitamanik (4) ublunik Iqaluktuutiaqmi Qiqaiyaluarvia 31-Imaruqtirvia 3.

Taimaa pinahuaqtuq Havauhikhaq Pivallianinngani naunaiqniaqtuq talvani qaliriiktunik aadlatqiinik tuktut amihuaryuit, unalu Qingaup Tuktungit, ihariagiyauyuq tuktut qangaraaluknitanut angunahuaqtiuyut qaffiuyuni nunallaani Nunatsiaqmi atayumik munariyauyuq ukunanit Nunavut Kavamanganit Nunatsiaqmillu, Katimayiingit ihivriuqniq Havauhikhaq ilaliutiyuq ilauniq akhuraaluklu ilauniq ilauyunit hilataani Nunavut Nunagiyangani. Ihuaqtumik, Katimayiingit qiniqtaa ilauniq Nunatsiap Kavamanganik unalu Tłı̨chǫ Kavamanga, Yalunaimiutat Aadlait, Łutsel K'e Aadlait, North Slave Métis Katimayiingit ilauyullu uumannga Behchokǫ̀, Whatì, Wekweètì, Gametì, N'dilo unalu Dettah. Pigiami ilauyut kiklinganit ilauyut tamainni Katimayiingit Ihivriuqniq, Katimayiingit tuniyauyuq qaffiuyunik pivikhaqautikhanik ilauyunut kaanatami, avikturhimayumi nunamiknilu kavamangit, tamna Kitikmeot Inuit Katimayiit, An'nguhiqiitkut Timiqutigiyangit, Nunallaani Ilauyut saivanit (7) Kitikmeonmi nunallaangit, Inirniriit, ilihaqtut inuillu uqariamiknik qanuqtut ihumagiyanganik Havauhikhamut qanuriliurutauniaqtuqlu nunallaanut avatinganullu.

Una ihuarhaqhimayuq Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq piliuqtuq talvunga, nutaanguqtuq himmiqtaalu Katimayiingit 2016 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq naunaiqtaalu akhuurutauyuq ilaliutinga uumunnga qanuriliurutingit ihivriuqniq akhuurutauyut angiyut ihuarhaffaarniq Ikayuqtiuyup ikikliyuumiutikhanga, atan'nguyauniq munariniqlu ihuaqtunut qanuriliurutingit piyait taimaa 13nik tatqirhiutinik angmaqmagu 2016 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq. Tahapkununga uqaqtait ihumaalutinik Katimayiingit aadlanik ihumagiyakhaq Havauhikhamut inniaqtuq "angiriami" talvainnaq pilimaittuqlu ihariagiyauyuq ihuarhaininnga Havauhikhamut, Katimayiingit naunaiqtaa aadlamik ihumagiyut piyait aadjikutaanik munariniqmik hivulliqpaamit ihivriuqniq.

Ilitariyauyuq uumannga Ilaupkaiyuq Nunallaanilu Havaktut ilauyut tamarmikmi 2016 Kingulliqpaanga Tuhaqtipkaidjut aadlalu Kingulliqpaanga Tuhaqtipkaidjut, Sabinaup FEIS Ilaliutihimayuq ihuarhaffaarninngillu Ikayuqtiuyup ihumaliuqtangit angiyut piyut hivituyumik uqaqatigiikniq ukununga Ilaupkaiyunik nunallaaniklu. Naunaiqtauyuq Jayko Palongyakmit, Nunallaami Havaktiuyuq Kugluktumit:

> *Ihumagiunga iliffi [Sabina] piyut akhuraaluk tuniyaqni uumani Kingulliqpaanga Tuhaqtipkaidjut. Taimaa tautugiami nakuuyuq. Pinahuarutit hivitutqiaq hivulliqpaamit tuhaqtipkaininnganit. Ihumayunga iliffi qulaanut qaangiqhimayatittauq tuhaqtittihimayaffi. Ikayuqniaqtavut Sabina – Sabina, ikayuqhimmaaqniaqtavullu. Ilihimayavut ingattaqhittailinahuaqtaqhiuk uuktuutingit qulaanngat qaangiqpiaqhimayaqhiuk niplautigiyaptik iliptik.*[13]

Katimayiingit tuhaayullu aadjikutamik uqaqtakhaq tahapkunanit Ilaupkaiyuq ilauyut tamarmikni Kingulliqpaanga Tuhaqtipkaidjut:

> *…naunaitkutingit uumannga pihimmaaqtumit ihivriuqtaukpat, … naunaiqniaqtaa Sabina akhuuqtumik aadlanguqtiqtait uumunnga Hannigayuq Havauhikhaq. Hapkuat aadlangurninngit ihuarhiyaa avatinganik hapummiutinganik ikikliyuumiqhugu piniaruknaqhiuyuq uumunnga havauhikhaq pilaqutiqariami avatinganut. Taimaa NIRB havaanga akhuraaluklu havakmata inuit tamaita ilauyunit, KIA ihumagiyut nakuuyuq havauhikhaq nakuutqiyauliqtuq. KIA*

[13] J. Palongyak, Kugluktuk, NIRB aadlamik Kingulliqpaanga Tuhaqtipkaidjut Naunaitkutinga Nampaa 12MN036 Aadjikutaliurhimayuq, Imaruqtirvia 3, makpirvia. 1022, titiraqhimaninngani 16-23.

quviagiyait ikikliyuumiutinganik munarininngalu pinahuarutit pinahuaq Sabina-mit uumunnga Hannigayuq Havauhikhaq, hapummiutingillu munariniqmullu ihumaliurutingit.[14]

Aadlalu, Katimayiingit nan'ngariyaa havaqatigiikniqmut piyut Sabina tamaitalu ilauyut piyut Katimayiingit aadlat ihivriuqniq uumannga Havauhikhaq akhuuquyaillu tamaita ilauyut pihimmaaqluni una qanuriliurutiyauyuq uumunnga Katimayiingit ihivriuqniq. Naunaiqtanganik Harry Magsagak:

Havaqatigiiktugut nakuuyumik pigiami. Pimmariktumik piyavut inuit, piqatigiikniq, avatinga, nuna, huradjallu. Tunngahuktittavut havakviit ikayuqtuq Nunavunmut…

Hii, ulapiqutiqaqtugut; hii, ihumaalutiqaqtugut. Aadjikutaa piqatigiikniqmik, piqainnaqtuq nutqaqtiqtiniqmik ilaani taimaa piqalluanginmat ihuaqtumik, naunaittumik uqaqatigiikniq. Kihimi tadja angmaraptitku ukkuanga uqaqatigiiniq aippaanit ikpatimit aippaamut qaiyurlu ihumaliurutinga kangirhiniqmik qanuqtut havaariniaqtavut, ihumayunga niriuktugut hivumuuriami ikayuutikhanganut ikayuqtiuyut tuniyaa una tukhiutinik uvaptiknut, kihimi ikayuutikhaqqut nunaqaqtugut Kitikmeomi.[15]

Katimayiingit naunaiqtaa Sabinaup ihumaliurutingit piliurniaqtaa ilangit hapummiutilluaqhimayut tuktut hapummiutikhangit piliurhimayut Ukiuqtaqtumut. Ihuarhaffaarninnga Havauhikhaq ihumaliurutingillu aadlatqiingittuq naunairiami piqaqtuq naunaittumik hungiutittaaqtumik munariniqmut ihumaliurut iliqtuq palungaiyariami piniaruknaqhiyuq Havauhikhaq qaliriiktut ukununnga tuktut nurraliurvingit, taimaa nutaaq tuktut nurraliurvingit qaliriingittut Havauhikhamut. Katimayiingit tautuktaminik, una aadlatqiittuq akhuraaluklu hapummiutiyauyuq hungiutiyumut munariniq piniaruknaqhiuyut ukununnga havauhikhaq-pipkaidjutauyut qanuriliurutingit nungutpallialiqtut tuktut amihuaryungit naunaittuq, nayuganga Havauhikhaq nakuungmat kahaktaunginmallu pivallianiqmit. Unalu, Inuit Qaujimaningit unalu Qangaraaluknitaq Ilihimaniq naunaiqtaa tuktut atuqtait tahamna qangaraaluk tuktut nurraliurvikhanganik qakugulu utiffaarniaqtut talvunga naunaittuq 27-ukiunik piyuq Havauhikhaq (aturninnganit taimaaqtiniqmut).

Tamna 2017 ihuarhaininnga Ikayuqtiuyup ihumaliurutinganik ihuarhinnnangiluni ikikliyuumiutiniaruknaqhiyaanik havauhikhaq-pipkaidjutauyuq qanuriliurutingit tuktunut aadlanullu maniqqamilu huradjat akhatut, Sabina piumayullu akhuraaluk ihuarhaininnga ilaliutininngalu Havauhikhamut qanuriliurutingit munariniqmut pinahuarutingit. Tamaat iliuraqtaukpat, una ihuarhaqhimayuq munariniq akhuraaluk angikliyuumiqtaa Katimayiingit naunaittuq taimaa Sabina piniaqtaa naunaitkutaq ihariagiyauyuq kiugiami qilamik ihumagingitait angitqiyauyuq ihumagiyanginnik qanuriliurutingit ilitariyauyut.

Ilaliutingalu Kingulliqpaanga Tuhaqtipkaidjut, Katimayiingit tuhaayaat, piyuq nutaanguqhimayumik naunaitkutaq ihariagiyauyullu aadlangurninngit Sabinaup ihumaliuqtanginnik, piqaqtuq angiyumik ikayuutikhaq Havauhikhamut tamainnit Ilaupkaiyuq, Nunallaani Havaktut tamaillu inuit ilauyut. Ilauyut naunaiqtaa tamna Havauhikhaq naunaiqtaa akhuraaluk havaakhat maniliurutikhallu inungnut talvani, taimaa hapummiutihimatillugu avatinganit. Katimayiingit tuhaayullu ilanginnut inuknut, ihumaalutilik piniaruknaqhininngani una Havauhikhaq ihuaqtumik, uyarakhiurniqlu havauhikhat tamaat, nakuungittuq qanuriliurutingit anirhaaktaptiknik, nuna, imanga, huradjat inuillu talvani.[16]

[14] S. Anablak, Kitikmeot Inuit Katimayiit, NIRB aadlamik Kingulliqpaanga Tuhaqtipkaidjut Naunaitkutinga Nampaa 12MN036 Aadjikutaliurhimayuq, Imaruqtirvia 3, makpirvia. 1045, titiraqhimaninngani 5-15.

[15] H. Magsagak, Iqaluktuutiaq, NIRB aadlamik Kingulliqpaanga Tuhaqtipkaidjut Naunaitkutinga Nampaa 12MN036 Aadjikutaliurhimayuq, Imaruqtirvia 3, makpiraangani. 1042-1042, titiraqhimaninngani 14-18 titiraqhimaninnganilu 24-26 titiraqhimaninnganilu 1-8.

[16] Takulugu uqaqtaminik J. Angulalik, Iqaluktuutiaq, NIRB Aadjikutaliurhimayuq Kingulliqpaanga Tuhaqtipkaidjut Naunaitkutinga Nampaa 12MN036 Titiraqhimaninnga, Imaruqtirvia 2, makpiraangani. 776-785.

Talvangaanit ihuaqtumik ihumagiplugu tamaita naunaitkutat tuniyauyuq ukununnga Katimayiingit tamainnit ihivriuqninnganik una Hannigayuq Havauhikhaq, NIRB iniqtiqtaa tamna Havauhikhaq pittaaqtuq laisiliqinirmut pipkaidjutiniqmullu munariniqmut piluni. Tamna naunaitkutaq tuniyauyuq pitillugu Katimayiingit aadlamik ihumaginiq uuminnga Havauhikhaq talvangaanit Ministaup Ubluqtuhinia 2017 pitquyanganik, ihuaqtumik angikliyuumiqtuq ilihimaniq piyuq uumunnga qanuriliurutingit itqurnarutauyut ikikliyuumiutiniqlu kikliqariami ihariaginiaqtanganik nakuungittuq avatinga unalu inungnut ikayuutikhait qanuriliurutingit. Pitquyauhimayuq tamna Havauhikhaq pihimmaaqtuq, ihariagiyauyuq titiraqhimayumi Titirarhimaninga Angirutiup 12, Ilangani 12.5.6(c) uumannga *Nunavut Angirutinga*, Katimayiingit pitquyauhimayut ilangit 90 atuqtauvaktunut qanurittaakhainganinginnullu munariyakhait Havauhikhaq hivumuuqtuq, ilaliutiyuq akhuurutauyumik ikikliyuumiutitut, atan'nguyauniqmut, munariniqmullu ihuaqtut avatinga unalu inungnut ikayuutikhait qanuriliurutingit. Katimayiingit pitquyauyut piyut naunairiami tamna Hannigayuq Havauhikhaq piliuqtauyuq, aulapkaiyauyuq piffaaqtaillu ihuittumik nakuungittumiklu pilaqutigiyaa avatinga itquumaninnga Nunavut Nunagiyangani.

Katimayiingit iniqtirvingit pitquyautingillu naunaipkaqtauyut tamaita naunaitkutat tuniyauyuq tamainnut ilauyunit, uqaqtaminiklu, apirhuutingillu qanuqtutlu ihumagiyamiknik tuniyauyuq tamarmikni Kingulliqpaanga Tuhaqtipkaidjut, angiyuq titiqqat iliuraqtait naunaiyaqtillugit ihivriuqtillugitlu una Havauhikhaq, titiqqat iliuraqtait Ministamut kiudjutiyuq uumunnga Katimayiingit 2016 Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq unalu Inuit Qaujimaningit, Qangaraaluknitaq Ilihimaniq naunaitkutangalu ittuq uumani *Iniqhimaittuq* unalu Kingulliqpaaq Avatiliriniqmut Pilaqtutinga Naunaitkutat unalu FEIS Ilaliutihimayuq iliuraqtait Sabina-mit. Katimayiingit iniqtirvingit pitquyautingillu naunaiqhimayuq uumani ihuarhaqhimayumi Kingulliqpaanga Tuhaqtipkaidjut Taiguagakhaq piliurhimaninnga Katimayiingit tamaat ihivriurut tamainnik naunaitkutaq tuniyauyuq. Katimayiingit quviagiyait tamaita aadlanut piyut ilihimayanginnik, qanuqtut ihumagiyanginnik ayuittamikniklu uqariami Havauhikhamut tamainni Katimayiingit ihivriuqniq Havauhikhamut.

Katimayiingit naunaiqtitaa mihigimaninnga akhuraaluk havaangit Sabinaup, Katimayiingit tamaitalu ikayuutauyut ihivriuqniqmut Havauhikhanganik taimaa 2012mit, pipkaidjutiyuq ihuarhaqhimalluaqtumik, akhuraaluk hapummiyuq hivuliqtiuyuqlu uyarakhiurniqmut havauhikhaq. Sabina malikkumiuk uqariiyaqtaminik unalu Katimayiingit pitquyauhimayut atuqtauvaktunut qanurittaakhainganinginnullu, Katimayiingit ilihimayuq Havauhikhaq pipkaidjutiniaqtuq uuktuutinga nungulaittumik pivallianiq hapummiutiyuq avatinganik ihuarninnga nunap, ilaliutiyuq Inuit Qaujimaningit unalu Qangaraaluknitaq Ilihimaniq uumunnga Havauhikhaq pihimmaaqluni, tuniyuqlu akhuurutauyuq pihimmaaqtumiklu inungnut ikayuutikhait Nunavunmiutanut, nuatqativullu Nunatsiaqmi.

ᐊᐅᓪᓛᔨᒃᑯᓐᓂ ᓇᐃᔭᓕᕆᐊᖅᑭᒧᓪᓗᖅ

ᒎᓐᓇ ᐋᖅᑭᑎᐊᖅᑭᒧᓪᓗᖅ ᑭᖓᔪᓕᖅᐸᒋᑦ ᐃᓕᓐᓂᐅᕙᔪᒍ ᐅᓂᒃᑲᓕᐊᖓᑭᒧᓪᓗᖅ ᐊᑐᓕᔪᐊᓘᔨᓕᔪᓪᓕᓗ ᑐᖏᖓᑐᓄ ᑎᑎᕐᓂᐊᕐᓂᖅ ᐄᓕᐊᓐᓂᖓᓪᓗᒥ ᔫᑐᓂᐊᕐᓂᖓᓪᓗᒍ ᐱᓕᕆᔨᒃᑲᓪᓚᕆᐊᖃᖅ, ᓄᓇᑭᓪᓗ ᐋᖅᑭᑎᓕᓴᐅᔪᑦ ᑲᑎᒪᔨᖓᑎᑦ ᑎᑎᖅᑲᓄᑦ ᐃᓗᐊᑦ: 12MN036 (ᐄᐋᓐᓂᖓᓪᓗᒥ ᐱᓕᕆᓘᑲᖅᑲᖅ ᐅᖅᖢᔨᐅᓐᓂᑦ ᐱᓕᕆᓘᑲᖅᑲᖅ), ᑐᓐᓂᓴᐅᔪᒧᓪᓗᖅ ᑕᐅᔪᓄᖓᓂ ᓴᐃᓇ ᔫᑐᓂᐊᕐᓂᖓᓪᓗᒥ ᐋᖅᑭᑎᓕᓴᐅᔪᑦ ᐊᐅᓚᓴᓴᑲᔪᓐᓂᖓᓪᓗᒥ (ᓴᐃᓇ ᐅᖅᖢᔨᐅᓐᓂᑦ ᑐᓴᕐᓂᑲᓕᔪᓪᓕᑦ) ᑕᐅᔪᓄᖓᓂ ᓄᓇᑭᓪᓗᖅ ᐃᒪᓕᕆᓂᖅ ᐋᖅᑭᑎᓕᓴᐅᔪᑦ ᑲᑎᒪᔨᖓᑎᑦ ᑎᑎᖅᑲᓄᑦ (NIRB ᐅᖅᖢᔨᐅᓐᓂᑦ ᑎᑎᖅᑲᓂᑦ) ᐋᓂ 2012ᒥ. ᐱᓕᕆᓘᑲᖅᐅᑦ ᐃᓚᐅᑐᓂᑦ ᖃᐅᔨᖃᓂᕐᓕᐅᕙᓂᖅᑐᓂ ᐱᓴᓂᖃᓂᑎᒃᓕᓐᓂᐅᓐᓂ ᑕᓴᓂᐊᓂᖅ ᑭᖓᔪᓂᐊᕐᓂᖓᓪᓗᒥ ᐃᓕᕆᔨᒃᑲᖅᑐᓂ ᐋᖅᑭᑎᓕᓴᐅᔪᑦ ᐃᓕᕆᔨᒃᑲᖅᑐᓂ ᐊᐅᓚᓴᓴᑲᔪᓐᓂᖓᓪᓗᒥ ᐃᓕᕆᔨᒃᑲᖅᑐᓂ ᐊᐅᓚᓴᓴᑲᔪᓐᓂᖓᓪᓗᒥ ᐃᓕᕆᔨᒃᑲᖅᑐᓂ (NIRB ᐅᖅᖢᔨᐅᓐᓂᑦ ᑎᑎᖅᑲᓂᑦ) ᔪᓐᓂ 2012ᒥ. ᐱᓕᕆᓘᑲᖅᐅᑦ ᐃᓚᐅᑐᓂᑦ ᖃᐅᔨᖃᓂᕐᓕᐅᕙᓂᖅᑐᓂ ᐱᔪᓐᓇᖅᑐᑎᓪᓗᓂᓚᐅᑦ ᑕᓕᕆᔨᒃᑲᖅᑐᓂᑦ ᐊᑲᓂᕐᓂᖓᓪᓗᒥ ᐃᓕᕆᔨᒃᑲᖅᑐᓂ ᐊᐅᓚᓴᓴᑲᔪ

ᑐᒃᓯᕋᕐᑕᐅᓯᒪᔪᖅ ᐱᓕᕆᐊᒃᓴᒧᑦ ᐱᖓᓕᒃᑕᐊᓂᖅᑎᕐᓴᖅᑐᑦᓂᖅ ᑐᒃᑐᐃᑦ ᐃᓂᒋᓕᒃᑕᖓᓂᖅ, ᐃᓕᒋᓪᓗᓂᔨᒃ ᖃᐅᔨᐅᔪᓂᓪᓗ ᓴᓗᐊᐃᓗ ᒥᒃᓂᒥᐅᑕᐃᑦ ᑐᒃᑐᖏᑦ ᐃᓗᐊᖅ, ᐱᓚᒪᓕᐅᑎᓴᐅᔪᑦ ᐃᓕᓴᕐᕕᖓᓂᖅᑎᑦ ᐊᒥᓱᓄᑦ ᓄᓇᕗᒻᒥᐅᓄᑦ ᓄᓇᕗᐊᖅᑎᑦ ᑲᑎᒪᔨᐅᑎᒃᓯᒪᓂᖅ ᐊᐅᓚᑦᑎᓂᖅ ᓄᓇᕗᒻ ᓄᓇᕗᐊᖅᑎᑦᓪᓗ ᓴᖅᓯᒪᔪᖅᑐᑦ, ᐱᓕᕆᓂᖅ ᖃᐅᔨᓴᓂᖅᓯᒪᔪᖅ ᐃᓕᓴᕐᕕᖓᓂᖅᑎᑦ ᓄᓇᕗᒻ ᓴᖅᓯᒪᔪᖅᑐᑦ ᐊᐅᓚᑦᑎᓂᖅ ᓄᓇᕗᒻ ᓴᖅᓯᒪᔪᖅᑐᑦ ᐃᓕᓴᕐᕕᖓᓂᖅᑎᑦ ᐱᓕᕆᓂᖅ

> *Ⅾ, ᐃᓕᓐᓂᓐᓂᒃ ᑐᓴᐅᒪᖅᑎᓂᕐᑐᑦᑐᒍᑦ; Ⅾ, ᐃᓕᓐᓂᒃᓯᑦ ᐅᑉᐳᓴᖅᑕᐅᑎᐊᓐᓇᒃ. ᐃᓚᖅᑎᖅᑎᓂᐅᕐᕕᑦ ᑕᐃᒪᐃᑐᑐᐃᓐᓇᐅᕕᒋᔭᒪᒡᒪᑕ, ᐊᑲᐅᓐᓂᑕᐅᑐᑕᖅᑕᖅᑲᑦᑐᑐᑐᒍᑦ ᑐᑴᓴᖅᑕᐅᑐᑕᖅᑐᑦᑐᒍᑦ ᑐᓴᖅᑎᑦ. ᐅᓴᐊᓂ ᒪᑉᐃᓐᓇᑕᖅᑎᑦᑕᒡ ᐅᐸᑉᐳᓴᖅᑕᐅᑎᐊᓐᓇᒃᑐᑦᑐᒍᑦ ᐅᐸᑉᐳᓴᖅᑕᐅᑎᐊᓐᓇᒃᑐᑦᑐᒍᑦ ᐃᑲᐅᑎᓂ

ᐃᓕᒋᐊᕈᑎ) ᑐᓂᔨᐅᓕᐅᖅᑐᖅ ᓴᐲᓇᖅᑯᓂ. ᑲᑎᒪᔨᑦ ᑭᖓᔪᓕᖅᐸᖅᓯᐅᑎᖓᑦ ᐊᑐᕐᓯᐅᔭᖓᓕᒫᑦ ᐅᓗᓀᐃᖅᑕᐅᓯᒪᔪᑦ ᑕᕝᕕᓂ ᐋᖅᑭᒋᐊᖅᑕᐅᓯᒪᔪᒥ ᑭᖓᔪᓕᖅᐸᒋᑦ ᓄᓕᖅᑐᐅᔪᒪᒃ ᐅᓂᒃᑲᓕᐊᒥᒃ ᓴᖅᑭᕈᐅᓯᒪᓕᖅᖢᖅ ᑲᑎᒪᔨᑦ ᓯᐅᕐᓯᒪᔭᖓ ᐅᖅᑕᐅᓯᖅᑐᓂᒃ ᐊᑐᖅᓯᒪᔪᒥᓂᒃ, ᐃᓯᒪᑎᕆᒥᓂᒃ ᖃᐅᔨᓴᓕᕆᓂᖅᓯᒪᔪᑦ ᐱᓕᕆᐊᖃᑦᑕ ᐅᖅᑕᐅᓯᖅᑐᓂᒃᑯᑦᓯᒪᔪᑦ ᐱᓕᕆᐊᖃᑦᑕ.

ᑲᑎᒪᔨᑦ ᐅᖅᑲᒃᑲᓂᕐᓂᑦ ᓴᐲᓇᖅᑯᓂ ᐱᓕᕆᔨᐊᖅᓂᕆᓕᒪᓕᕐᓂᖅᑕᖏᑦ, ᑲᑎᒪᔨᓕᒃ ᐃᓕᓴᕐᓂᕐᒪᑦ ᖃᐅᔨᓴᓕᕆᓂᖅᓯᒪᔪᑦ ᐱᓕᕆᐊᖃᑦᑕ ᑕᐃᒪᓐᓇᓂᒃ 2012ᒥᓂ, ᓴᖅᑭᒃᓯᒪᔪᖅ ᐱᐅᓂᖅᑲᓴᒪᓕᐊᔭᖓᑦ, ᓴᐃᓐᔨᓴᒪᓕᐊᔭᖓᑦ ᐊᓴᒪ ᓯᕗᓕᖅᑎᐅᓕᓕᒃᑎ ᐅᓴᕐᓂᕐᐊᖅᓂᕐᓂᑦ ᐱᓕᕆᐊᖅᑐ. ᓴᐲᓇᖅᑯᓂ ᒪᓕᕐᑎᐊᖅᐸᑕ ᐊᖏᕐᓂᓯᒪᔨᖏᕐᓂᖅᑐᒃ ᑲᑎᒪᔨᓕᒃ ᐊᑐᕐᓯᒪᔪᒥᓂᒃᑲᓕᐊᔭᖓᓕᒫᑦ ᒪᓕᕐᑕᐅᔾᓴᕆᓕᐊᓕᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᑕᐅᐅᔾᔨᓕᓕᖅᑕᖏᓐᓂᓕᒃ, ᑲᑎᒪᔨᑦ ᐅᐸᐱᓯᖏᒪᓕᖅᑐᑦ ᐱᓕᕆᐊᖏᐅᐊᖅᑐᖅ ᑭᓱᓕᖅᑐᐃᓂᐊᖅᑐᖅ ᒪᓕᑐᕆᔨᑎᐊᖅᓵᖓᓐᓇ ᐱᖅᓯᓕᐊᑎᓯᓴᓐᓂᕐᒧᑦ ᓴᐳᔾᔨᖅᑐᐃᑦ ᐅᓪᓗᕆᑲᑕᖅᑕᖏᓐᓂᖅᑐᒃ ᐱᓕᕆᐅᑎᑦᑕᐅᓂᒃ ᑭᑎᖅᑎᐅᑦ, ᐃᓕᓴᐅᔨᓴᓯᒪᔪᖅ ᐃᓄᐃᑦ ᖃᐅᔨᓴᓕᔪᑐᖅᑐᒃ ᐱᖅᑯᓯᐅᑎᔪᓂᒃ ᖃᐅᔨᓴᕐᓂᑦ ᑕᐃᒪᐃᓐᓇᖅᑐᖅᓯᐅᓕᖅᑐᓂᒃ, ᐊᓯᒪ ᑲᔪᓯᑎᑦᓯᓂᓂᒃ ᐱᓯᒪᓕᐅᔪᓂᒃ ᐊᑕᑯᑦᓂᖅᓯᐅᓕᖅᑐᓂᒃ ᐃᓕᓴᕐᓂᑦ ᑕᐃᒪᐃᓐᓇᖅᑐᖅᓯᐅᓕᖅᑐᓂᒃ ᐃᑲᔪᑎᑦᓴᓂᒃ ᓄᓇᕗᑦ.

RÉSUMÉ

Ce rapport révisé de l'audience finale et ces recommandations visent le projet de mine d'or à la rivière Back, no. de dossier 12MN036 de la CNER, (le projet ou le projet de la rivière Back), présenté par la Sabina Gold & Silver Corp. (Sabina ou le promoteur) à l'Office des eaux du Nunavut et à la Commission du Nunavut chargée de l'examen des répercussions (CNER ou la Commission) en juin 2012. La portée de ce projet examinée par la Commission et objet de cette audience finale complémentaire, englobe l'exploitation de deux (2) zones principales : une mine d'or (quatre – (4) gîtes minéraux exploitables à partir d'une mine à ciel ouvert ainsi que par des méthodes souterraines) , une usine de concentration avec infrastructures associées à la Goose Property[23] et une aire de dépôt maritime à Bathurst Inlet. Il est proposé que les deux (2) zones soient reliées sur une base saisonnière (de janvier à avril) par une route d'hiver en glace d'environ 160 km.

Tel qu'énoncé à l'article 12 de *l'Accord entre les Inuit de la région du Nunavut et Sa Majesté la Reine en Chef du Canada (*l'*Accord sur le Nunavut)*, la Commission a entrepris depuis 2012 l'examen des éventuelles répercussions environnementales et socioéconomiques du projet proposé en vue de déterminer si le projet devrait ou non être autorisé à aller de l'avant et si, le cas échéant, selon quelles modalités et conditions. L'examen de ce projet de la rivière back a été instruit par les objectifs et le mandat de la CNER, prescrits à l'article 12, paragraphe 12.5.5 de *l'Accord pour le Nunavut*.

Entre 2012 et 2016, la Commission a effectué un examen approfondi du projet, impliquant l'étude d'un Énoncé *provisoire* et d'un Énoncé définitif des incidences environnementales (EPIE et EDIE), soumis par la Sabina, de nombreuses périodes de commentaires écrits, des rencontres communautaires, des réunions techniques, une conférence préparatoire à l'audience et une audience finale tenue à Cambridge Bay en avril 2016. Tel qu'indiqué dans le rapport 2016 de l'audience finale[24], La Commission s'est retrouvée à la fin de ce processus avec de nombreuses préoccupations, de l'incertitude et de la défience vis-à-vis des mesures d'atténuation proposées pour des effets précis ; ce qui l'a amené à conclure que le projet ne devrait pas être autorisé à aller de l'avant. La Commission était particulièrement préoccupée par la possibilité de graves et néfastes répercussions écosystémiques sur les caribous, les autres espèces de la faune terrestre, les poissons et les environnements d'eau douce et marin; elle redoutait en outre la possibilité de néfastes effets socioéconomiques liés aux incidences écosystémiques qui ne pourraient être adéquatement et sérieusement gérés et atténués.

En janvier 2017, la ministre des Affaires autochtones et du Nord a, - (au nom des autres ministres compétents ayant responsabilité réglementaire pour le projet)-, et en vertu de l'article 12, paragraphe 12.57 (e) de *l'Accord sur le Nunavut*, renvoyé le rapport 2016 de l'audience finale à la Commission. Dans son renvoi, la ministre a demandé à la Commission de revoir l'évaluation de cinq(5) secteurs clés du rapport qu'elle jugeait faible et déficiente et de lui en faire part. Sur réception du renvoi de la ministre, la Commission a demandé des renseignements supplémentaires à la Sabina et aux intervenants afin de régler les zones d'incertitude qu'elle avait dénoncée dans son rapport 2016 de l'audience finale. Et plus particulièrement de régler l'éventuelle possibilité d'importantes et néfastes répercussions sur les caribous, les autres espèces de la faune terrestre, les environnements d'eau douce et marin, la qualité de l'eau (souterraine et de surface), le climat et la météorologie.

[23] À environ 400 kilomètres (km) au sud-ouest de Cambridge Bay, Nunavut, 95 km au sud-est de l'extrémité sud de Bathurst Inlet et à 520 km au nord-est de Yellowknife, Territoires du Nord-Ouest.

[24] Rapport de l'audience finale, no. de dossier 12 MN036 de la CNER, pour le projet de mine d'or à la rivière Back, de la Sabina Gold, 15 juin 2016 (Rapport 2016 de l'audience finale).

La Sabina a répondu en soumettant en février un addenda à son Énoncé définitif des incidences environnementales (addenda à l'EDIE). Les intervenants ont déposé d'autres mémoires écrits sur ledit addenda et sur les domaines d'incertitude. Une réunion technique a été tenue par téléconférence avec les parties en lice et une audience finale complémentaire principalement axée sur les domaines d'incertitude et sur les données actualisées de l'addenda de l'EDIE a été organisée pendant quatre (4) jours, soit du 31 mai au 3 juin à Cambridge Bay.

Étant donné que la zone de développement du projet sera située sur un territoire chevauchant les aires de distribution de diverses hardes de caribous, y compris la harde de Bathurst si importante pour les exploitants traditionnels de plusieurs collectivités des Territoires du Nord-Ouest, et conjointement gérée par les gouvernements du Nunavut et des Territoires du Nord-Ouest, l'examen de la Commission a mobilisé et attiré des personnes de l'extérieur du Nunavut qui ont activement participé au processus. Plus particulièrement, la Commission a sollicité la participation du gouvernement des Territoires du Nord-Ouest et du gouvernement Tlicho, de la Première Nation Yellowknives Dene, de la Première Nation de Łutsel K'e Dene, de l'Alliance métis North Slave, et des représentants de Behchokǫ̀, Whatì, Wekweètì, Gametì, N'dilo et Dettah. Outre la participation de représentants transfrontaliers, la Commission a multiplié les possibilités pour permettre aux représentants des gouvernements locaux, territoriaux et fédéral, de l'Association inuite de Kitikmeot, des organisations locales de trappeurs et chasseurs, aux représentants de chacune des sept (7) collectivités de Kitikmeot, des Aînés, étudiants et des membres de la population, d'exprimer leur point de vue sur le projet et sur ses éventuels effets sur les collectivités et sur l'environnement.

Ce rapport révisé est basé sur le rapport de l'audience finale 2016 ; il l'actualise et le remplace. Il révèle les importants ajouts à l'examen des répercussions ainsi que les grandes et capitales révisions apportées par le promoteur aux mesures d'atténuation, de gestion et de surveillance prévues pour des effets précis survenus au cours des 13 mois suivant la publication du rapport de 2016. Pour ceux qui craignaient que l'examen plus poussé du projet ne soit qu'un « aval automatique » dénué de toute amélioration substantielle, la Commission tient à préciser que cet examen ultérieur a été conduit avec le même soin et la même rigueur que l'évaluation initiale.

Comme l'ont reconnu les intervenants et représentants communautaires qui ont participé à l'audience finale de 2016 et à l'audience finale complémentaire, l'addenda de la Sabina à l'EDIE et les révisions effectuées au plan du promoteur sont considérables et résultent d'une intense consultation avec les intervenants et les collectivités. Jayko Palongyak, un représentant communautaire de Kugluktuk a même déclaré:

> *«Je crois que vous (gens de la Sabina), vous vous êtes surpassés par rapport à vos premières propositions de l'audience finale. C'est une bonne chose à savoir. Votre nouveau programme est nettement plus approfondi. Je pense que vous êtes allés bien plus loin que ce que l'on vous réclamait. Nous appuyons la Sabina – et nous la soutiendrons encore. Nous savons que vos mesures d'atténuation sont nettement supérieures à celles que l'on vous demandait ».*[25]

La Commission a également entendu un message analogue d'intervenants ayant participé aux deux audiences finales:

[25] J. Palongyak, procès-verbal de l'audience finale complémentaire de la CNER, no. de dossier 12MN036, 3 juin, page 1022, lignes 16 à 23

« …quand le procès-verbal de cette procédure sera examiné, ….il montrera que la Sabina a apporté d'importants changements au projet de la rivière Back. Non seulement pour optimiser la protection de l'environnement mais encore pour atténuer d'éventuelles répercussions sur l'environnement. Grâce aux procédures de la CNER et au travail acharné de toutes les personnes impliquées, la KIA a conclu que ce bon projet a été bonifié. La KIA est satisfaite des programmes d'atténuation et de surveillance proposés par la Sabina pour le projet de la rivière Back, y compris de leurs plans de protection et de surveillance. » [26]

La Commission félicite la Sabina et tous les participants de la collaboration dont ils ont entouré cet examen complémentaire du projet et encourage toutes les parties à continuer à l'exercer par la suite. Comme le décrit Harry Maksagak:

Nous travaillons pour une cause commune. Nous continuons à respecter les gens, les relations, l'environnement, la terre et les animaux. Nous accueillons une industrie bénéfique pour le Nunavut

Certes, il y a des malentendus ; oui, nous avons des réserves. N'importe quelle relation peut un jour se fissurer par manque de communication claire et ouverte. Mais à présent que nous avons ouvert la porte aux communications bilatérales autour de cette table et que nous avons instauré une compréhension commune de la manière dont nous allons fonctionner, je suis sûr que nous allons prévoir d' aller de l'avant non seulement dans l'intérêt du promoteur qui nous a apporté cette proposition mais aussi dans l'intérêt de tous ceux d'entre nous qui vivent dans la région de Kitikmeot. [27]

La Commission souligne que les mesures de protection prévues dans les plans de la Sabina s'inscriront parmi les mesures les plus protectrices jamais instaurées dans l'Arctique. Les révisions apportées au projet et aux plans de la Sabina ont également un caractère unique car elles garantissent la mise en vigueur de clairs plans de gestion adaptative pour contrer la possibilité de tout chevauchement du projet sur les aires de mise bas des caribous et ce, même si les aires actuelles de mise bas des caribous ne chevauchent pas la zone du projet. La Commission estime que cette approche unique et fortement protectrice engendrée par la gestion adaptative des éventuelles répercussions du projet sur des populations déclinantes de caribous s'impose, car la région entourant la zone du projet est vierge et relativement intacte. De plus, selon le Qaujimaningit inuit et le savoir traditionnel, les caribous ont dans le passé, utilisé ces terres pour leur mise bas et pourraient y revenir au cours des 27 années d'exploitation prévue du projet (de la mobilisation au déclassement).

Outre les révisions 2017 apportées à ses plans pour optimiser l'atténuation des répercussions éventuelles du projet sur les caribous et autres espèces de la faune terrestre comme les grizzlis, la Sabina a également proposé d'importants ajouts et améliorations à ses programmes de surveillance des effets éventuellement provoqués. Si cette surveillance est intégralement mise en vigueur, la Commission sera convaincue que la Sabina aura les informations nécessaires pour réagir et intervenir rapidement en cas de répercussions imprévues ou de répercussions plus importantes qu'envisagées

[26] Anablak, Association inuite de Kitikmeot, procès-verbal de l'audience finale complémentaire de la CNER, no. de dossier 12MN036, 3 juin, page 1045, lignes 5 à 15.

[27] H. Magsagak, Cambridge Bay, procès-verbal de l'audience finale complémentaire de la CNER, no. de dossier 12MN036, 3 juin, pages 1042à 1043, lignes 24 à 26 et 1 à 8.

Lors de l'audience finale complémentaire, la Commission a vu tous les intervenants, les représentants communautaires et la majorité des membres participants de la population accorder un vaste soutien au projet, en se basant sur les mises à jour des données et les changements substantiels apportés aux plans de la Sabina. Les participants ont reconnu que le projet offrait d'importantes possibilités d'emploi et d'avantages économiques à certaines résidents de la région, tout en protégeant l'environnement extérieur. La Commission a d'autre part entendu les préoccupations de certains Inuits quant aux possibilités du projet en particulier et des projets miniers en général, de provoquer de néfastes répercussions sur l'air, la terre, l'eau, la faune et les habitants de la région. [28]

Après avoir examiné toutes les informations fournies pendant son examen du projet de la rivière Back, la CNER a conclu que le projet pouvait désormais se rendre à l'étape de délivrance des permis et d'autorisations réglementaires. Les renseignements fournis pendant l'examen supplémentaire du projet prescrit par la ministre dans son renvoi de janvier 2017, ont suffisamment renforcé la confiance de la Commission envers les mesures de prévision des incidences et les mesures d'atténuation applicables pour limiter d'importants et néfastes effets écosystémiques et socioéconomiques. En recommandant que le projet soit autorisé à aller de l'avant, conformément à l'article 12, paragraphe 12.5.6 (c) de *l'Accord sur le Nunavut*, la Commission a également recommandé plus de quatre-vingt-dix (90) modalités et conditions qui devront régir la réalisation du projet, notamment dans des secteurs-clés comme l'atténuation, la gestion et la surveillance des effets écosystémiques et socioéconomiques particuliers. Par ses recommandations, la Commission veut s'assurer que le projet de la rivière Back soit développé, exploité et que son site soit récupéré sans répercussion excessive et néfaste sur l'intégrité écosystémique de la région du Nunavut.

Les conclusions et recommandations de la Commission ont été instruites par tous les renseignements fournis par les participants, incluant leurs exposés, leurs questions et leurs commentaires pendant les deux audiences finales, ainsi que par l'abondante documentation soumise pendant l'examen et la révision du projet, par la correspondance avec la ministre en réponse au rapport 2016 de l'audience finale, aux principes du Qaujimaningit inuit et au savoir traditionnel, par toutes les données inclues dans les Énoncés *provisoire* et définitif des incidences gouvernementales et dans l'addenda à l'EDIE, déposé par la Sabina. Les conclusions et recommandations formulées dans ce rapport révisé de l'audience finale sont le fruit de l'examen rigoureux entrepris par la Commission de tous les renseignements présentés. La Commission tient à exprimer sa reconnaissance à tous ceux et celles qui ont partagé leurs expériences, leurs opinions et leur expertise tout au long de l'examen de la CNER.

La Commission estime concurremment que le travail acharné réalisé depuis 2012 par la Sabina, de la Commission et de tous les contributeurs tout au long de l'examen de ce rapport a donné naissance à un projet minier avant-gardiste, grandement amélioré et fortement protecteur. Si la Sabina respecte ses engagements et les modalités et conditions qui lui ont été recommandées, la CNER est nettement convaincue que le projet deviendra un modèle de développement durable, protégeant l'intégrité économique de la région, intégrant le savoir traditionnel et les principes du Qaujimaningit inuit sur une base continue et engendrant des avantages socioéconomiques durables pour les Nunavummuit et pour nos voisins des Territoires du Nord-Ouest.

[28] Se référer aux remarques de J. Angulalik, procès-verbal de l'audience finale complémentaire de la CNER, no. de dossier 12MN036, 3 juin, pages 776 à 785.

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

The Back River Gold Mine Project (NIRB File No. 12MN036; the Back River Project or the Project) consists of the proposed mobilization, construction, operation, closure, reclamation, and post-closure monitoring of a gold mine operation in the Kitikmeot region of Nunavut. The Project would be located approximately 400 kilometres (km) southwest of the community of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories. The proponent for the Back River Project is Sabina Gold & Silver Corp. (the Proponent or Sabina).

The Back River Project includes two (2) main development areas with a winter ice road interconnecting the Goose Property with the Marine Laydown Area (MLA), which would be located at Bathurst Inlet. The Goose Property encompasses four (4) mineral deposits: Umwelt, Llama, Echo, and Goose Main, which would all be accessed using conventional open pit and underground methods. The Goose Property would comprise of a processing plant, four (4) deposits to be mined through open and underground mining methods, an all-weather air strip, a camp facility, and associated mining facilities. The MLA would be located approximately 130 km north-northwest of the Goose Property and would be the primary staging area for equipment, material, fuel, and other supplies required for the construction and operation of the Project. The MLA would consist of a single grounded terminal barge, laydown areas, a camp facility, and associated storage and maintenance facilities. The George Property, an advanced exploration camp located approximately 50 km northwest of Goose Property, currently has four (4) mineral deposits identified for potential future development. Sabina would also construct an annual spur road from the winter ice road to the George Property for transportation of supplies to the site. The continuation of a diamond drilling based mineral exploration program for the George Property and the Wishbone claim of mineral leases was included within the scope of the Board's assessment, while further advanced exploration (i.e. bulk sampling and infrastructure development) was explicitly not included with the understanding such activities would require further assessment by the NIRB prior to occurring.[29]

Total minable mineral reserves for the Project are estimated at approximately 19,792 thousand tonnes at 5.70 grams per tonne for a quality of contained gold of 3,628 thousand ounces. Ore mined at the Goose Property would be hauled to ore stockpiles located at the Goose Site where the ore would be processed within an ore processing plant (mill) using conventional gravity concentration and cyanidation techniques at a nominal capacity of 6,000 tonnes of ore per day.

A tailings storage facility would be built south-southeast of the Goose Main open pit for tailings deposition during the first two (2) years of production, with tailings then to be directly deposited into the mined-out Umwelt open pit for approximately four (4) subsequent years, and then into the mined out Goose Main open pit for the remaining four (4) years of the mine life. Sabina proposed to passively and actively fill the remaining mined-out pits with lake water to mitigate the potential generation of acid and the leaching of metals. The gold doré bars produced at the processing plant would be stored on-site and then transported off-site by aircraft on a semi-weekly basis.

[29] Pursuant to correspondence submitted by Sabina on July 3, 2015, the Proponent removed the George site from the mine development proposal, instead noting it as a site of continued exploration within the FEIS for the Back River Project. For more information, see Section 1.7: Scope of the NIRB's Assessment and Environmental Impact Statement Guidelines.

The Project would be resupplied annually using a lightering terminal and barge and fuel storage facility at the MLA, with supplies to be transported annually from southern Canada by barge during the open water season. Project materials would be transported annually from the MLA to the Goose Property using a winter ice road from mid-January to April. Figure 1 shows the overall Project site locations for the Goose Property and a MLA. Figure 2 shows the project components at Goose Lake Property and Figure 3 shows the project components at the MLA.

Figure 1: Overall Project Site Locations (source: FEIS Figure 2)

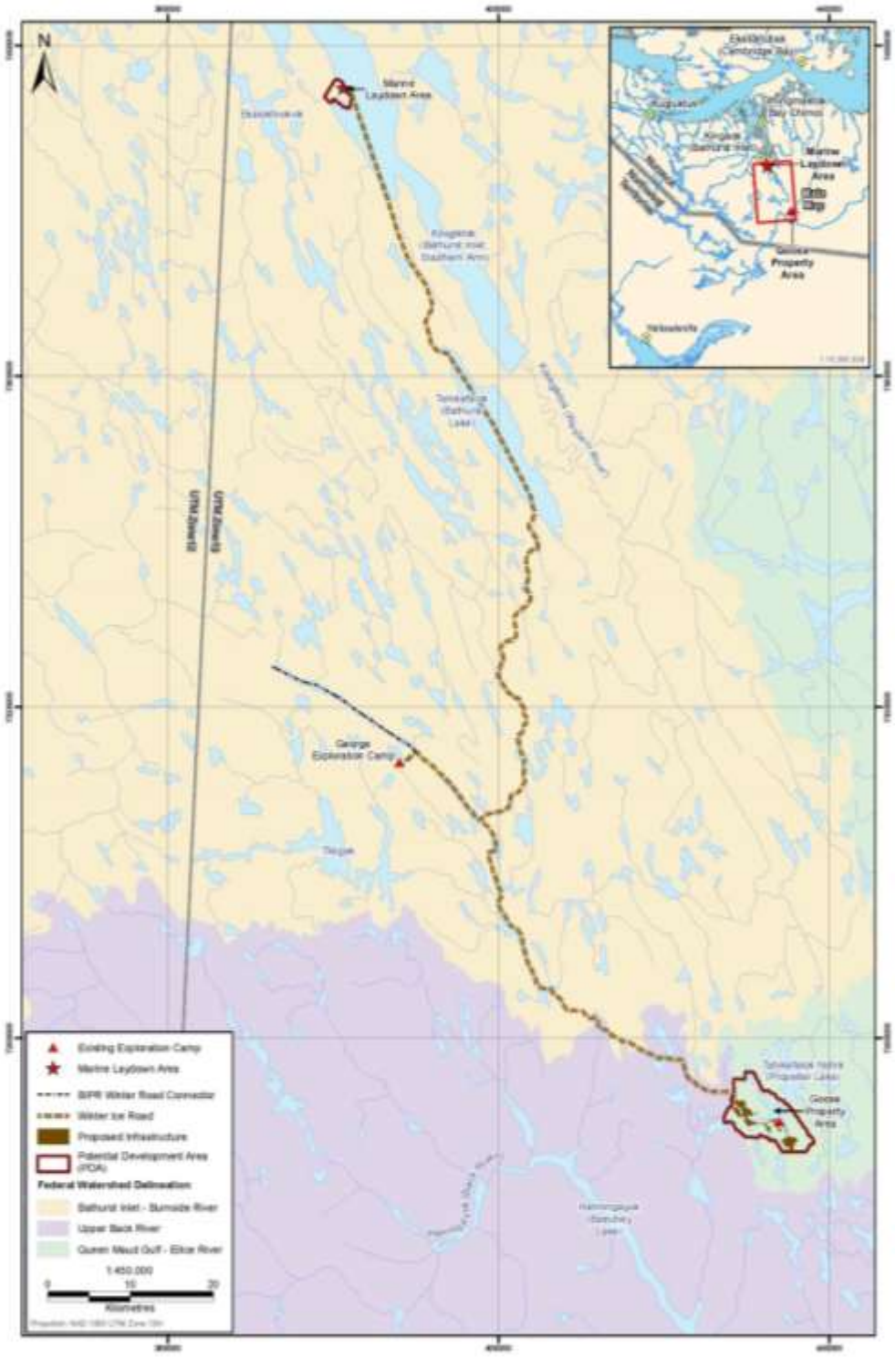


Figure 2: Location of Project Components at Goose Lake Property (source: FEIS Figure 3)

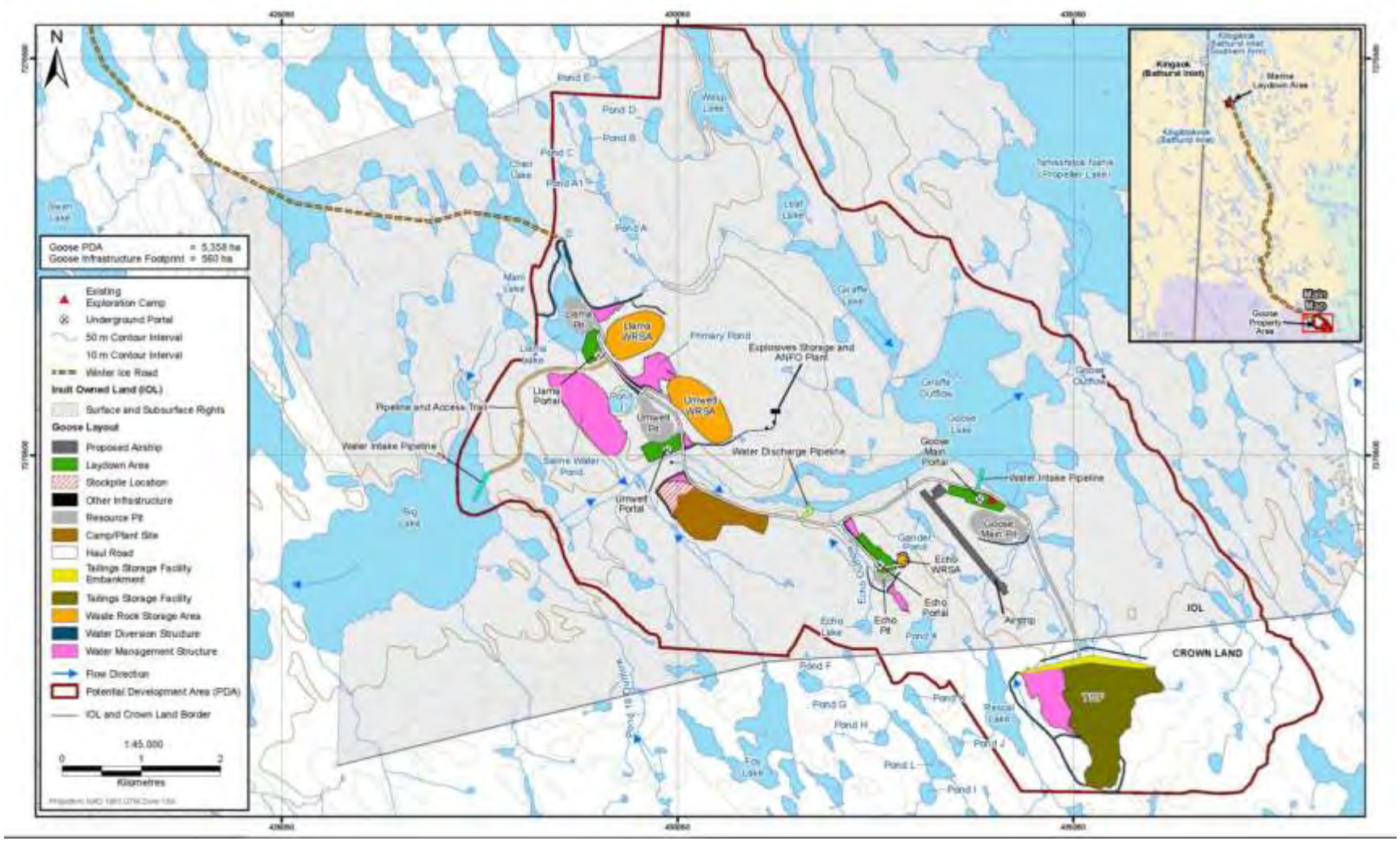
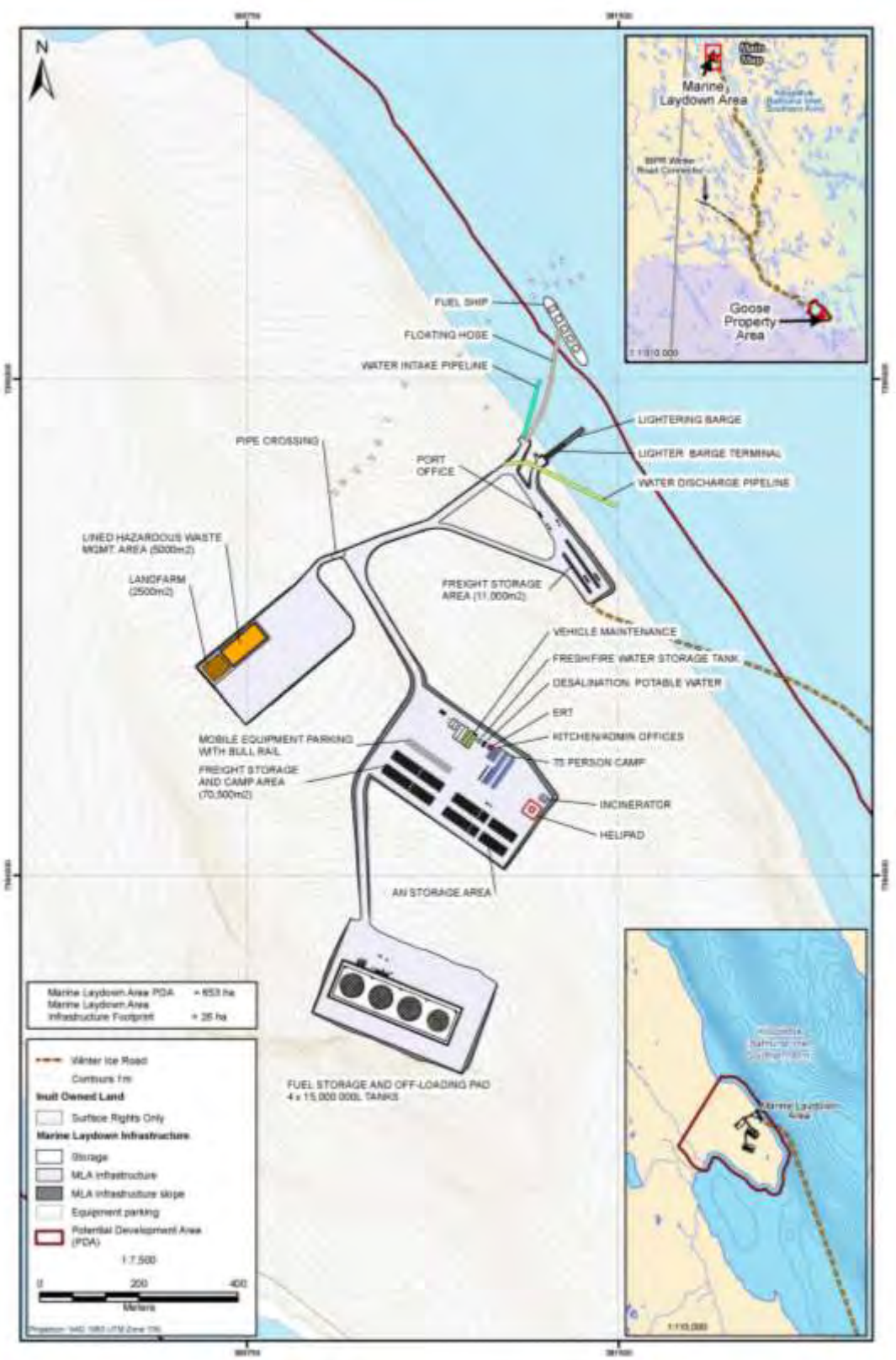


Figure 3: Location of Project Components at Marine Laydown Area (source: FEIS Figure 4)



1.2 PROCEDURAL HISTORY

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

Table 1 provides a summary of the key procedural steps associated with the Nunavut Impact Review Board's (NIRB or Board) Screening, Review, and supplemental Review assessments for the Back River Project under the *Nunavut Agreement*, commencing with the receipt of the original project proposal from Sabina on June 14, 2012 and continuing through to the completion of the Board's supplemental Final Hearing in Cambridge Bay on June 3, 2017.

Table 1 also identifies key milestones, opportunities for public participation, involvement of parties and Intervenors throughout the NIRB's Screening and Review processes, and associated timelines. Please refer to Appendix A for a record of proceedings for the 2016 Final Hearing and the supplemental Final Hearing, Appendix B for a list of exhibits presented at the 2016 Final Hearing and the supplemental Final Hearing, and Appendix C for a list of Acronyms.

As this summary is not exhaustive, parties wishing to develop a more complete understanding of the activities associated with the Board's assessment for this project proposal are encouraged to consult the complete listing of all associated documentation available from the NIRB's public registry for the Back River Project (NIRB File No. 12MN036). All documents received and pertaining to this project proposal can be obtained from the NIRB's online public registry at www.nirb.ca by using any of the following search criteria:

- Project Name: Back River Project
- NIRB File No.: 12MN036
- Application No.: 124149

Table 1: Procedural History

Screening Step	Party	Timeline	Process Steps	Notes
	Sabina Gold & Silver Corp. (Sabina or Proponent)	**June 14 & June 26, 2012**	The Nunavut Impact Review Board (NIRB) received the Back River Project Proposal (the Project) from Sabina	Proposal also submitted to the Nunavut Water Board (NWB) and Aboriginal Affairs and Northern Development Canada (AANDC). Correspondence noted Sabina's intention to have the Project advance through the NIRB/NWB coordinated process.
	NWB	**July 11, 2012**	NIRB received screening referral for the Project	Correspondence noted the requirement for NIRB screening under Article 12, Section 12.3.5, of the *Nunavut Agreement* as a result of Sabina's application for a Type "A" Water Licence associated with the Project.
	NIRB	**August 1, 2012**	Requested public comment on the project proposal	Distribution list included Hamlet offices in five (5) communities in the Kitikmeot region, relevant federal and territorial agencies, Inuit organizations, transboundary communities and groups, and interested parties.
1 Screening	**NIRB**	**August 20, 2012**	Ministerial extension requested	NIRB requested an extended timeline for the screening of the Project and on August 24, 2012 received the extension approval from AANDC.
	Public/Parties	**September 5, 2012**	Comments received on project proposal	Comments received from: Kitikmeot Inuit Association (KIA), Government of Nunavut (GN), AANDC, Environment Canada (EC), Fisheries and Oceans Canada (DFO), Natural Resources Canada (NRCan), Transport Canada (TC), Canadian Arctic Resources Committee (CARC), and Yellowknives Dene First Nation (YKDFN).
	NIRB	**September 25, 2012**	Screening decision report issued to the responsible Minister	Project recommended for review under the *Nunavut Agreement* Article 12, Part 5 or Part 6.
	Responsible Minister (AANDC)	**December 17, 2012**	Minister issued decision supporting the NIRB's recommendation	Project referred to the NIRB for review under Article 12, Part 5 of the *Nunavut Agreement*. Minister made special reference to transboundary impacts and potential cumulative effects.

Review Step	Party	Timeline	Process Steps	Notes
	NIRB	**December 17, 2012**	Minister's decision distributed and NIRB review commences	Parties were notified of the Minister's decision and requested any input pertaining to the Back River distribution list prior to continuing with the NIRB's review.
1 Community Scoping	**NIRB**	**December 21, 2012**	*Draft* Scope released for comment	Correspondence included the NIRB's *Draft scope* list and information on the early stages of the NIRB's review of the Project.
	Public/Parties	**February 4, 2013**	Comments received on the *Draft* Scope of assessment for the NIRB's Review of the Project	Comments received from: Sabina, KIA, GN, AANDC, EC, DFO, NRCan, TC, CARC, Canadian Parks and Wilderness Society (CPAWS), North Slave Métis Alliance (NSMA), and the YKDFN.
	NIRB	**February 5 - 20, 2013**	Public scoping meetings	Meetings held in the Kitikmeot communities of Cambridge Bay, Kugluktuk, Kugaaruk, Gjoa Haven, Taloyoak, and the community of Yellowknife in the Northwest Territories.
2 Guidelines Development	**NIRB**	**February 8, 2013**	Revised *Draft* Scope and *Draft* Environmental Impact Statement (EIS) Guidelines distributed for comment	
	Public/Parties	**March 11, 2013**	Comments received for the Revised *Draft* Scope and *Draft* EIS Guidelines	Comments received from: KIA, GN, Government of Northwest Territories (GNWT), AANDC, DFO, EC, NRCan, TC, CARC, CPAWS, Anne Gunn, and Sabina.
	NIRB	**March 18, 2013**	Final Scope released and Revised *Draft* EIS Guidelines distributed for comment	Correspondence included the Final Scope of assessment for the Project, revised *Draft* EIS Guidelines and requested expressions of interest for attendance at the EIS Guidelines workshop.
	NIRB	**April 5, 2013**	Public scoping meeting summary report released	Report summarized community scoping sessions
	Public/Parties	**April 8, 2013**	Comments received for the Revised *Draft* EIS Guidelines	Comments received from: GN, GNWT, AANDC, DFO, EC, NRCan, TC, NSMA, Sabina, and the KIA (submitted April 19, 2013 and accepted as late submission).
	NIRB	**April 9, 2013**	Notification to parties that no EIS Guidelines workshop would be held	Decision to not hold an EIS Guidelines workshop as a result of comments received from interested parties.

Review Step	Party	Timeline	Process Steps	Notes
	NIRB	**April 30, 2013**	Issued finalized EIS Guidelines to the Proponent	
3 Draft EIS	**Sabina**	**January 20, 2014**	Proponent developed and submitted *Draft* EIS (DEIS) to the NIRB	DEIS included specific references to applications for various site preparations and other pre-development works to be considered by the NIRB as potential exceptions from review under Section 12.10.2(b) of the *Nunavut Agreement* (see March 21 and April 7, 2014 exception requests).
4 Conformity Review of DEIS	**NIRB**	**February 11, 2014**	Conformity determination issued and commencement of technical review	Technical review period included 30-day information request period.
	NIRB	**March 21, 2014**	Additional information requested regarding scope of requested exceptions in DEIS	Additional information requested from Sabina regarding the scope of requested exceptions submitted in Sabina's DEIS to support the NIRB's assessment of Sabina's requests to except activities from review.
	Sabina/Public/ Parties	**March 24, 2014**	Submission of Information Requests (IRs) by parties	IRs received from: KIA, GN, GNWT, AANDC, DFO, EC, NRCan, TC, Łutsel K'e Dene First Nation (LKDFN), YKDFN, and Sabina.
	NIRB	**March 24 - April 1, 2014**	Community information meetings	Meetings held in the communities of Kugluktuk, Cambridge Bay, Gjoa Haven, Kugaaruk, and Taloyoak within Nunavut as well as Yellowknife, NWT regarding the status of Sabina's Back River Project Proposal and how the public can participate in the NIRB's Review process.
5 Technical Review of DEIS	**Sabina**	**March 28, 2014**	Proponent submitted clarification regarding scope of requested exceptions in DEIS to the NIRB	Correspondence noted that items contained within Volume 12 of the DEIS were submitted for the Board's consideration as works that should be excepted from the Review of the Back River Project Proposal and that submissions were considered complete.
	NIRB	**April 7, 2014**	IRs distributed to appropriate parties	IRs requested additional information from the Proponent or other parties.
	NIRB	**April 7, 2014**	NIRB requested additional information pertaining to the works and activities Sabina requested to be excepted from the Review.	Correspondence issued to Sabina seeking clarity as to whether there was overlap between activities Sabina was requesting should be excepted from the Review and activities that may have already been previously assessed by the NIRB under individual exploration and development files associated with the Back River Project. The NIRB also detailed process and procedure for the exception applications.

Review Step	Party	Timeline	Process Steps	Notes
	Sabina	**May 30, 2014**	Issued correspondence to the NIRB regarding the submission of an updated application package	Sabina issued correspondence to the NIRB regarding its intention to submit an updated exception application package after having received further direction from the NWB.
	Sabina/Parties	**July 23, 2014**	Responses to IRs submitted to the NIRB	Responses received from: GN, GNWT, AANDC, Canadian Coast Guard, DFO, EC, NRCan, TC, and Sabina
	NIRB	**July 31, 2014**	Commencement of 60-day technical review period	Technical review comments were requested from parties within the notice in addition to the scheduling of the technical meeting and Pre-hearing Conference (PHC).
	NIRB	**August 7, 2014**	Public Information Meetings Summary Report distributed	
	Public/Parties	**October 10 & October 14, 2014**	Technical review comments on the DEIS submitted to the NIRB	Extension of timelines to October 10, 2014 formally granted. Technical review comments received on October 10, 2014 from: GN, GNWT, AANDC, EC, DFO, and NRCan. Technical review comments received on October 14, 2014 from the KIA and TC.
	Sabina	**October 20, 2014**	Amended exception application package submitted to the NIRB	Amended application for exception of exploration and development works from the Review submitted as Sabina's "Site Preparation Work" application package.
	Sabina	**October 24 & October 30, 2014**	Responses to technical review comments submitted to the NIRB	
	NIRB	**October 27, 2014**	NIRB issued correspondence to Sabina regarding the requirement for a request from an authorizing agency	Correspondence included details regarding the requirement to have an official request from an authorizing agency to commence the NIRB's consideration of the "Site Preparation Work" application for exceptions from the Review.
6 Technical Meeting	**NIRB**	**November 13-15, 2014**	Technical meeting, Cambridge Bay	Parties in attendance included: KIA, GN, GNWT, AANDC, EC, DFO, NRCan, TC, and Sabina.
7 Pre-hearing Conference	**NIRB**	**November 17-19, 2014**	Community roundtable and PHC, Cambridge Bay	Parties in attendance included: KIA, GN, GNWT, AANDC, EC, DFO, NRCan, TC as well as Community Representatives from seven (7) Nunavut communities/settlements in the Kitikmeot region as well as seven (7) community members from the Northwest Territories.

Review Step	Party	Timeline	Process Steps	Notes
	KIA	**November 24, 2014**	KIA forwards referral for Sabina's applications for access to Inuit Owned Lands as part of the "Site Preparation Work" exception application	The NIRB received the KIA's screening referral and commenced its consideration of the updated "Site Preparation Work" application for exceptions from the Review.
	NIRB	**December 9, 2014**	Public comment on Sabina's 12.10.2(b) "Site Preparation Work" application	
	NIRB	**December 19, 2014**	Release of PHC Report	
	NIRB	**April 30, 2015**	NIRB issued its decision regarding Sabina's "Site Preparation Work" application	Correspondence issued to Sabina, authorizing agencies, and interested parties rejecting Sabina's application to except from the Review the activities within its "Site Preparation Work" application, and further noted that the proposed works would be considered under the NIRB's ongoing Review of the Back River Project.
	Sabina	**July 3, 2015**	Proponent released correspondence updating the NIRB on the FEIS content and submission timing	Correspondence noted the completion of Sabina's Feasibility Study, its withdrawal from the NIRB/NWB coordinated process, and removal of the George site from the mining development in the FEIS.
	Sabina	**July 8, 2015**	Proponent submitted questions to the NIRB regarding the scope of activities previously approved and the scope of activities not excepted from the Review under the NIRB's 12.10.2 decision	Correspondence issued to the NIRB as a follow up to the NIRB's 12.10.2 decision associated with the "Site Preparation Work" application to except activities from the Review. Sabina further requested clarification on whether certain proposed activities in the "Site Preparation Work" application were considered and approved within the scopes of previous screenings (NIRB File Nos. 04RN101 and 09RN006) and if they could therefore be undertaken.
	NIRB	**July 16, 2015**	Back River site visit	As directed by the Board in its PHC decision for the Back River project, Sabina provided a site tour for NIRB Board and staff to provide context to key issues related to the proposed mine site.
	NIRB	**September 25, 2015**	NIRB issued 12.4.3 screening exemptions	Screening exemption issued under Section 12.4.3 of the *Nunavut Agreement* for the proposed undertaking of approved activities through previously-screened NIRB File Nos. 04RN101 and 09RN006.

Review Step	Party	Timeline	Process Steps	Notes
	NIRB	**October 29, 2015**	Release of Site Visit Report	
8 Final EIS	**Sabina**	**November 23, 2015**	Proponent developed and submitted *Final* EIS (FEIS)	
9 Compliance Review of FEIS	**NIRB**	**December 8, 2015**	NIRB's acceptance of FEIS and commencement of technical review period	Commencement of 90-day technical review period initiated with the request for IR related to the FEIS submission.
	NIRB	**December 23. 2015**	Notice of 2016 Final Hearing and Intervenor applications distributed	Notice included dates and location of the 2016 Final Hearing as well as information on how to apply for Intervenor status.
	Public/Parties	**January 15, 2016**	FEIS IRs received by the NIRB	IRs received from: KIA, GN, GNWT, Environment and Climate Change Canada (ECCC, previously EC), DFO, Indigenous and Northern Affairs Canada (INAC, previously AANDC) NRCan, LKDFN, and NSMA.
	Sabina	**February 12, 2016**	Proponent submitted response to IRs	
	Public/Parties	**February 15-24, 2016**	Applications for Intervention Status filed	Applications received from: Burnside Hunters and Trappers Organization (BHTO), GNWT, LKDFN, YNDFN, and NSMA.
10 Technical Review of FEIS	**NIRB**	**February 18-29, 2016**	Intervention status granted to all applicants	
	Public/Parties/ Intervenors	**March 7-10, 2016**	Final written submissions received by the NIRB	Final written submissions received from: KIA, GN, GNWT, ECCC, DFO, INAC, Health Canada, NRCan, TC, BHTO, LKDFN, NSMA, and YKDFN.
	NIRB	**March 30, 2016**	2016 Final Hearing preparation session	Community information session held in Cambridge Bay.
	Sabina	**March 31, 2016**	Written responses to final written submissions submitted to the NIRB	Responses to facilitate 2016 Final Hearing.
	NIRB	**April 1, 2016**	2016 Final Hearing preparation session with NWT Community Representatives.	Meeting held in Yellowknife, NWT. Intervenors from NWT agencies also invited to attend session.

Review Step	Party	Timeline	Process Steps	Notes
11 2016 Final Hearing	**NIRB**	**April 25-30, 2016**	2016 Final Hearing held including technical sessions and community roundtable	Held in Cambridge Bay and facilitated by Elizabeth Copland, Chairperson. Parties in attendance: Sabina, KIA, GN, GNWT, Department of Justice, ECCC, DFO, INAC, NRCan, TC, BHTO, LKDFN, NSMA, YKDFN, Kitikmeot Regional Wildlife Board, Community Representatives from the seven Kitikmeot communities/settlements (Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), Cambridge Bay, Gjoa Haven, Kugluktuk, Kugaaruk, and Taloyoak), and Community Representatives from the NWT (Behchokǫ̀, Dettah, Łutsel K'e, and Wekweètì).
12 Issuance of 2016 Final Hearing Report	**NIRB**	**June 15, 2016**	NIRB issued 2016 Final Hearing Report for the Back River Project	The Board concluded that on the basis of the potential for significant adverse ecosystemic and socio-economic effects in Nunavut and also in the Northwest Territories that, in the Board's view, could not be adequately managed and mitigated, the proposed Back River Gold Mine Project should not proceed at this time.
	Sabina	**June 16, 2016 - July 20, 2016**	Proponent submitted responses to the NIRB's decision to parties and Minister	The NIRB was copied on letters and the submission of a summary response document from Sabina to the Minister of INAC in response to the NIRB's decision.
	Public/Parties/ Intervenors	**June 21, 2016 - February 6, 2017**	NIRB received letters from public, parties, and Intervenors regarding the NIRB's 2016 Final Hearing Report and the Board's decision	The NIRB received, and/or was copied on, correspondence from several parties and individuals including members of the public; former Sabina employees; an investor; a group of Elders; the hamlets of Kugaaruk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugluktuk; businesses; the Cambridge Bay Community Advisory Committee; the Northwest Territories & Nunavut Chamber of Mines; the Kugluktuk Hunters and Trappers Organization; the Spence Bay Hunters and Trappers Association; and the World Wildlife Fund, to the NIRB and/or the Minister of Indigenous and Northern Affairs regarding the Report and the Board's decision. The NIRB was also copied on correspondence between the Government of Canada and select parties, including the Kitikmeot Inuit Association, the Government of Nunavut, the Government of the Northwest Territories, the Łutsel K'e Dene First Nation, the North Slave Métis Alliance, the Tłı̨chǫ Government, and the Yellowknives Dene First Nation, related to the Review of the Back River Project and the Board's decision. Some parties expressed support for Sabina and the Project and their confidence in the proposed environmental and wildlife protection and monitoring measures as well as the potential for positive economic impacts. Other parties supported the NIRB's decision due to ongoing concerns related to the protection of the environmental and wildlife, particularly caribou.

Review Step	Party	Timeline	Process Steps	Notes
	Responsible Minister(s)	**January 12, 2017**	NIRB received the Minister's decision regarding the Back River Project	The Minister of Indigenous and Northern Affairs, writing on behalf of the Federal Responsible Ministers, including Environment and Climate Change, Fisheries and Oceans and the Canadian Coast Guard, Natural Resources, and Transport, referred the 2016 Final Hearing Report for the Back River Project back to the NIRB for further Review under Section 12.5.7(e) of the *Nunavut Agreement* to further assess deficiencies with respect to five (5) main ecosystemic issues (caribou and terrestrial wildlife; freshwater aquatic environment; marine environment; water quality (ground and surface); and climate and meteorology).
	NIRB	**January 23, 2017**	NIRB issued letter to the Proponent and parties detailing next steps in the Board's Review of the Project	The NIRB requested that Sabina provide an addendum to the Back River Final Environmental Impact Statement (FEIS Addendum) to further assess deficiencies with respect to the five (5) main ecosystemic issues identified in the Board's 2016 Final Hearing Report and the Minister's referral letter, as well as any additional relevant information for the Board's consideration. The Board also highlighted its intention to initiate a supplemental Review period which would include a public technical review of the requested FEIS Addendum, a technical meeting via teleconference to discuss outstanding technical issues, and a supplemental Final Hearing, which would result in the issuance of a revised Final Hearing Report.
	Sabina	**January 31, 2017**	NIRB received letter from the Proponent regarding an FEIS Addendum	Sabina confirmed its intention to submit an FEIS Addendum to the NIRB.
	Sabina	**February 16, 2017**	NIRB received FEIS Addendum from the Proponent	The NIRB received an FEIS Addendum from Sabina which comprised of existing, new, and updated information on various topics including community and government engagement, caribou and terrestrial wildlife, marine wildlife, freshwater aquatic environment, marine environment, water quality, and climate change.
	NIRB	**February 23, 2017**	NIRB accepted FEIS Addendum and commenced technical review period	Commencement of a 60-day public technical review period and request for final written submissions on the FEIS Addendum from parties.
	NIRB	**March 27, 2017**	NIRB released Notice of supplemental Final Hearing and Intervenor format	Notice included dates and location of the supplemental Final Hearing, and its acceptance of prior Intervenor participation.

Review Step	Party	Timeline	Process Steps	Notes
	Public/Parties	**April 24 - May 30, 2017**	Final written submissions on the FEIS Addendum received by the NIRB	Final written submissions on the FEIS Addendum received on or before April 26, 2017: KIA, GN, ECCC, DFO, INAC, HC, NRCan, TC, GNWT, LKDFN, NSMA, and the YKDFN. Final written submission on the FEIS Addendum received from the BHTO on May 23, 2017, and a supplemental submission received from the GNWT on May 30, 2017.
	Sabina	**May 18, 2017**	Written responses to final written submissions on the FEIS Addendum submitted to the NIRB	Responses to facilitate the supplemental Final Hearing.
	NIRB	**May 24, 2017**	NIRB held technical meeting via teleconference	Teleconference included KIA, GN, Northern Projects Management Office (NPMO), Department of Justice (DOJ), ECCC, DFO, INAC, NRCan, TC, GNWT, and Sabina.
	Sabina	**May 25, 2017**	The NIRB received a motion and confidential letter from the Proponent (see Section 1.9.2 of this report)	Sabina submitted two (2) documents to the Board in accordance with the NIRB's Rules of Procedure for consideration of confidential financial information as part of its decision; issue further raised during the Public Hearing.
	NIRB	**May 30, 2017**	Supplemental Final Hearing Community Representative Orientation Session held	Orientation held in Cambridge Bay for Nunavut and NWT Community Representatives attending the Public Hearing.
	NIRB	**May 31 – June 3, 2017**	Supplemental Final Hearing held including technical sessions and community roundtable	Public Hearing held in Cambridge Bay facilitated by Phillip (Omingmakyok) Kadlun, NIRB's Vice-Chairperson. Parties in attendance: Sabina, KIA, GN, GNWT (via teleconference), DOJ, ECCC, DFO, INAC, NPMO, NRCan, TC, BHTO, NSMA, Community Representatives from the seven (7) Kitikmeot communities/settlements (Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), Kugluktuk, Cambridge Bay, Gjoa Haven, Kugaaruk, and Taloyoak), and Community Representatives from the NWT (Behchokǫ̀, Łutsel K'e, and Wekweètì).

1.2.2 Applications for Activities Excepted from the Review

On January 20, 2014 the NIRB acknowledged receipt of Sabina *Draft* Environmental Impact Statement (DEIS) submission for the Back River Gold Mine Project and, on February 11, 2014, provided notification to Sabina that the DEIS conformed to the NIRB's EIS Guidelines. The DEIS included specific references to applications for various site preparation and other pre-development works to be considered by the NIRB as potential exceptions from the Review process pursuant to Article 12, Section 12.10.2(b) *Nunavut Agreement*. The various applications for authorizations for these works were also included as appendices to Volume 12 of the DEIS.

Section 12.10.2 of the *Nunavut Agreement* provides that certain types of activities may be excepted from an on-going review as follows:

> 12.10.2 Notwithstanding Section 12.10.1, where a project proposal has been referred for review pursuant to Part 5 or 6, approvals or licences for exploration or development activities related to that project may be issued if:
>
> (a) the activity falls within Schedule 12-1; or
>
> (b) the activity can, in the judgement of NIRB, proceed without such a review.

On March 21 and April 7, 2014 the NIRB requested that Sabina provide clarification on the scope of the requested exceptions; Sabina responded that the various applications contained within Volume 12 of the DEIS had been intended for the Board's consideration as exceptions from Review, and were complete application. Sabina further noted that the applications had not yet been submitted to relevant agencies (separately from the DEIS submission to the NIRB) to initiate associated licensing, permitting or other approval processes. On May 30, 2014 the NIRB received notification from Sabina of their intentions to submit an updated application package after receiving further direction from the Nunavut Water Board.

On October 20, 2014 the NIRB received an updated application package from Sabina seeking an exception from review for specified exploration and/or development activities in support of its "Site Preparation Work" proposal. On October 27, 2014 the NIRB issued correspondence to the Proponent noting that receipt of a formal request from an authorizing agency to screen the proposed works would be required for the NIRB to commence its assessment of the updated exception application package. On November 24, 2014 the NIRB received a referral from the Kitikmeot Inuit Association to screen the applications for access to Inuit Owned Lands, and consequently the NIRB commenced its assessment of the updated Site Preparation Work application package pursuant to *Nunavut Agreement* Section 12.10.2(b). Sabina requested approval for site preparation work at both the Goose Property and at the proposed Marine Laydown Area at Bathurst Inlet, with proposed commencement of activities in 2015 for an approximate six (6) month construction period. The proposed activities included:

- At the Goose Property:
  - An all-weather airstrip extension;
  - Realignment of Rascal Lake outflow stream;
  - New quarry within the future Umwelt open pit footprint;
  - Development of a five (5) kilometre (km) all-weather road and six (6) km ice-road to gain

access to the new quarry; and,

- At Bathurst Inlet: establishment of a temporary laydown area for the staging of fuel and supplies arriving by barge.

On December 9, 2014 the NIRB invited comments from interested parties on Sabina's 12.10.2(b) application and conducted a thorough review of the technical matters pertaining to the proposal. On April 30, 2015 the Board provided a determination to the respective authorizing agencies finding that due to the gaps in the supporting information provided, the Proponent did not establish that the proposed activities in the "Site Preparation Work" proposal would not cause significant adverse impacts or public concern if allowed to proceed without being subject to the Review. In the Board's view, the proposed activities included in the "Site Preparation Work" proposal required additional assessment for the Board to be confident that the potential for impacts associated with the activities is more thoroughly and adequately understood before the activities are permitted to proceed. As a result, these activities continued to be assessed through the Part 5 Review of the Back River Project.

Activities related to the ongoing exploration and research of the "Beechy Lake Area" (NIRB File No. 08EA084) as well as exploration supplies staging and movement via the "Winter Roads – Hackett, George and Goose Camps" project (NIRB File No. 09RN066) could still be permitted to proceed.

On July 8, 2015 the NIRB received correspondence from Sabina in follow-up to the above "Site Preparation Activities" proposal associated with the Project. Sabina noted that it was submitting the correspondence as a result of the NIRB's decision to reject its application for site preparation works to be excepted under Section 12.10.2(b) of the *Nunavut Agreement*, which referenced some activities in the application being associated with exploration activities previously approved to proceed. In follow up to the reference, Sabina requested confirmation that the activities listed in its July 8, 2015 letter were considered within the scope of the previous screenings (NIRB File Nos. 04RN101[30] and 09RN066[31]). The proposed activities encompassed the transportation and staging of supplies to the Bathurst Inlet area, in continuation of previously approved exploration activities, specifically:

- Use of the Temporary Laydown Area at Bathurst Inlet;
- Shipping and temporary storage of fuel and equipment; and
- Continued operation of temporary camp.

After completing a review of the information provided in support of the request for confirmation of activity exemption, the NIRB noted that it was of the understanding that the proposed activities did not change the general scope of the original project activities, and that the exceptions noted in *Nunavut Agreement* 12.4.3(a) and (b) did not apply. Therefore, this application was exempt from the requirement for screening pursuant to Section 12.4.3 of the *Nunavut Agreement* and the activities therein remained subject to the terms and conditions recommended in the two (2) associated screening decision reports.

[30] NIRB Screening Decision Report, NIRB File No. 04RN101, September 21, 2004.
[31] NIRB Screening Decision Report, NIRB File No. 09RN066, September 2, 2010.

1.3 MANDATE OF THE BOARD

As referenced by the Board in the 2016 Final Hearing Report[32] and during the Board's further consideration of the Back River Project under Article 12, Section 12.5.7(e) of the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada* (*Nunavut Agreement*) throughout the Board's assessment of the Back River Project Proposal, the Board has been guided by the Board's primary objectives, as set out in Article 12, Part 2, Section 12.2.5 of the *Nunavut Agreement:*

> 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.

Throughout the Board's assessment of the Back River Project Proposal, the role of the Board has been to gauge and define the extent of the likely regional and transboundary impacts of the Back River Project Proposal by conducting a thorough review of the predicted ecosystemic and socio-economic impacts of the proposed Back River Project. Reflecting the Board's mandate, on the basis of the evidence before the Board at that time, and as set out in the NIRB's 2016 Final Hearing Report[33] in June 2016 the Board recommended to the Federal Ministers with responsibility for regulating the Back River Project that due to potential for significant adverse effects on caribou and other terrestrial wildlife, fish, the freshwater and marine environments and the potential for adverse socio-economic effects associated with these ecosystemic effects the Back River Project Proposal should not be allowed to proceed. The Board noted that there was a high level of uncertainty regarding the efficacy and adaptability of measures designed to mitigate these effects and accordingly, the Board did not have confidence that these potential adverse effects could be managed and/or mitigated to the render them insignificant.

On January 12, 2017 the Minister of Indigenous and Northern Affairs, writing on behalf of the Federal Responsible Ministers including Environment and Climate Change, Fisheries and Oceans and the Canadian Coast Guard, Natural Resources Canada, and Transport Canada, referred the 2016 Final Hearing Report for the Back River Project back to the NIRB for further review under Section 12.5.7(e) of the *Nunavut Agreement*.

In referring the Report back to the Board for further review or public hearings, the Ministers provided the following additional guidance that added to the Board's specific mandate when conducting the supplemental Final Hearing undertaken by the Board May 31 to June 3, 2017:

> *In our view, based on the process to date, it is premature to conclude that the Project would lead to unacceptable or unmanageable ecosystemic or socioeconomic impacts. There are a number of areas where there was insufficient information presented in the Report to support the conclusions of the Board, and where further information is required so that the ministers may understand the rationale behind the conclusions presented by the Board prior to making a decision on whether the project should proceed. This is particularly important in*

[32] See NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report) at Section 1.3.

[33] See NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report).

areas where the Board has expressed a lack of confidence or significant uncertainty while the Report and the broader record indicates that many of the participants (including Indigenous and non-Indigenous witnesses and subject matter experts) expressed confidence that the measures presented could mitigate and manage potential adverse effects to an acceptable level. [34]

Reflecting this additional direction and the Board's general mandate, the focus of the NIRB's further consideration of the Back River Project Proposal conducted in 2017 was on those sections of the previous assessment identified as deficient by the Minister and where the Board's 2016 Final Hearing Report expressed particular concern and uncertainty about the potential for significant adverse ecosystemic and socio-economic effects:

- caribou and terrestrial wildlife;
- freshwater aquatic environment;
- marine environment;
- water quality (ground and surface); and
- climate and meteorology.

1.4 JURISDICTION OF THE BOARD TO CONDUCT A REVIEW

The Board has jurisdiction over the original review of the Back River Project Proposal pursuant to Article 12, Parts 5 (Review of project proposals by NIRB), 12 (Application) of the *Nunavut Agreement*. The on-going jurisdiction of the Board to solicit further information from the Proponent and parties to address the five areas of deficiency identified by the Minister and to conduct a supplemental Final Hearing to further assess these issues is provided for in Article 12, Section 12.5.7(e), which states as follows:

> 12.5.7 Upon receipt of the NIRB report, the Minister shall:
>
> (e) where the report is deficient with respect to ecosystemic and socio-economic issues, refer the report back to NIRB for further review or public hearings; upon such further review or hearings, NIRB shall submit a further report to the Minister which shall be accepted or rejected in accordance with Sub-sections (a), (b), (c) or (d).

In addition, reflecting the integrated regulatory system established under the *Nunavut Agreement*, when a Review of a project proposal is required under Article 12, Part 5 of the *Nunavut Agreement*, Section 12.10.1 prohibits the issuance of any licences or approvals that would be required in order to allow the project to proceed until after the required Review has been completed and a NIRB project certificate is issued. Consequently, other than the limited exceptions of exploration and development activities, no permits, licences or authorizations for activities within the scope of the Back River Project as assessed have been granted to date.

[34] Bennett, C., Minister of INAC, Referral to the NIRB Under Article 12, Section 12.5.7(e) , NIRB File No. 12MN036, January 12, 2017 at p. 2.

1.5 PURPOSE AND STRUCTURE OF THIS REPORT

This revised Final Hearing Report is intended to supplement and replace the NIRB's 2016 Final Hearing Report[35] that was issued in June 2016. The Report has been organized to present, in a structure largely reflecting the structure of the Final Environmental Impact Statement (FEIS) and the subsequent Addendum to the FEIS supplied in 2017 by the Proponent to address the 5 areas of deficiency identified by the Minister, the comprehensive and complete results of the NIRB's Review of the Back River Project. This report includes the NIRB's conclusions and recommendations to the Minister of Indigenous and Northern Affairs (the Minister) in respect of all the ecosystemic and socioeconomic effects assessed by the NIRB throughout the Board's Review, including all information filed with the Board in support of both the 2016 Final Hearing and the supplemental Final Hearing conducted in 2017 and reflecting the Board's authority under the *Nunavut Agreement*. In the preparation of this revised Final Hearing Report, the Board is satisfied that it has complied with its obligations under the *Nunavut Agreement* and the direction of the Minister provided in January 2017. The Board is now confident that there is sufficient information to draw conclusions and make recommendations regarding the potential effects of the project as expressed in this report.

Further, having recommended that the Back River Project Proposal should now be allowed to proceed, the Board has also provided in this report recommendations regarding the terms and conditions that are considered by the Board to be necessary to manage, mitigate and monitor the potential ecosystemic and socioeconomic effects of the Back River Project as it is developed.

This report is structured to meet the reporting parameters in Article 12, Sections 12.5.6 and 12.5.7(e) of the *Nunavut Agreement*, which prescribe:

> 12.5.6 After reviewing the project proposal, NIRB shall issue a report to the Minister and the Proponent containing:
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> (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.
>
> 12.5.7 Upon receipt of the NIRB report, the Minister shall:
>
> (e) where the report is deficient with respect to ecosystemic and socio-economic issues, refer the report back to NIRB for further review or public hearings; upon such further review or hearings, NIRB shall submit a further report to the Minister which shall be accepted or rejected in accordance with Sub-sections (a), (b), (c) or (d).

[35] See NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report).

1.6 EVIDENTIARY ISSUES

1.6.1 The Burden and Standard of Proof

As noted previously, throughout the Board's Review of the Project, the Proponent bears the onus of proof and must demonstrate, on a balance of probabilities, that the Project is consistent with the Board's mandate and requirements of the *Nunavut Agreement*.

In the context of this Review and the Board's further consideration of the issues identified in the Minister's January 2017 referral back to the Board, the onus has been on the Proponent to provide the Board with an environmental impact statement (EIS) and Addendum to the EIS that fully reflected the NIRB-issued guidelines and directions, as well as the Minister's directions. In addition, the EIS and EIS Addendum must provide the Board with the information necessary to adequately assess the potential ecosystemic and socio-economic impacts of the Back River Project. In respect of the FEIS Addendum submitted by the Proponent to address the areas of deficiency identified by the Minister's referral back to the NIRB under Article 12, Section 12.5.7(e) of the *Nunavut Agreement*, the NIRB requested that the FEIS Addendum focus on providing additional information on the specific issues noted by the Minister, providing the Board and parties with any further supporting information on predicted impacts and anticipated effectiveness of proposed mitigation measures as well as updated details on negotiations, communications, and the results of community consultations conducted since the Board's Report was issued. In general, the Board determined that the information supplied provided the additional detail considered by the Board to be necessary to further assess the significant adverse ecosystemic and socio-economic effects to caribou and terrestrial wildlife, freshwater aquatic environment, marine environment, water quality (ground and surface), and climate and meteorology.

In addition to the overall onus on the Proponent during the Board's assessment, individual participants throughout the assessment process were also required to meet the burden of proof for specific information or assertions offered to the Board. As stated in the NIRB Rules of Procedure, any party offering evidence has the burden of ensuring that they have provided the Board with sufficient information to support that participant's position.[36] The standard of proof in this Review required a careful balancing of all information filed in writing with the Board prior to, and during the 2016 Final Hearing and prior to, and during the supplemental Final Hearing conducted by the Board in 2017. It is important to highlight that the Board's decision and recommendations as expressed in this Report are based on the consideration of all relevant information provided to the Board in respect of the potential ecosystemic and socio-economic effects of the Back River Project Proposal throughout the NIRB's Review of the Project, including the written and oral submissions provided by all parties in association with the 2016 Final Hearing and the supplementary written and oral submissions provided by all parties in association with the supplemental Final Hearing undertaken by the Board in 2017.

In the Board's consideration of all these submissions, where there is conflicting information, the Board has the authority to decide which information will be accepted by the NIRB in whole or in part. The sections of this Report discussing the Board's Views address how the Board balanced the information provided on key topics, including the instances where conflicting views were presented to the Board for consideration and noting, where significant conflicting views were expressed, the information preferred by the Board and the rationale supporting the Board's conclusions.

[36] NIRB Rules of Procedure, September 3, 2009, Rule 32.1 at p. 18.

1.6.2 The Precautionary Principle and Adaptive Management

As is the case with all the Board's Reviews, in areas where there are substantial gaps in data or uncertainty regarding predicted effects, the Board is guided by the "precautionary principle". The concept as cited in the EIS Guidelines issued by the NIRB for the Back River Project Proposal, and that guided this Review, as well as the Board's subsequent further consideration of some key effects is stated as follows:

> Where there are threats of serious or irreversible damage, lack of full scientific certainty must not be used as a reason for postponing cost-effective measures to prevent environmental degradation.[37]

As noted in the Board's 2016 Final Hearing Report, [38] there were several key effects identified during the course of this review to which the precautionary principle and adaptive management clearly apply. As outlined in greater detail in this Report, when the precautionary principle applies, it is the Proponent who bears the burden of proof to show that despite uncertainty, the potential for adverse environmental impacts can be effectively mitigated or reversed. The onus on the Proponent created by the precautionary principle in the case of the Back River Project Proposal was specifically set out in the NIRB's Guidelines. The EIS Guidelines issued by the NIRB for the Back River Project 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;
- 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 based on the data available at the time of the assessment. The Board also wishes to highlight that, as in recent reviews,[39] the Board has analyzed the following factors to determine whether a more stringent and protective version of the precautionary principle should apply to the assessment of potential for effects on specific Valued Ecosystem Components (VECs) and Valued Socio-Economic Components (VSECs):

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

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[37] NIRB Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River Project, NIRB File No. 12MN036, April 30, 2013.

[38] NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report).

[39] See for example the discussion in Section 1.6.2 in NIRB File No. 08MN053, Final Hearing Report for the Mary River Project, Baffinland Iron Mines Corporation, September 14, 2012, pp. 11-13.

iv. public concern.

When the Board has concluded that a higher standard of the precautionary principle is called for, the Board requires evidence of positive and preventative actions that will be taken to ensure that where there is potential for a serious risk of environmental degradation, and high levels of uncertainty, the measures proposed to limit or reduce the potential for adverse impacts are highly protective and do not require evidence of impact before they are triggered. In such cases, the precautionary approach requires the Proponent to incorporate a "safety margin" into monitoring and mitigation measures and also dictates that 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 preventative measures, the more rigorous the monitoring and the trigger for implementing mitigation measures should be protective and designed to avoid impacts, not simply respond to impacts after they have occurred). As noted in the Board's 2016 Final Hearing Report associated with the Back River Project, the Board has concluded that due to the location of the Project in a pristine and relatively untouched environment, this more stringent approach to the precautionary principle is appropriate and should be applied to the assessment of ecosystemic effects.

Implementing a precautionary approach to decision-making in this context 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. The implementation of adaptive management is both consistent with, and supported by, the NIRB's project monitoring jurisdiction as set out in Part 7 of Article 12 of the *Nunavut Agreement*. In addition, Part 8 of Article 12 of the *Nunavut Agreement* 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.

During the course of this Review, although the precautionary principle and adaptive management were foundational to the entire assessment, these concepts figured most prominently in discussions regarding long-term tailings and waste rock management,[40] water and sediment quality,[41] reclamation planning,[42] potential effects on seal pupping and seal lairs at the Marine Laydown Area[43] and was

[40] See for example the discussions on this topic in the NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 567-569 and pp. 579-580 and NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 143-150; and June 1, 2017, pp. 521-522 and 527.

[41] See for example submissions from the parties in the NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1078-1079 and 1154-1155 and A. Wilson, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 482 and R. Theoret, Gosselin, Indigenous and Northern Affairs Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 523 .

[42] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1222, lines 2-7.

[43] M. D'Aguiar, Fisheries and Oceans Canada, the NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1177, lines 11-22 and M. D'Aguiar, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 505-506.

extensively canvassed in the discussion of the potential for the Project to have effects on caribou in both the short and long-term at both the 2016 Final Hearing and the supplemental Final Hearing.[44] Sections 4: Ecosystemic Effects and 6.4: Cumulative Effects of this Report contains the detailed discussions in relation to the manner in which the precautionary principle and adaptive management have factored into the Board's assessment of specific potential effects.

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, which encompasses Inuit Traditional Knowledge, 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.[45] With its emphasis on personal observation, collective experience, and oral transmission over many generations, Inuit Qaujimaningit provides factual information on such matters as ecosystem function, social and economic wellbeing, and explanations of these facts and causal 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 EIS and the FEIS Addendum, 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 and FEIS Addendum, as well as with respect to questions or responses provided by the intervenors, Elders, Inuit harvesters and other community members, the Board benefitted greatly from community members who freely shared their extensive Inuit Qaujimaningit with the Board during the approximately four (4) days of Community Roundtables at the 2016 Final Hearing and the supplemental Final Hearing.

1.7 SCOPE OF THE NIRB'S ASSESSMENT AND ENVIRONMENTAL IMPACT STATEMENT GUIDELINES

On December 26, 2012 the Board issued its screening decision report to the Minister of Aboriginal Affairs and Northern Development. On the basis of the NIRB's screening of the project proposal and comments received, 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 *Nunavut Agreement*:

- Potential impacts to water quality and fish and fish habitat;

[44] See for example discussions on this topic in the NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 272-275; April 28, 2016, pp. 900-905; and April 29, 2016, pp. 1076-1078 and NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 184-186, pp. 217-219, pp. 251-253; and June 1, 2017, p. 419 and pp. 452-453.

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

- Potential impacts to waterbodies or water crossings;
- Potential impacts to air quality;
- Potential impacts to wildlife and wildlife habitat;
- Potential impacts to the Bathurst caribou range and the people of the Yellowknives Dene First Nation (YKDFN) who rely on the herd;
- Potential impacts to traditional land use activities;
- Potential positive and negative socio-economic impacts to Kitikmeot and transboundary communities, particularly Yellowknife, Northwest Territories (NWT), due to the Project's proximity to the Nunavut-NWT Territorial Boundary;
- Potential for public concern;
- Details regarding geochemical characterization of waste rock and mitigation measures for potential acid rock drainage and metal leaching;
- Details related to location and management of the proposed tailings management and Tailings Storage Area; and
- Potential cumulative effects resulting from increasing mineral development in the Kitikmeot Region.[46]

The Minister responded to the NIRB's Screening Decision Report in a letter dated December 14, 2012 (and received by the NIRB on December 17, 2012) directing the Board to undertake a review of the project proposal under Article 12, Part 5 of the *Nunavut Agreement*. The Minister also responded to the following issues of concern identified in the NIRB's Screening Decision Report for this file:

- *Transboundary Impacts* – The Minister noted the proximity of the proposed Back River Project to the Bathurst caribou calving ground and acknowledged that the Board's review must consider the potential transboundary impacts upon potentially affected communities and groups dependent on the resource. The Minister recommended that the Board encourage the participation of these groups to ensure a thorough assessment of potential impacts and proposed mitigation measures.
- *Potential Cumulative Effects* – The Minister acknowledged the potential for cumulative impacts and recommended that any cumulative impacts assessments undertaken consider the proposed project in combination with reasonably foreseeable mine and transportation infrastructure developments.

The Minister added that although it would be unable to provide participant funding for the Review of the proposed Back River Project, he expressed his confidence in the NIRB's Part 5 Review process to provide sufficient and meaningful opportunity for participation by potentially affected groups.

On December 21, 2012 the NIRB distributed a preliminary scoping list for the proposed project with these issues in mind, and from February 5-20, 2013 conducted public scoping sessions in Yellowknife (NWT) as well as in the five (5) communities of the Kitikmeot region identified by the NIRB as potentially affected by the proposed Project: Kugluktuk, Cambridge Bay, Gjoa Haven, Kugaaruk, and Taloyoak. As indicated in the Board's Public Scoping Meeting Summary Report, released on April 5, 2013, the scoping

[46] NIRB Screening Decision Report, NIRB File No. 12MN036, September 25, 2012.

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 March 18, 2013 the NIRB invited parties to provide comments on the revised *Draft* EIS Guidelines for the Project. 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. However, the purpose of the EIS Guidelines is to assist the Proponent and participants during the Review by identifying the information requirements and expectations for the EIS that will form the basis for the Board's 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 April 9, 2013 the Board distributed correspondence noting that after considering all submitted comments on the *Draft* EIS Guidelines, there were no outstanding items requiring further discussion and that consequently a guidelines workshop would not be required. On April 30, 2014 the NIRB provided the Proponent with the final EIS Guidelines for the Project, in accordance with Article 12, Section 12.5.2 of the *Nunavut Agreement* and after due consideration of the issues identified during the Board's Screening, the issues identified by the Minister, and the comments received during the scoping process.[47]

On January 20, 2014 the NIRB received Sabina's DEIS for the Back River Project Proposal and commenced an internal review to determine whether the submission conformed to the NIRB's EIS Guidelines. On February 11, 2014 the NIRB issued correspondence that it found that the DEIS conformed to the EIS guidelines and distributed the DEIS for review and comment. Following public information meetings, information requests, technical review, and the Pre-hearing Conference (PHC) associated with the DEIS, on December 19, 2014 the NIRB provided further direction to the Proponent in its PHC Decision regarding additional information required by the Board and the parties in the FEIS.[48]

On July 3, 2015 the NIRB received correspondence from Sabina that it had proposed to reduce the scope of the Project and to withdraw from the NIRB-Nunavut Water Board (NWB) coordinated process. Sabina specifically proposed to remove the George mine site from the development proposal and to modify the Project Development Area for the Goose development site. While the George mine site was removed from the scope as a proposed mine site, the George exploration area is included in the general scope of the Project as a site of ongoing exploration. Sabina further provided an updated list of commitments previously identified during the NIRB's PHC report in response to the proposed change in scope. On September 9, 2015 the NIRB distributed the proposed amended list of commitments to parties for comment. On September 28, 2015, after considering Sabina's request and receiving feedback on the amended commitment list from all parties involved in developing the list, the NIRB distributed correspondence to the Proponent approving the removal of two (2) commitments and requesting that Sabina continue to track all commitments included in Appendix 1 and 2 of the NIRB's PHC Decision. The NIRB further noted that Sabina would be expected to provide clarification where information and commitments related to the water licensing process may be deferred as a result of Sabina's request to withdraw from the NIRB-NWB coordinated process.

[47] NIRB Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River Project, NIRB File No. 12MN036, April 30, 2013.

[48] NIRB Pre-hearing Conference Decision Concerning the Back River Project, File No. 12MN036, December 19, 2014.

On November 23, 2015 the Board received the completed FEIS from Sabina, and on December 8, 2015 the NIRB provided its determination that the Proponent's FEIS complied with the requirements of the EIS Guidelines and the additional requirements identified in the PHC Decision, and remitted the FEIS to the parties for technical review. A conformity determination simply means that the information in the FEIS complied with the requirements of the EIS Guidelines, and that the matter could proceed to Final Hearing. A positive compliance determination notes that the document complies to the requirements of the EIS Guidelines and the NIRB's PHC decision; however it does not mean that the information in the FEIS is necessarily sufficient to discharge the burden of persuading the Board that the Project can, in the Board's judgment, proceed. On December 8, 2015 the NIRB initiated the technical review process by requesting that interested parties submit information requests and final written submissions to facilitate their review of the FEIS submission. Parties submitted IRs by January 18, 2016 and on January 25, 2015 Sabina was provided an opportunity to respond. Sabina submitted responses to IRs on February 12 and 26, 2016. The NIRB received final written submissions in advance of the 2016 Final Hearing from parties by March 10, 2016 and on March 11, 2016 provided Sabina an opportunity to respond. Sabina submitted its responses to these final written submissions March 31, 2016.

With respect to the supplemental Final Hearing, the scope of the FEIS and the EIS Guidelines were not altered by the Board's further consideration of the five (5) areas of deficiency identified in the Minister of Indigenous and Northern Affairs' correspondence of January 12, 2017 referring the 2016 Final Hearing Report for the Back River Project back to the NIRB for further review under Section 12.5.7(e) of the *Nunavut Agreement*. To ensure, however that the Proponent and all parties had an opportunity to consider these areas in greater depth prior to Sabina's preparation of the FEIS Addendum and parties' comment submissions, on January 23, 2017, the Board issued the following direction regarding the scope of the additional information sought by the Board to address the areas of deficiency, in respect of effects to caribou and terrestrial wildlife, freshwater aquatic environment, marine environment, water quality (ground and surface), and climate and meteorology. The Board also requested that the Proponent provide the Board and parties with any further supporting information on predicted impacts and anticipated effectiveness of proposed mitigation measures, updated details on negotiations, communications, and the results of community consultations conducted since the Board's Report was issued.

Sabina's Addendum to the Final Environmental Impact Statement (FEIS Addendum) for the Back River Project was provided to the NIRB on February 16, 2017. Parties were then provided with an opportunity to review the FEIS Addendum and provide final written submissions to the Board on or before April 24, 2017. After reviewing submissions, by May 15, 2017 the Proponent filed a detailed response to issues raised by parties. A technical meeting was held by teleconference on May 24, 2017 to further discuss the full scope of the issues addressed in the FEIS Addendum in advance of the supplemental Final Hearing held in Cambridge Bay on May 31 to June 3, 2017.

1.8 KEY ISSUES

The NIRB received technical review comments on the Draft Environmental Impact Statement and during associated technical meetings, comments provided by Community Representatives during the Community Roundtable Sessions, and input by parties during the Pre-hearing Conference (PHC) for the Back River Project held in November 2014. The Board identified the following key issues within its PHC Report, issued on December 19, 2014, to be addressed by Sabina in the preparation of the FEIS:

- Engagement efforts with communities, residents and organizations in the Kitikmeot region regarding planned project shipping, including a revised assessment of the marine environment;
- Consideration of project infrastructure in terms of waste management, water management, and relevant mitigation and monitoring measures;
- Updates to draft management, mitigation, and monitoring plans for the proposed development;
- Further discussion and assessment of potential project impacts to caribou and caribou harvesting, mitigation, adaptive management and monitoring measures;
- Address areas of uncertainty in impact predictions; and
- Provide revisions to its cumulative effects assessment.[49]

In the PHC Decision the Board further identified the following issues to be addressed by parties within their written submissions and at the 2016 Final Hearing:

- Kitikmeot Inuit Association: Discussion of the status of the Inuit Impact and Benefit Agreement negotiations, with a focus on non-confidential details and any progress made with addressing concerns of the residents of local communities related to potential project effects.
- Government of Nunavut: Discussion of how lessons learned from approved mining developments such as the Meadowbank Gold Mine and the Mary River Iron Mine may have impacted the cost, timing, and delivery of public services and programs under the responsibility of the Government of Nunavut (e.g., daycare, education, policing, health care, etc.).
- Government of Nunavut and Government of the Northwest Territories: Population health of caribou herds in proximity to the proposed development area, particularly the Bathurst caribou herd. A discussion of ongoing and/or planned harvesting restrictions and other conservation measures in Nunavut and the Northwest Territories, as well as a review of the Proponent's impact assessment conclusions and proposed adaptive management plans for caribou and caribou habitat.
- Environment Canada: Information from Canadian Ice Services, including changes to ice regime specific to the Nunavut Settlement Area that may affect project-related shipping, including specifically the timing of freeze-up in Bathurst Inlet and observed or anticipated changes to ice formation in this and other areas relevant to the shipping route(s) as proposed for the Project.
- Aboriginal Affairs and Northern Development Canada: Adequacy of proposed security and reclamation estimates provided by the Proponent within its FEIS.
- Aboriginal Affairs and Northern Development Canada and Natural Resources Canada: Structure and suitability of the engineering and design of structures associated with the proposed tailings impoundment area, with emphasis on any considerations described in the FEIS for permafrost and climate change as well as contingencies for possible structural failure.
- Transport Canada and Canadian Coast Guard: Navigability of proposed shipping routes, particularly Bathurst Inlet, for the proposed vessel types, timing of shipping and specific approaches described by the Proponent.

[49] NIRB Pre-hearing Conference Decision for the Back River Gold Mine, NIRB File No. 12MN036, December 19, 2014.

When the Minister of Indigenous and Northern Affairs Canada (INAC) referred the assessment back to the Board for further consideration in January 2017, supplementary information on the following was requested by the Board:

- Issues where the Board noted a lack of clear evidence or assurance in proposed mitigation measures in the 2016 Final Hearing Report, specifically the potential for effects on:
    - caribou and terrestrial wildlife;
    - freshwater aquatic environment;
    - marine environment;
    - water quality (ground and surface); and
    - climate and meteorology;
- Highlights regarding whether the updated information has changed the characterization of the impact or the associated determination of residual, significant, or cumulative effects from the original FEIS; and
- A discussion of whether these updates to the assessment of ecosystemic effects for the Project have also resulted in corresponding updates to the socio-economic effects assessment for the Project.

This additional information provided the basis for the FEIS Addendum, the technical review submissions of the interveners and was the focus of the Board's supplemental Final Hearing in 2017.

1.9 PROCEDURAL ISSUES AT THE SUPPLEMENTAL FINAL HEARING

1.9.1 The Board's Decision-making Panel

Unfortunately, due to the unexpected unavailability of two of the Board's Members, including the Board's Chairperson on May 30, 2017, the evening before the supplemental Final Hearing, the Board would not have had the five members required to establish quorum to sit as a full Board at the supplemental Final Hearing. As the Board does have the authority under the *Nunavut Agreement*[50] and *the Nunavut Planning and Project Assessment Act*,[51] to delegate the conduct of the supplemental Final Hearing to a smaller Panel of the Board, five members of the Board held a special Board meeting by teleconference on the morning of May 31, 2017 to address this situation. During the special Board meeting, by Motion #20170602-05-SPM-02, the Board Members delegated the responsibility for conducting the supplemental Final Hearing and decision-making for the Back River Project to a three-person panel. The Back River Project Proposal Panel (the Panel) established by the Board consists of the Board's Vice Chairperson, Phillip (Omingmakyok) Kadlun acting as the Chairperson for the Panel, with Allen Maghagak constituting the Panel Member nominated by a Designated Inuit Organization and Kaviq Kaluraq constituting the Panel Member appointed by a territorial Minister. These Panel Members were all in attendance at the 2016 Final Hearing and participated in the full Board's deliberations and decision-making for the Back River Gold Mine Project in 2016.

Prior to the commencement of the supplemental Final Hearing on May 31, 2017, the Board notified parties regarding the delegation of the conduct of the supplemental Final Hearing to a Panel, the

[50] Article 12, Section 12.2.14.
[51] S.C. 2013, c. 14, s. 2 at s. 27.

designation of Mr. Kadlun as Panel Chairperson and specifying the composition of the Panel. There were no objections raised by any parties to the Board's Panel delegations and the supplemental Final Hearing proceeded on this basis.

To ensure that the Board had a contingency in place if a Panel Member should become unable to act, Board Member Guy Alikut attended the supplemental Final Hearing as an alternate Panel Member. As an alternate Panel Member, Mr. Alikut would only be required to engage in decision-making if one of the Panel Members became unable to discharge the duties delegated to them by the Board. Panel Chairperson Kadlun and Panel Members Maghagak and Kaluraq were able to complete their decision-making duties for the file and therefore Board Member Alikut was not required to engage as a decision-maker for the file.

1.9.2 The Disposition of Motions at the Supplemental Final Hearing

On May 25, 2017 the Board received a Motion from Sabina Gold & Silver Corp. and the Affidavit of Bruce McLeod,[52] in support of the Motion. The Motion requested that the Proponent be permitted to file two letters regarding financing for the Project on a confidential basis as provided for under Part 13 of the Board's Rules of Procedure.[53] On May 26, 2017 the Board posted Sabina's Motion and Affidavit on the NIRB's public registry and indicated to all parties that the Motion would be heard during the supplemental Final Hearing. On June 2, 2017, the Motion was heard by the Panel, and the Proponent and interveners were provided with an opportunity to make oral submissions in respect of Sabina's request for confidentiality. No parties objected to the Motion.[54]

By Motion #20170602-04-SPM-02, the Panel decided to grant the Motion for confidentiality as requested by Sabina. In coming to this conclusion, the Panel considered the Motion, Affidavit in support, Parts 7 and 13 of the Board's Rules of Procedure and the oral submissions of the parties who spoke to the Motion at the supplemental Final Hearing. The Panel determined that, as set out in Rule 13.3 of the Board's Rules of Procedure,[55] if the two documents were to be posted on the public registry the harm that would result to Sabina would outweigh the public interest in having this documentation publicly available.

As was explained to the parties at the supplemental Final Hearing, the result of the Panel's grant of Sabina's Motion means that the two documents were received, reviewed and considered by the Panel only and that the documents will not subsequently be posted on the public registry or otherwise be made available to the public.

[52] Sworn on May 23, 2017.
[53] NIRB Rules of Procedure, September 3, 2009, Rule 13.2 at p. 11.
[54] NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 617-620.
[55] Rule 13.3 states:

> If the Board determines that the harm that would result if the document were placed on the public registry outweighs the public interest in the disclosure of the document, the Board may, after the hearing of the motion, grant a request for confidentiality on any terms that it considers appropriate.

2 PROJECT SETTING[56]

2.1 DESCRIPTION OF PROJECT LOCATION

Components of the Back River Gold Mine Project (Back River Project or the Project) are proposed to be located in the Kitikmeot region of Nunavut, approximately 400 kilometres (km) southwest of the community of Cambridge Bay and 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories (see Figure 1). The Kitikmeot is one of Nunavut's three administrative regions (along with the Kivalliq and the Qikiqtani regions).

The Kitikmeot region is comprised of two (2) seasonally inhabited communities – Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) - and five (5) year-round communities: Cambridge Bay (Ikaluktuuttiak), Kugluktuk, Gjoa Haven (Uqsuqtuuq), Taloyoak, and Kugaaruk. The population in the Kitikmeot region has grown rapidly over the past two (2) decades; all of the year-round communities except Kugluktuk have at least doubled in size between 1981 and 2011 and the entire region has experienced a growth rate of approximately 25% between 2001 and 2011.

As of 2011, approximately 91% of the Kitikmeot population identified as Aboriginal, of which 99% were Inuit. Using 2012 information from the Nunavut Bureau of Statistics, Sabina reported that the majority of residents in Taloyoak and Kugaaruk indicated that Inuktitut was their mother tongue, while the majority of residents in the eastern Kitikmeot communities, as well as Gjoa Haven, indicated that their mother tongue was English. Inuinnaqtun speakers predominantly reside in Kugluktuk and Cambridge Bay.

The formal economy in the Kitikmeot region is mixed and largely focused on public and private sector services and traditional activities. The formal economy includes government administration, health care and social services, education, construction, transportation, and mineral exploration and development. The service sector provides approximately 84% of employment in the region, while the primary and secondary industries, including construction and resource-based industries, constitute approximately 18%. Tourism is identified as an emerging industry and there is potential for economic opportunities in the Kitikmeot region to develop over the next 25 years in both renewable and non-renewable resource sectors. Nunavut imports almost three (3) times as much as it exports and regional economic development is constrained by a lack of skilled labour, lack of infrastructure, and difficulties with transportation to outside markets.

The project area is located within lands traditionally used by the Copper Inuit, and Sabina reported that 170 and 269 archaeological sites have been identified within the archaeological local and Regional Study Areas, respectively. Sites include, but are not limited to, campsites, resources gathering sites, and lithic workshops.

The Back River project area would be located near the northern boundary of the North American Continent, near the Arctic Circle, and experiences a climate characterized by low precipitation, high wind speeds, majority sub-zero temperatures, and high snow accumulation. Typical arctic seasonal daylight variations occur within the region, with near perpetual daylight summers and predominantly dark

[56] Unless otherwise stated, information in this section is based on the information provided by the Proponent in the Final Environmental Impact Statement (FEIS), received by the NIRB on November 23, 2016.

winters. Previous glaciations are predominantly responsible for the current physical topographic features and the Project would be located within the continuous permafrost region of western Nunavut. Due to permafrost and annual freeze and thaw cycles, soils have been poorly developed and have been classified as cryosolic. Sabina has identified 29 unique and overlapping ecosystems in the terrestrial Regional Study Area, 60% of which have been categorized into Bedrock-Sparse and Tundra-Heath classes.

The Project is located within the watershed boundaries of the Ellice River Watershed, Back River Watershed, and the Western River Watershed. The majority of project infrastructure at the proposed Goose Property would be located within the Ellice River Watershed, which flows into the Arctic Ocean via the west side of Bathurst Inlet, and north of the Back River Watershed, which flows into the Arctic Ocean south of Gjoa Haven. Surface water is predominantly in the form of small and shallow ponds and lakes, which are connected by small streams and rivers. The proposed Marine Laydown Area would be located along the western shore of the south side of Bathurst Inlet. Bathurst Inlet is generally very deep, with the entrance located between Cape Barrow and Cape Flinders, and extends over 200 km southwest into the mainland and past the Arctic Circle.

2.1.1 Biophysical Conditions

Average annual air temperatures recorded at the Goose Property between 2004 and 2013 ranged from -11.5°C to -6.6°C, with average monthly temperatures of -33.0°C to 14.5°C and daily average extremes of -45.5°C to 29.8°C. Measurements of recent total annual precipitation levels ranged from 112 millimetres per year (mm/year) to a high of 344 mm/year. Wind speeds are generally high, above three (3) metres per second (m/s), due to the absence of obstructions that could impede wind (e.g., trees and mountains) in the project area. Wind direction predominantly originates from the northwesterly quadrant and can reach speeds in excess of 11 m/s. Air quality, noise, and vibration levels are considered to be pristine, characteristics commonly associated with remote and relatively undisturbed areas within the region.

The area is dominated by rolling landscapes with gradual slope gradients that rarely exceed seven percent (7%), and elevations that range between 300 and 700 metres (m) above sea level. Upland areas are typically covered by morainal materials, which comprise 51% of the project area, while mineral soils (predominantly acidic) are most commonly found overlaying bedrock in plains or in gently sloping ranges with average soil depths of 4.8 m to 10.6 m. Except for naturally-occurring arsenic exceedance at select locations within the project area, soil metal concentrations generally do not exceed Canadian Council of Ministers of the Environment (CCME) guidelines. Distinct landforms commonly found in the area include eskers, morainal rocky ridges, and boulder fields.

The proposed project area is located within the continuous permafrost region of western Nunavut and soil-related thermokarst phenomena such as hummocks, hollows, and frost boils are common. The average maximum depth of the seasonal active layer measures approximately two (2) m and, outside of soil beneath select surface waterbodies, subsurface temperatures remain below 0°C year-round. Through taliks, unfrozen soil open to waters above and unfrozen layers below waterbodies, that connect to deep groundwater systems are assumed to be present beneath waterbodies with widths greater than 200 m and depths exceeding 1.3 m.

The project area is dominated by tundra vegetation that includes dwarf woody shrub species, herbs, graminoids, mosses, and lichens. Areas of vegetation are contrasted by barren regions of morainal

material, exposed bedrock, windswept esker crests, marine beaches, and other sites that limit vegetation growth.

Peak flow of streams within the Ellice River, Back River, and the Western River watersheds generally occurs twice throughout the spring and summer – during freshet and again during late summer rains. Due to the presence of permafrost, smaller basins do not interact with groundwater and tend to cease discharging after freshet until late-summer precipitation. Seasonal freeze-up generally occurs between late October and early November.

Water in lakes within the area have slightly acidic to neutral pH levels and generally low metal concentrations, with the exception of cadmium and copper. Naturally elevated concentrations of these metals can occur near or slightly above CCME guidelines, likely resulting from the presence of metal-bearing minerals in watershed streams. Several lakes and streams within the area have copper and arsenic sediment concentrations naturally above CCME sediment quality guidelines.

The most widely distributed fish species found in lakes in the project area are Lake Trout and Arctic Grayling. Round Whitefish, Lake Cisco, Longnose Sucker, Ninespine Stickleback, and Lake Whitefish have also been observed in lakes within the area, while Arctic Grayling, Slimy Sculpin, and Burbot species have been found in stream systems. Although smaller lakes and streams, less than 2 m, freeze completely during winter months, larger lakes such as Propeller, Goose, and Big lakes maintain stream flow and sufficient oxygenated water levels to sustain year-round habitats for fish species. No fish species discovered within the area are considered endangered, threatened, or listed under the *Species at Risk Act*.

The Project is located within the range of the barren-ground Bathurst, Ahiak, and Dolphin, and Union caribou herds. Satellite collar tracking, aerial surveys, motion-triggered cameras, and habitat mapping have shown that the herds interact with the project area throughout different times of the year. The Bathurst caribou herd uses the project area as a spring migration corridor to calving grounds located approximately 100 km northwest of the Project, as well as a post-calving area during mid-summer months. The Ahiak herd interacts with the project area mostly during summer and fall months, with calving grounds located approximately 250 km northeast of the project area. Studies have indicated that the Dolphin and Union herd is likely to interact with the project area only during winter months throughout its seasonal migration to and from Victoria Island, and potentially in low densities north of the project area over winter. Muskoxen occupy the project area and the region year-round.

Large and small predatory species, such as grizzly bear, wolf, wolverine, and fox are known to consistently occupy and den in the Kitikmeot region. Small mammals, such as ground squirrels and Arctic hare, commonly occur throughout the project area.

Waterbirds, upland breeding birds, and raptors migrate north seasonally to nest and breed in the region during the short summers. Of the 45 different waterbird and upland breeding bird species that have been observed throughout the region; Lapland longspur, savannah sparrow and Canada Goose are the most common. Three waterbird species and ten upland breeding bird species present throughout the area are species of conservation concern and are considered sensitive in Nunavut. All nine (9) raptor species known to inhabit the Kitikmeot region have been identified within the project area, including all five (5) raptor species of conservation concern within the territory (i.e., golden eagle, gyrfalcon, rough-legged hawk, peregrine falcon, and short-eared owl). The gyrfalcon, snowy owl, and common raven are the only bird species known to overwinter within the project area.

Marine mammals occurring within the project area include the ringed and bearded seal. Although different whale species are found along shipping routes in the Northwest Passage, they do not do not regularly occur within the Project's marine area. The composition of the marine fish community in Bathurst Inlet reflects the presence of a low-saline environment, and the Fourhorn Sculpin, Capelin, Pacific Herring, and Starry Flounder are considered some of the most common fish species within the marine region. Arctic Char are known to travel inland to spawn in rivers and streams connecting to the ocean and are also known to overwinter in lakes within the region.

2.1.2 Socio-economic Conditions

As of 2011, the population of the Kitikmeot region was approximately 6,012, with the sizes of the five (5) year-round communities ranging from 771 residents in Kugaaruk to 1,608 residents in Cambridge Bay; 29 to 42% of the population in each community is 15 years of age and younger. Between 1981 and 2011, the largest population increases in the Kitikmeot region took place in Kugaaruk and Gjoa Haven. Birth rates and net in-migration from other areas in Canada are the main factors contributing to the levels of population growth in the Kitikmeot region and Nunavut as a whole. There is no secondary statistical data available for Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo).

While Cambridge Bay has the highest level of formal education attainment levels compared to the other communities in the Kitikmeot region, the proportion of the population aged 25-64 in all of the communities that do not have a high school level of education, certificates, or diplomas, is significantly higher than the national average of 13%. Unexplained absences, also called truancy rates, have increased in all Kitikmeot communities between the school years of 2001/2002 and 2010/2011.

In 2011, the potential labour force of the five (5) year-round communities of the region was approximately 3,925 individuals; the average participation rate was 61%, which was reported as slightly lower than identified in 2006 and lower than the average participation rate in Nunavut and Canada. The reported unemployment rate in the Kitikmeot region was 25% in 2011, which was higher than the Baffin and Kivalliq regions, with 15 and 20% unemployment rates, respectively. Although unemployment in the Kitikmeot region is slightly higher among the Aboriginal population, Inuit are experiencing increasing engagement in the wage economy. Although it was reported that in 2010 Cambridge Bay has a substantially higher median individual income than the territorial average, the other Kitikmeot communities were below the Nunavut average.

The traditional economy, which includes non-commercial hunting, fishing, trapping, gathering, and arts and crafts, in the Kitikmeot region is largely comprised of subsistence land use and Inuit participation in the traditional economy is often supported by wage employment through the formal economy. Sabina noted that the timing and consistency of Inuit participation in the market economy is influenced by the availability of wage employment and the seasonality of subsistence harvesting. Traditional subsistence harvesting activities are important to the livelihoods of many Inuit in the Kitikmeot region, and Nunavut as a whole, and are used to support and facilitate the transmission of Inuit culture as well as traditional forms of social relationships and networks among Inuit.

While there are a range of health services and programs available within the five (5) full-time Kitikmeot communities, the general health status of residents in the region is considered below that of the general Canadian population. The region has experienced relatively high rates of suicide, which Sabina noted has been attributed to recent rapid social change that has resulted in a loss of self-reliance and a sense

of discontinuity. Sabina noted that general community wellbeing, as described by Indigenous and Northern Affairs Canada's community wellbeing indicator, was relatively low in the Kitikmeot communities. Sabina further identified crime and availability of housing as contributing to community health and wellbeing and noted that crime rates were highest in Cambridge Bay, Kugluktuk, and Gjoa Haven. Overcrowding was reported as highest in Gjoa Haven, Taloyoak, and Kugaaruk, and dependence on publically available housing was high in all communities.

2.2 PROJECT DESCRIPTION

The Back River Gold Mine Project (Back River Project or the Project) is a proposed gold mining and milling operation, located in the Kitikmeot region of Nunavut approximately 400 kilometres (km) southwest of the community of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories.

The Back River Project collectively refers to the proposed Goose Property and a proposed Marine Laydown Area (MLA) at Bathurst Inlet. Mine supplies would be annually transported by barge to the MLA, and then by winter ice road to the Goose Property from mid-January to April. The four (4) mineral deposits at the Goose Property – Umwelt, Llama, Echo, and Goose Main – would be mined using both open and underground methods. Total minable mineral reserves for the Back River Project are estimated at approximately 19,792 thousand tonnes at 5.70 grams per tonne for a quality of contained gold of 3,628 thousand ounces. All of the extracted ore would be processed locally through a constructed mill facility at the Goose Property. A tailings storage facility would be used for tailings deposition for the first two (2) years of production, followed by direct tailings deposition into the mined out Umwelt and Goose Main pits. The gold doré bars would be transported south by aircraft.

2.2.1 Need for the Project

Sabina described the Back River Project in Volume 2 of its FEIS as a development that would:

- Realize a return on investment by the owner – The capital cost of the Project is currently estimated at $695 million. The Project would provide a return on investment to the company's shareholders and supply gold to the international marketplace.
- Support the Nunavut Planning Commission's broad planning principles, policies, and goals.
- Contribute to healthy communities and strengthen stakeholder and institutional partnerships – The Back River Project would benefit communities through development of infrastructure, skills training, employment, and business opportunities.
- Contribute to Canada's northern strategy to strengthen Canada's sovereignty – The Project would protect the country's environmental heritage, promote economic and social development, and improve Northern governance.
- Provide overall net benefit of the Project to sustainable development in Nunavut.

2.2.2 Project Components

The proposed major project components and activities, as described by Sabina in its FEIS, include:

- *Access* – Sabina is proposing to construct a 160 km long winter ice road from the MLA at Bathurst Inlet to the Goose Property. Sabina estimated that 42% of the winter ice road would be constructed over land 58% would be constructed over water.
- *Airstrip and Marine Laydown Area* – The project proposal includes upgrading the current exploration/development gravel airstrip to an all-weather airstrip and apron capable of servicing large passenger and cargo aircraft. A marine laydown area would be constructed at Bathurst Inlet to receive equipment, material, fuel, and supplies required for the operation of the Project. Sabina noted that an airstrip capable of accepting small turboprop aircraft could be constructed on ice during the winter months near the MLA.
- *Mineral claims* – The Project is composed of 45 federal mineral leases and 19 federal mining claims covering approximately 54,042 hectares.
- *Mining methods* – The Project would use both open pit and underground mining methods and mining and milling would take place 24 hours a day, year-round. The net mine production rate is estimated to be approximately 350,000 ounces of gold per year, for 10 years.

The mining areas, as outlined in the FEIS, include:

- *Goose Property* – Four (4) known deposits (Umwelt, Llama, Echo, and Goose Main) to be mined and trucked using conventional open pit and underground methods. Ore produced from the deposits to be processed using standard gravity and leach recovery processes at a process plant on-site.

2.2.3 Project Phases

Construction

The mobilization and on-site construction activities would be expected to take four (4) years to complete. Key construction activities as outlined in the FEIS include:

- Marine Laydown Area:
  - Site roads, quarry sites, and borrow area;
  - Fuel storage, laydown, and storage area;
  - Water supply;
  - Power generation;
  - Lighter barge terminal;
  - Airstrip; and
  - Waste management, wastewater treatment, and sewage treatment.
- Winter ice roads connecting the:
  - MLA and the Goose Property; and
  - George exploration camp to a junction on the proposed winter ice road.
- Goose Property:
  - Site roads, airstrip, and associated navigation equipment;
  - Fuel tank farm and laydown area including heated, unheated, and outdoor storage;
  - Explosives storage;
  - Ore stockpile and waste rock storage areas;
  - Process plant, maintenance, and service buildings;
  - Tailings Storage Facility;

- Administrative buildings and Goose camp;
- Waste management facilities; and
- Powerhouse and emergency powerhouse.

Sabina noted that the footprint of the above facilities could shift within the Potential Development Area (PDA) associated with each area (marine laydown area, winter ice road, and the Goose Property) as further geotechnical investigations are undertaken and the designs of the facilities are finalized. For the purpose of the environmental effects assessment as it relates to landforms, vegetation, and wildlife, and excepting freshwater aspects, Sabina assumed that the entire area of the PDAs would be lost for the duration of the mine life.

Operations

Based on mineral reserves currently identified, the operational life for the mine is estimated at 10 years. Sabina has noted, however, that should ongoing exploration lead to further discoveries, the life of Project could be extended to allow for extraction and processing of the additional resources.

Proposed mine activities are centered on open pit and underground mining methods for four (4) mineral deposits at the Goose Property: Umwelt, Llama, Echo, and Goose Main. The mining plan has been integrated with the Tailings Management Plan, utilizing the Tailings Storage Facility (TSF) for the first two (2) years, then shifting to sequential deposition into two (2) open pits.

Sabina proposed and designed a mine rock management plan to avoid potential interaction between mine rock and natural waterbodies, maximize the use of mine workings for long-term management, maximize the use of mine rock as construction material, and ensure the long-term protection of the Project's physical and socio-economic environment.

Ore mined at the Goose Property would be hauled to ore stockpiles located at the Goose Plant Site. Ore would be sorted on a pad northwest of the process plant based on ore grade and placed into one (1) of three (3) stockpiles: low-grade, medium-grade, or high-grade. Key processes included within the mill proposal designed to recover the gold from the mined ore include: crushing and grinding; concentrating and subsequent leaching; and lastly a carbon-in-pulp recovery of the gold. The leach circuit would then continue with carbon elution and electrowinning; smelting would then be undertaken to produce gold doré bars. The total milling feed for the processing plan is estimated at 6,000 tonnes of ore per day.

Sabina designed a Tailings Management Plan to prevent potential interaction between mine tailings and natural waterbodies, maximize the mine works for long-term management of tailings, and to ensure long-term environmental protection of the site and surrounding areas. Underflow from the tailings thickener would be pumped to a cyanide detoxification circuit where the residual cyanide would be decomposed by a sulphur dioxide (SO_2)/air oxidation process. Tailings would be deposited for the first two (2) years of operation into the TSF, followed by four (4) years of deposition into the mined-out Umwelt open pit, and lastly into the mined-out Goose Main open pit for the remaining four (4) years of the mine life. The TSF would also be used for temporary contact water storage after tailings deposition shifts from the TSF to the mined-out Umwelt open pit. The tailings in the TSF would be covered with non-potentially acid-generating waste rock of at least five (5) metre (m) thickness. Finally, both open pit tailings facilities would be filled with a minimum of five (5) m of permanent water cover.

Sabina developed a water management strategy with the primary objectives of minimizing the intake of freshwater and the release of treated effluents into the local environment; all water in contact with

mine activities would be intercepted, contained, analyzed, and treated. Further, any water released to the environment would meet the *Metal Mining Effluent Regulations*, as well as site-specific criteria defined during the licensing processes for the Project.

The majority of supplies and equipment required for project operations would be shipped via marine transport during the open water season. Shipments would arrive annually at the MLA's lightering barge terminal, and then continue to the mine site by winter ice road from mid-January to April. Approximately 60 million litres (ML) of fuel would be transported annually during the peak consumption years, along with up to 30,000 tonnes of dry goods. Sabina estimated that 67 to 507 thousand ounces of gold doré bars would be transported out of the mine site via air annually.

Closure

The preliminary Mine Closure and Reclamation Plan includes the removal and stabilization of all structures and the reclamation of disturbed areas such that the environment would be considered safe for human and non-human use, long-term adverse effects would be minimized, the reclaimed landscape would be stable and self-sustaining, and restrictions on future land use would be minimized. A financial security would be required as a condition of approval by regulatory agencies to ensure that reclamation activities would be financially supported regardless of mine development. The projected schedule for closure beyond the operations phase would include eight (8) years of reclamation and closure activities, plus an additional five (5) years of post-closure monitoring.

Within the preliminary Mine Closure and Reclamation Plan, closure of the open pits would include the placement of boulder fences around each opening and then flooding with lake water. Underground void spaces, with the exception of the Echo underground mine, would be flooded with saline groundwater from the Saline Water Pond at the cessation of mining. The mine portal openings would be sealed with a non-potentially acid-generating (NPAG) waste rock plug approximately twice as long as the width of the openings. Waste rock storage areas would be covered with five (5) m caps of NPAG material to promote the aggregation of permafrost and to encapsulate potentially acid-generating material. A landfill would be established within the waste rock storage areas at the Goose Property which would receive all inert materials not being transported off-site. Water management structures would be decommissioned throughout the mine life when no longer needed.

Post-Closure Monitoring

Post-closure monitoring for the Project is projected to last for five (5) years. However, post-closure monitoring would carry on until closure objectives have been achieved. A monitoring program would be implemented upon completion of closure activities to monitor environmental parameters to ensure conformity with licensing requirements, to verify success of closure activities, demonstrate compliance with regulatory requirements and objectives, and to quantify any residual environmental effects.

3 INVOLVEMENT OF INTERESTED PARTIES

3.1 ENGAGEMENT OPPORTUNITIES

3.1.1 Public Consultation

Public participation is a central objective of the NIRB's assessment process. Meaningful public participation within the Review process requires that the assessment process address concerns of the general public regarding the anticipated or potential environmental effects of the Back River Gold Mine Project (Back River Project or the Project) proposal. The NIRB's Review process must also involve potentially affected Nunavummiut (defined as the people inhabiting the territory of Nunavut) to address concerns regarding any changes that the Back River 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 Board's public consultation process throughout the review of the Project included community consultations. For this assessment, the NIRB held public information meetings in each of the five (5) year-round communities of the Kitikmeot region of Nunavut: Kugluktuk, Cambridge Bay, Gjoa Haven, Kugaaruk, and Taloyoak. Special invitations were extended to residents of the seasonally inhabited communities of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) to ensure they were aware of the consultations and given particular opportunities to participate. Public meetings were further held in Yellowknife, Northwest Territories to encourage participation by parties who could be potentially affected by transboundary impacts within the Northwest Territories.

Both the 2016 Final Hearing and the supplemental Final Hearing were held in Cambridge Bay, Nunavut, the nearest community to the proposed Project. The Board sat extended hours so that members of the public might have the most opportunity to attend and ask questions during the day or evening to accommodate their work schedules. Elders and other community members who were present at both the 2016 Final Hearing and supplemental Final Hearing were encouraged to make statements, ask questions, and identify their concerns with the project proposal. The NIRB further supported public participation by enabling the five (5) year-round and the two (2) seasonally inhabited communities of the Kitikmeot region of Nunavut to each select and send up to five (5) representatives to attend the whole of the 2016 Final Hearing and supplemental Final Hearing, ask questions, and make submissions. The NIRB additionally invited representatives of the City of Yellowknife, Community Government of Behchokǫ̀, Community Government of Gametì, Community Government of Wekweètì, Community Government of Whatì, Łutsel K'e Dene Band, North Slave Métis Alliance, and the Yellowknives Dene First Nation (N'dilo and Dettah).

Attendance at any of the NIRB's public meetings associated with this proposed Project, including the supplemental Final Hearing, was tracked via the sign-in sheets associated with these meetings. It is the NIRB's practice to ask all participants to sign in at the beginning of each session (morning, afternoon, and evening) of proceedings; a full listing of sign-in sheets from both hearings is available online from the NIRB's public registry at www.nirb.ca by using any of the following search criteria:

- Project Name: Back River Project
- NIRB File No.: 12MN036
- Application No.: 124149

The consultation efforts and opportunities for Nunavummiut and residents of Canada to provide their comments to the NIRB during the Review process are outlined in Table 1.

The Proponent was also required to document its efforts regarding consultation to ensure that Nunavummiut had the information they required regarding the Back River Project Proposal and its potential impacts. Sabina Gold & Silver Corp. (Sabina) has undertaken on-going public consultation engagement since 2012, integrating information gathered into its environmental effects assessment reports. Sabina's specific consultation efforts are summarized in Volume 3 of the FEIS and the FEIS Addendum.

Sabina hired a Community Liaison Officer and opened an office in Cambridge Bay in 2012 to further facilitate dialogue between the community of Cambridge Bay and the company. The office space was described as providing a work space, meeting facility, communication technologies, storage, and location for community members to access the Community Liaison Officer and project-related information. Sabina's public consultation and engagement program utilized various community engagement methods and tools, including, but not limited to: public meetings, stakeholder meetings, workshops with local Elders and knowledge holders, meetings with community advisory groups in Cambridge Bay and Kugluktuk, site visits, distribution of newsletters and other materials, community donations, and the use of social media (e.g., websites, Twitter, email, rich site summary feed (RSS feeds), Facebook, etc.) as well as radio shows. Sabina further undertook a traditional knowledge study in partnership with the Kitikmeot Inuit Association and Kugluktuk Hunters and Trappers Organization. Sabina has further established a public consultation database incorporating meeting minutes from multiple formal and informal meetings with project stakeholders. Within the FEIS, the database was noted to contain approximately 165 topic directories and was used to identify key issues and concerns amongst communities and stakeholders; the resulting issues and concerns were categorized under three (3) main themes: community benefits and engagement, employment and training, and environmental management and monitoring.

Sabina noted that it had undertaken approximately 250 project-related community and stakeholder meetings for the Project, including 64 meetings since the 2016 Final Hearing, held in April, 2016. It was further clarified that the public meetings following the 2016 Final Hearing were primarily held in Cambridge Bay and Kugluktuk, with meetings also taking place in the Nunavut communities of Taloyoak, Kugaaruk, and Gjoa Haven as well as Yellowknife, Northwest Territories. In 2016, Sabina formally commenced its negotiations with the Kitikmeot Inuit Association on land tenure and terms of an Inuit Impact Benefit Agreement for the Project.

In addition to the consultation activities of the NIRB and the Proponent, increasingly over the past decade and with better public access to the internet and Northern-based media outlets, the media has assumed an important role in support of the NIRB's goals of enhanced public awareness and participation. Media outlets have assisted by providing notice of meetings and hearings, disseminating information and reporting on the supplemental Final Hearing.

3.2 THE PARTICIPANTS

3.2.1 Kitikmeot Inuit Association

The Kitikmeot Inuit Association (KIA) is a Designated Inuit Organization under the *Agreement between*

the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada (*Nunavut Agreement*), representing the interests, rights, and values of Inuit in the Kitikmeot region at the territorial and regional levels. The KIA supports sustainable economic development opportunities for Inuit beneficiaries. As a Designated Inuit Organization, the KIA is mandated to oversee Inuit Owned Land management issues within the Kitikmeot Region. Through its Lands Department, the KIA administers the use of Inuit-owned surface lands, including those associated with the Back River Project, in order to meet legal obligations respecting surface land management. The KIA negotiates Inuit Impact and Benefit Agreements in accordance with Article 26 of the *Nunavut Agreement*. The KIA participated actively in the NIRB Review and supplemental Review processes and brought forth several technical issues during various stages of the NIRB's assessment. The KIA participated at both the 2016 Final Hearing and the supplemental Final Hearing.

3.2.2 Government of Nunavut

The Government of Nunavut (GN) has 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. The GN reviewed both the FEIS and the FEIS Addendum and considered the following throughout the reviews:

- The requirements and principles (including the principles of conservation) in keeping with the spirit and intent of the *Nunavut Agreement*;
- The requirements of the laws and regulations of Nunavut;
- The priorities of the Government of Nunavut and Nunavummiut; and
- The NIRB's guiding principles – the "Precautionary Principle" in particular.

The GN was involved throughout the NIRB Review and supplemental Review processes and participated at both the 2016 Final Hearing and the supplemental Final Hearing.

3.2.3 Environment and Climate Change Canada

Environment and Climate Change Canada (ECCC) is responsible for leading the implementation of the Government of Canada's environmental agenda and is committed to contributing to the realization of sustainable development in Canada's North. ECCC'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 ECCC's mandate to conserve and enhance the quality of the natural environment, the Department administers subsection 36(3) of the *Fisheries Act,* which prohibits the deposit of a deleterious substance into fish-bearing waters. ECCC also administers the permitting of disposal at sea and participates in the regulation of toxic chemicals pursuant to the pollution provisions of the *Fisheries Act,* and the development and implementation of environmental quality guidelines pursuant to the *Canadian Environmental Protection Act*, 1999. ECCC is responsible for protecting and conserving migratory bird populations and individuals under the *Migratory Birds Convention Act,* 1994, and administers the *Species at Risk Act* in cooperation with Fisheries and Oceans Canada and the Parks Canada Agency.

ECCC participated actively in all phases of the NIRB Review and supplemental Review processes and participated at both the 2016 Final Hearing and the supplemental Final Hearing.

3.2.4 Fisheries and Oceans Canada

Fisheries and Oceans Canada (DFO) is the federal department that exercises authority over sea, coastal, and inland fisheries within Canada's territorial boundaries. Under the *Fisheries Act*, DFO is responsible for the management, protection, and conservation of fish (which include marine mammals as defined by the *Fisheries Act*) and their habitats. The mandate of the Fisheries Protection Program of DFO is to maintain the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries. Subsection 35 (1) of the fisheries protection provisions of the *Fisheries Act* states that "No person shall carry on any work, undertaking or activity that results in *serious harm to fish* that are part of a commercial, recreational, or Aboriginal fishery or to fish that support such a fishery". However, under paragraph 35(2)(b) of the Fisheries Act, the Minister of Fisheries and Oceans may issue an authorization with terms and conditions in relation to a proposed work, undertaking or activity that may result in *serious harm to fish*.

The *Species at Risk Act* is intended to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from being extirpated or becoming extinct; to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and to manage species of special concern to prevent them from becoming endangered or threatened. The Minister of Fisheries and Oceans is the competent minister for listed aquatic species that are fish (as defined in section 2 of the *Fisheries Act*) or marine plants (as defined in section 47 of the *Fisheries Act*).

The purpose of the technical review undertaken by DFO of the FEIS and FEIS Addendum was to ensure that works, undertakings, and activities proposed in and around fisheries waters are conducted in such a way that the Proponent would be in compliance with the applicable provisions of the *Fisheries Act*. DFO categorized its comments on the FEIS Addendum into Freshwater Environment, Marine Environment, Conceptual Fish-Out Plan, and Conceptual Offsetting Plan.

DFO was involved throughout the NIRB Review and supplemental Review processes and participated at both the 2016 Final Hearing and the supplemental Final Hearing.

3.2.5 Health Canada

Health Canada (HC) is responsible for maintaining and improving the health of Canadians. HC has no regulations or permits related to the Project but the department has provided the Board with technical advice relevant to HC's mandate for the NIRB's environmental assessment of this project. HC's review of the FEIS was limited to Volume 8, Section 6: Human Health and Environmental Risk Assessment. HC provided feedback with regards to the Proponent's assessment of country foods, noise, and potential health effects from proposed blasting activities. While HC submitted a final written submission for the Final Hearing, it had no comments on the FEIS Addendum and no additional comments beyond what had been provided in its original submission. HC did not attend the 2016 Final Hearing or the supplemental Final Hearing in Cambridge Bay.

3.2.6 Indigenous and Northern Affairs Canada

Indigenous and Northern Affairs Canada (INAC) 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. In Nunavut, INAC has responsibilities for land and water resource management. In the NIRB Review process, INAC provided

technical advice relative to its mandate and made recommendations to the NIRB to assist with the review and supplemental review of the Back River Project.

INAC's Minister, in concurrence with other responsible Ministers, will have a decision-making role in response to the Board's reconsideration. If the proposed project is approved to proceed, INAC will be responsible for inspecting and enforcing conditions contained within any Crown land authorization and water license associated with the Back River Project.

INAC was involved throughout the NIRB Review and supplemental Review processes and participated at both the 2016 Final Hearing and the supplemental Final Hearing.

3.2.7 Natural Resources Canada

Natural Resources Canada (NRCan) regulates the manufacturing and storage of explosives through the federal *Explosives Act*. 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. NRCan engaged experts within the Earth Science Sector's Geological Survey of Canada to provide advice on the FEIS related to surficial geology, permafrost and terrain sensitivity and stability, and hydrogeology. NRCan participated throughout the Review and supplemental Review processes of the Project and participated at both the 2016 Final Hearing and the supplemental Final Hearing.

3.2.8 Transport Canada

Transport Canada (TC) is responsible for the development and administration of transportation policies and programs for Canada. TC also has a responsibility to regulate associated transportation infrastructure, equipment, and personnel in accordance with key relevant pieces of legislation, including the *Navigation Protection Act*, *Aeronautics Act*, *Canada Shipping Act, 2001*, *Arctic Waters Pollution Prevention Act, Marine Liability Act, Marine Transportation Security Act*, and the *Transportation of Dangerous Goods Act*. TC provided advice associated with navigable waters, marine transportation safety and security, transportation of dangerous goods, and Aboriginal consultation. TC was involved throughout the NIRB Review and supplemental Review process and participated at both the 2016 Final Hearing and supplemental Final Hearing.

3.2.9 Burnside and Hunters and Trappers Organization

The Burnside Hunters and Trappers Organization (BHTO) represents the community of Kingaok (Bathurst Inlet). The BHTO has assigned powers and functions recognized through the *Nunavut Agreement* including the following:

- the regulation of harvesting practices and techniques among members, including the use of non-quota limitations;
- the allocation and enforcement of community basic needs levels and adjusted basic needs levels among members; and
- the assignment to non-members, with or without valuable consideration and conditions, of any

portion of community basic needs levels and adjusted basic needs levels.

The BHTO has representatives on the Kitikmeot Regional Wildlife Board and Nunavut Tunngavik Incorporated. The BHTO submitted final written submissions for both the 2016 Final Hearing and the supplemental Final Hearing, and had representation at both hearings.

3.2.10 Government of the Northwest Territories

The Government of the Northwest Territories (GNWT) is the primary authority for wildlife conservation and management in the Northwest Territories (NWT) and is responsible for working with other jurisdictions to ensure that transboundary wildlife populations harvested by NWT residents are managed to support their sustainable use by current and future generations. The GNWT has been an active participant in the NIRB's Review of the Back River Project and provided input with regards to potential cumulative effects on transboundary wildlife species, including caribou, grizzly bears, and wolverine. The focus of the GNWT review of the FEIS Addendum was on caribou and the Wildlife Mitigation and Monitoring Program Plan. The GNWT had in-person representation at 2016 Final Hearing and participated in the supplemental Final Hearing through teleconference.

3.2.11 Łutsel K'e Dene First Nation

The Łutsel K'e Dene First Nation (LKDFN) is centered on the Snowdrift Reserve in the Northwest Territories. The LKDFN participated as an Intervenor at the 2016 Final Hearing to speak to the importance of caribou and the potential for inter-jurisdictional effects upon caribou herds from the perspective of an Aboriginal user group, particularly associated with food security and cultural, social, linguistic, and spiritual continuity. The LKDFN further expressed its concerns related to the potential impacts of the Project on caribou herds and LKDFN members through in its final written submission on the FEIS Addendum for the supplemental Final Hearing. The LKDFN participated throughout the Review and the supplemental Review of the Back River Project, although it did not participate as an Intervenor during the supplemental Final Hearing.

3.2.12 North Slave Métis Alliance

The North Slave Métis Alliance (NSMA) represents the Aboriginal rights-bearing Métis of the Great Slave Lake area. The NSMA participated throughout the Review and supplemental Review of the Back River Project and participated as an Intervenor at both the 2016 Final Hearing and the supplemental Final Hearing, speaking to the importance of caribou and the potential for inter-jurisdictional effects upon caribou herds from the perspective of an Aboriginal user group as well as Aboriginal rights.

3.2.13 Yellowknives Dene First Nation

The Yellowknives Dene First Nation (YKDFN) is centred in the community of Dettah in the NWT and occupies the Chief Drive East Territory. The YKDFN intervened at the 2016 Final Hearing to speak to the importance of caribou and the potential for inter-jurisdictional effects upon caribou herds, particularly related to food security and culture, from the perspective of an Aboriginal user group. The YKDFN further expressed its concerns related to the potential impacts of the Project on caribou herds and YKDFN members in its final written submission on the FEIS Addendum for the supplemental Final Hearing. The YKFDN participated throughout Review process but did not attend the supplemental Final Hearing.

3.2.14 Local Community Representatives

For both the 2016 Final Hearing and the supplemental Final Hearing in May and June 2017, the NIRB invited five (5) Community Representatives from each of the seven (7) Kitikmeot communities identified as being potentially affected by the Project. Representatives from Cambridge Bay, Kugluktuk, Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), Gjoa Haven, Taloyoak and Kugaaruk attended both the 2016 Final Hearing and the supplemental Final Hearing held in Cambridge Bay. In addition, representatives from four (4) communities in the Northwest Territories, Behchokǫ̀, Dettah, Łutsel K'e, and Wekweètì also attended the 2016 Final Hearing and the supplemental Final Hearing. The NIRB sought the assistance of community organizations in these communities to identify and engage 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 to solicit participants for the Final Hearings.

Community Representatives attended both the technical sessions of the Final Hearing as well as participated in the community roundtable sessions. At the 2016 Final Hearing a total of 36 Community Representatives from the eleven communities participated in the community roundtable portion of the Final Hearing. At the supplemental Final Hearing a total of 41 Community Representatives attended the Final Hearing, including one representative from the North Slave Métis Alliance. The oral format of both Final Hearings allowed the Community Representatives to observe the technical presentations delivered by Sabina and Intervenors and the resulting discussions over the first few days of the proceedings, followed by community roundtable sessions. During the community roundtable sessions, Community Representatives from each community sat at the table with the Board to hear focused presentations by Sabina and Intervenors explaining Project components in detail. Community Representatives were then invited to pose questions to Sabina and Intervenors and to address comments to the NIRB Board. At the close of the community roundtable sessions, a designated representative from each of the communities was given the opportunity to summarize the comments, concerns and views of the community about the Project. These sessions were well attended and had all seats at the roundtable filled with Community Representatives. In addition, public members from Cambridge Bay attended the Final Hearings and were given the opportunity to express their views about the Project.

Specific reference to relevant comments, issues, and concerns expressed by Community Representatives at both Final Hearings in relation to particular effects are described in detail in sections 4, 5, and 6 of this Report, however, the two (2) tables that follow (Table 2 and Table 3) provide brief paraphrased summaries of the key issues, concerns and perspectives offered by Community Representatives and members of the public during the community roundtable sessions, grouped by topic. For a detailed understanding of the views expressed and information exchanged during the community roundtable component of the Final Hearings, parties are encouraged to consult the Final Hearing transcripts.[57]

[57] See the NIRB 2016 Final Hearing File No. 12MN036 Transcripts, April 28, 2016, pp. 781-969; April 29, 2016, pp. 985-1249; and April 30, 2016, pp. 1293-1354 and also see the NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 622-825; and June 3, 2017, pp. 845-1043.

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
ECOSYSTEMIC EFFECTS	
Air Quality	Concern expressed about how dust emissions from the roads, the mine site and the Marine Laydown Area can affect the air quality in the region.
Birds	Are there studies of the health of the migrating birds that find their way to the north?
Caribou	The speaker's grandfather said that there were thousands and thousands of caribou migrating in the Bathurst Inland area and during the migration it could be dangerous to be around the migration route. Concerns expressed that historically the area has witnessed caribou migration in the thousands in the area of the proposed mine and Marine Laydown Area, and could once again see these numbers.
	When the caribou were plentiful in that area not only were there thousands of caribou, but there were also hundreds of calves, so the area must have been a calving and post-calving ground at one time.
	Has the Proponent assessed the caribou populations on both the west and east side of Bathurst Inlet?
	Who else (in addition to the Proponent) is doing caribou studies in the area of the project (especially by helicopter)?
	Asked whether it would be better if the mine could be further away from where there are caribou and other wildlife.
	Asked whether the Proponent has consulted the historical data for caribou movement over the last 40-50 years, not just the last 20 years.
	Stated that in the 80s around Contwoyto Lake there used to be thousands of caribou, but they are gone from that area now.
	Noted that in the 1980s, outfitters took thousands of caribou and indicated some people are of the view that outfitters may have been responsible for some of the big declines in caribou numbers.
	Do the collars on radio-collared caribou hurt/make noise or otherwise bother the caribou?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Caribou (continued)	When there were tens of thousands, even up to a hundred thousand caribou in the Bathurst herd, there were calving grounds in the area of the mine; the Proponent needs to be prepared for the caribou to once again use the area in this way.
	From experiences in the Northwest Territories the local communities have seen that when mines are located on the caribou migration routes these routes have changed considerably (the caribou have moved around the mine sites).
	In the Northwest Territories the experience of many communities has been that the winter ice roads gave people the ability to go hunting on the road and take 20 or more caribou at a time; this could happen here (in Nunavut) when there are new winter ice roads added to the area.
	Management of the remaining caribou requires everyone to work together and support each other in an effort to jointly manage what we still have.
	How are the potential effects of the project on the caribou going to be monitored?
Caribou (continued)	Why are there 50 caribou collared—is this monitoring necessary for the mine or have they been collared as part of some other study or for some other purpose?
	Expressed concern that once caribou are gone people can't just go to the store and replace caribou in their diet, so people in the area will not support any activities or projects that could impact the caribou further.
	How will the Proponent adaptively manage the mine site if the Proponent identifies that the site is impacting caribou more than predicted?
	Some indicated that they would prefer to have cameras as the primary means of monitoring for caribou rather than collars, as there is concern that collars are affecting the health of the individual collared caribou.
	Indicated that personal experience with a collared caribou was very concerning; when a collared caribou was shot, the hunter found that the battery had burned into the fur around its neck (it was estimated that the collar had been on for three years and was designed to fall off eventually, but instead had burned into the fur of the caribou).

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Caribou (Continued)	Would the Government of Nunavut entertain an incentive (like the one in the Northwest Territories) for taking wolves in the winter and or taking wolves in the calving ranges of the caribou to reduce the wolf population in an effort to help the caribou population?
	When the collars drop off onto the sea ice and eventually drop into the water how are these collars recovered and what does the Government do to locate the animals that were collared after their collars drop off?
	How will the Proponent use the collar data to prevent impacts to caribou?
	Does the Government of the Northwest Territories think that the caribou are not mating and is that having a big impact on the caribou numbers?
	Is climate change having an effect on caribou numbers? What would those effects be?
	Does the Government of the Northwest Territories have information regarding the previous population cycles for the Bathurst herd—is this the lowest population measured?
Caribou (Continued)	Does the Government of the Northwest Territories believe that the Bathurst herd can rebound from its current state?
	Hunters know that in the area around the Ellis River, there are caribou from several herds that mix. Is there a way you can tell which herd (Ahiak, Bathurst, Beverly and Dolphin-Union) individual caribou are from?
	How heavy are the radio collars and how many caribou have died as a result of being collared?
	If the numbers of caribou rebound and the caribou will more consistently overlap the Proponent's site, would the Proponent suspend operations if caribou return in large numbers to the project area?
	Is more research going to be conducted with respect to the relationship between predators and caribou numbers; you must remember that an individual caribou cow has a single calf but a wolf has six pups.

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Caribou (continued)	When a radio collar drops off a caribou is it collected or left to deteriorate where it drops and if it is left in place could the collars do harm to the environment?
Chemicals	How will the Proponent get rid of the chemicals that the Proponent needs to use on-site and/or that become wastes—will they remain on-site, be put on the boat, driven out on the winter ice road, etc.?
Climate (including climate change)	Residents have noted that the snow is melting earlier in the spring and wonder whether this could be causing caribou to migrate earlier or not at all?
Dewatering	What are the regulations that apply to prevent the Proponent from mining too close to, in waterbodies or to address areas that are dewatered to allow for mining?
	When the Proponent dewaters Umwelt Lake where would the water and the fish from that Lake go?
	Can the Proponent describe how the fish out and dewatering of the lakes will be done?
Dust	What will the Proponent do to manage the dust coming from blasting?
	How will the Proponent manage airborne dust and minimize the effects on the environment and wildlife?
	How far out will the dust be dispersed onto the land and vegetation; and also what will be in the dust?
	How far away from the site will the Proponent be doing dust monitoring?
	Concern expressed that dust on the vegetation eaten by the caribou will change the meat quality and the taste.
Environmental Effects (General)	Concerns expressed that the mine will have permanent effects on all aspects of the environment and that this needs to be remembered. Once mining begins things are always different, there will be pits and dust in the air, wildlife and fish from around the mine will not taste the same.

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Environmental Effects (General) (continued)	The Proponent needs to be careful to prevent impacts so that the area and people around the area do not become afraid to eat the game, the fish and drink the water; people from the Northwest Territories don't want the people in Nunavut to be afraid to eat the food like they are now.
Explosives (Use)	Has the Proponent considered the potential for effects due to the use of explosives on birds and wildlife in the area?
	How will the Proponent make sure that the ammonium nitrate remaining after blasting doesn't contaminate the vegetation, land and water?
Fish	Concerns expressed about the potential for the ice roads to have impacts on the waterbodies that have very good fishing right now.
	Indicated that during the Fall time, the Ellis River was used for fishing with nets under the ice, but people have noticed that there are no fish there now; is the Proponent studying the water quality and fish in Goose Lake (the fish and water go into the Ellis River).
	Can KIA, DFO and the Proponent indicate their commitment to work together with the HTO to ensure that the offsetting project in Bernard Harbour can be undertaken this summer?
	Have there been any baseline studies conducted to establish what the health is of the fish in the area before the mine project begins?
Freshwater Quality	How are you going to make sure that operations are not impacting the water on the surface of the land?
	In the freshwater environment for the Goose property are you on the Ellis River system?
	It would be good to have some investigations as to the water quality in the area of the Goose property before the development begins.
Fuel Storage Tanks	The fuel storage tanks seem to be too close to the accommodations at the Goose property, how will you ensure safety on-site?
	In the area for refuelling aircraft, is that bermed/lined or otherwise contained?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Fuel Storage Tanks (continued)	Would be nice if the area surrounding storage tanks was double-bermed to be even more protective of the environment (reflecting how sensitive the Arctic environment is and especially how fuel going under the ice may not be seen for quite some time).
	How do you make sure that the berms around the fuel storage tanks will not leak (no cracking)?
Groundwater	Is the Proponent aware of the water sources that are under the ground that may be impacted by the mine and was the groundwater in the area surveyed?
Management Plans	Are the 29 Management Plans referenced in the Final Environmental Impact Statement available to the public?
Marine Laydown Area	In the Marine Laydown Area will there be a permanent road for moving the fuel that comes on barges; and when the Proponent transports the fuel to the mine site will there be any more permanent roads constructed?
	Will there be a proper dock at the Marine Laydown Area to withstand ice, wind and snow?
Marine Wildlife and Marine Habitat	It is difficult to see the breathing holes of the seals during the winter and it may be very difficult for you to avoid them.
	Seal pups are born in March and their dens are like igloos under the ice that could be easily disturbed if roads are built over the den sites.
	How would you ensure that seals (especially in the spring when they are pupping) are not harmed by the ice road construction and operation
Mine Design	Has the mine been designed to be able to withstand all that Mother Earth can throw at it?
Mine Footprint	How big is the mine's claim block?
	When the mine is built will the company prevent people from travelling across the entire mine site?
	How did the Proponent choose to locate the pits on the site (i.e. how did you decide where to dig)?
	Who owns the surface/subsurface rights at the mine site?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Monitoring	Do you have cameras on-site for monitoring changes to wildlife movements?
	How many people will be monitoring at the mine site for wildlife?
	How wildlife (particularly caribou), water, soil and people around the mine will be monitored to make sure that impacts are identified and limited?
	How often do you check camera data?
	How often do your cameras fall down/break down or otherwise fail?
	Recognizing the failure rate for the cameras, how does the Proponent ensure that their camera monitoring program is sufficient?
	How is the Kitikmeot Inuit Association (KIA) participating in the monitoring of project effects and in ensuring that the Proponent complies with the commitments being made to the KIA and the communities?
	How would community concerns about the project be reported to the KIA; how seriously would these concerns be taken by the KIA?
	What is the role of the Government of Nunavut in monitoring the project effects and in ensuring that the Proponent complies with their legal obligations under legislation for which the GN is responsible?
	Will any of the Federal Departments have a role in monitoring and inspecting the project once it is constructed and mining is underway?
Noise and Vibration	The noise will be 24/7 once the mine starts up; how will that affect the wildlife on the land and especially the caribou (assuming they repopulate that area) could it make the caribou change their migration routes?
Reclamation and Closure	The chemicals such as arsenic, how will the Proponent manage the chemicals that remain on-site, will the Proponent dispose of them only once the mine closes, or will the Proponent send them out during operations?
	How will fuel remaining on-site at closure be dealt with (transported off-site by road)?
	Does the Proponent have reclamation plans in place?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Reclamation and Closure (continued)	If the Proponent has reclamation plans in place, does the Proponent have financial security in place to implement those plans?
	How will the open pits be reclaimed; filled up or left as big holes in the ground?
	Expressed the hope that all parties learn from the past in terms of mistakes that were made with the reclamation of other mines.
	What are the closure and reclamation plans for the reclamation of the Marine Laydown Area? What would be left behind and what would be removed?
Shipping	For shipping that comes from West to East, the western communities (in the Northwest Territories) should be consulted and advised about the shipping routes.
	Will others be using the same shipping route as the Proponent into Bathurst Inlet?
	How is shipping monitored to account for all materials once received in the Marine Laydown area; and how will the Proponent ensure that things are stored securely?
	It was noted that the access to Bathurst Inlet is very narrow for big ships; if there is an accident with the ships coming into the Marine Laydown area would there be anyone there to monitor and respond?
	How many ships will be coming to the Marine Laydown area in any given summer?
	What is the shipping route coming from Montréal?
Tailings	Will the Proponent build the tailings dam/dyke on the tundra?
	How high and how thick will the dams/dykes be built?
	How will you keep wildlife from getting into the tailings facilities?
Terrestrial Wildlife and Habitat	It was noted that there are grizzly bears in the project area; how will the Proponent ensure that grizzly bears along the road do not end up unexpectedly accessing construction materials stored at the Marine Laydown Area.

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Terrestrial Wildlife and Habitat (continued)	Have there been any studies, or are any studies planned for small mammals such as rabbits and lemmings in the vicinity of the site?
Waste Rock	How big will the waste rock pile be?
	What types of waste rock will there be at the site (acid-generating)?
Waste Management	Will the Proponent have a recycling program on-site and if so, has any thought been given to this program being promoted to encourage the employees from the Kitikmeot to recycle when they are back in their home communities?
	How will wastes be dealt with at the site; including storage and disposal of waste chemicals?
Water Management	Does the Proponent have a plan in place to prevent rain and/or snow that falls on the site from getting contaminated?
Winter Ice Road	How high will the embankments be on the ice road? If they are high they may create a very dangerous situation for the animals.
	How is water quality along the ice road being monitored to make sure there is no contamination going into the waterbodies along the winter ice road?
	How many lakes will the winter ice road go over?
	Has the Proponent planned for what to do when variations in temperatures mean that the ice isn't thick enough early enough to enable the Proponent to build and use the winter ice road as planned?
	Will the Proponent build the ice road onto the ocean in the area of the Marine Laydown Area; if so how long will it be operating?
	With a 16-hour return trip between the Marine Laydown Area and the mine does the Proponent plan to have several drivers working for a single trip down the winter ice road?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
SOCIO-ECONOMIC EFFECTS	
Benefits, Royalties and Taxation	How will the Government of Nunavut help the communities to meet the rising cost of living—in the GN's view will this mine support Nunavummiut in addressing these rising costs?
Closure/Temporary Shut downs	How long can the Proponent be in temporary shutdown /suspension to accommodate caribou on-site or other conditions that require a shut down?
Community Engagement	Who decides who should sit on the community advisory committees for this Project?
	The Proponent should communicate more effectively about the kinds of things they are studying in the area so that communities know about what you are studying and when.
	It would be good for the communities in the Northwest Territories to also have a site visit.
Community Infrastructure and Public Services	Will the Proponent be contributing financially to support the residents in the communities in the Kitikmeot generally (not just those people who are employed by the Proponent), such as youth programming and elders' centres?
	What kind of support will the communities expect to/hope to see in the Inuit Impact and Benefit Agreement (IIBA)?
	Will community members be represented on the team negotiating the IIBA?
Culture, Resources and Land Use	Residents noted that the community has used this area for a very long time, with the speaker's grandfather having grown up and becoming an old man on that land and noting that he envisioned that one day there would be a meeting like this about his homeland. There are many traditional sites in the area that should be protected.
	There have been many stories collected (including about the caribou migration) about the area that should be considered before the area develops.
	Dene live off the wildlife the same as Inuit and once mining companies come in and impact the lands they can do a lot of damage to the traditional ways of life.

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Culture, Resources and Land Use (continued)	If the Proponent encounters burial sites is the Proponent required to avoid them or preserve them and not damage them?
	Opinion expressed that there should be a cultural centre or cultural school constructed in the area that can be used to educate the children in the area about their culture and living out on the land.
Economic Development & Self Reliance	Concern expressed that earning more money doesn't always result in better living and sometimes creates social problems if it isn't used to feed the worker's family and put a roof over their heads.
	Will the Government of Nunavut provide support/subsidies for mine employees to buy houses?
	How does the partnership with the GN, Nunavut Housing Corporation and the Proponent work to ensure that employees don't end up paying all of their wages to rental increases for public housing?
Education and Training	Will the Proponent require high school for employment at the mine or will the Proponent provide training for the young people who may have dropped out of school?
	In the mines in the Northwest Territories, initially the mining companies employed young people and then laid them off and hired people from other places in Canada like Newfoundland.
	If someone were to be employed at the mine in the long term would there be transferable skills that an individual might learn that would help them to get employment elsewhere?
	Has the Proponent developed training and presentation materials for the high schools and Arctic College and considered engaging with the youth in schools so that they understand both the opportunities to work while the mine is operating and during the reclamation of the mine?
	When will worker training be available?
	Will there be Inuktitut and Inuinnaqtun language training available to staff on-site?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Education and Training (continued)	Will the Proponent make scholarships available to Kitikmeot students who wish to go to Arctic College?
	Would there be any mechanism for job shadowing for young people ages 14-18 who are too young to work at the mine, but might want to consider it in future?
	Are there any thoughts of bringing simulators into the communities so that youth can do some advance training before the mine goes ahead?
	Will the Government of Nunavut think about expanding the existing apprenticeship and trades training to support getting the workforce ready to take advantage of this opportunity?
Employment & Livelihood	Will employees have to have criminal records checks?
	Are the communities across the Kitikmeot going to be fairly represented in the workforce (i.e. will each community have a set number of employees per community)?
	Stated that mining needs to bring jobs to the area for all stages of the mine from construction, operation and even closure afterward.
	Want jobs, but are concerned about permanent damage to the environment, so development must be done carefully.
	Will there be guarantees with respect to Inuit employment at the mine site (and can the communities believe the numbers that are being presented)?
	How committed is Sabina to maintaining the 2 weeks in and 2 weeks out rotation?
	How will the Proponent be able to assure communities that they can deliver on their employment promises?
	Will the Proponent be open to considering flexibility in terms of hiring for less than full time work and/or for seasonal work when local people cannot be out on the land?
Food Security	Concern expressed that when the caribou are gone how will communities teach their kids and grandkids about hunting and how will communities teach them to live with the caribou as Inuit have always done?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
Food Security (continued)	Concern expressed that long after the mine is gone, communities need to know that traditional food sources will still be here, will still be available for them and that it will still be safe to eat this food.
Human Health and Wellbeing	Will the Proponent have counsellors on-site or addictions counsellors on-site to support employees?
	Will the employee assistance program be only available on-site or will the employees have access to support them while they are off-site?
	Concern expressed that this kind of work can create strains on families who need to have local support in their communities in order to do well in the future.
	What will the facilities be for the people on-site in terms of internet and social media to keep in touch, and will there be fitness facilities on-site.
Inuit Qaujimajatuqangit	Was Inuit Qaujimajatuqangit collected in communities other than Cambridge Bay?
	Can the Proponent consider committing funding to run Inuit Qaujimajatuqangit out on the land programming where elders and youth are partnered and go out on the land together; especially in the Bathurst Inlet area?
	Stated that youth-elder camps in the area have not been held for the last 5 years—it seems this would be a good time to reinstate these camps in the Bathurst Inlet area.
Safety	Will the accommodation for workers have bathrooms in the same building so that workers do not have to walk outside; because it could be very dangerous for them to walk outside to get to the bathrooms if there are bears and wolves in between the buildings?
	Will all employees on-site be required to have first aid training and be capable of responding to a fellow worker getting injured while on-site?
Social Wellbeing	How far does “social well-being” go? Will the Kitikmeot Inuit Association deal with housing in the Inuit Impact and Benefit Agreement?
Worker Demographics	Can you provide a breakdown of the number of employees that have worked for the Proponent in the age bracket of 18-34?

Table 2: Key Issues as Raised by Community Representatives During the 2016 Final Hearing

Subject	Issues/Concerns/Comments
OTHER	
Accidents and Malfunctions	Will you allow the emergency responders at the site to participate in searches for community members?
	Do you have plans in place to prevent surface water or precipitation from getting contaminated from incidents/accidents/spills?
	Will the Proponent participate in/contribute financially to the local Search and Rescue in Cambridge?
	How would the Proponent deal with a spill of fuel at the Marine Laydown area and along the road to make sure that it doesn't spill into the marine environment?
	What would happen if there should be a vehicle breakdown in between the shelters on the winter ice road; will the Proponent be providing satellite phones for every vehicle?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
ECOSYSTEMIC EFFECTS	
Camp	Will the camp that is currently located at the site going to be relocated, or will it just be expanded if the mine ends up being built?
Caribou	Very satisfied with the work that Sabina has done to respond to the big concerns about impacts to caribou raised by the NWT indigenous groups as well as Inuit.
	Who is going to put collars on the caribou; we don't like to see caribou collared for any reason because the fur falls off under the collar and the health of the collared animals suffers.
	Why are the caribou collared; is there no other way to get this information? It is not the Inuit way to collar caribou.
	Why is the stress hormone study only being conducted once, and why only 2 years after the project begins; isn't that a little early to show effects?
	It is very important to cross-border communities that caribou migration not be affected and, in particular, these communities want to ensure there are no effects on caribou in when they are in their caribou-calving grounds. Although our communities are interested in economic growth, the health of the wildlife and caribou are also very important to us.
	Hunting caribou is not just about feeding us, it is about our very survival as a people.
	How will work stoppages for caribou work and what will happen if the caribou are there for more than a few hours/days/weeks?
	Mining will destroy the food that the caribou eat and that will mean that they may end up coming into areas that they don't come into now; has Sabina considered those effects?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
	I am an elder and when I was young the caribou were not very numerous and we used to have to travel very far away to find caribou. I have learned it is part of a cycle; caribou don't like noise but there are other factors in addition to mining, like predators that go after the caribou during calving season; our ancestors would tell us that we should not hunt for caribou if we are not going to eat them; the caribou population is a cycle and I have always been concerned about it; may be when our youth are elders the population will grow again.
Caribou (continued)	I am an elder and I have noted that the decline in the caribou population is linked with predation—wolves will kill caribou that they do not even eat and a wolf can have 5-6 pups each year while caribou will have only one or two calves.
	Can Inuit in the more eastern communities be involved in some of the caribou monitoring committees that are being proposed so that the voices in those communities can also be heard and considered?
	How many caribou does the Government of Nunavut currently have collared?
	How is caribou monitoring data generated by Sabina feeding into and adding to the caribou data that is in the possession of the Government of Nunavut?
Climate Change	Glad to see more focus on ensuring the project can respond effectively to challenges created by the effects of climate change.
Country Food	I rely on country food but I am in support of Sabina opening the mine so that young people can get work if the mine will be operated so that there is no impact on the animals and fish in the area.
	Have noticed that the quality of country food lately has changed (maybe due to climate change).
Dust	How far will the dust travel from the mine (arsenic dust has blown from Giant mine for many, many kilometres away)?
Erosion	There was significant erosion in this area once that ended up with people losing their homes when the land gave way; Sabina needs to be aware of the instability and effects of erosion on the lands.

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
Fish	Bernard Harbour project has been selected as a project to receive an award as a model of Inuit and industry participation.
	Don't want to see structures like dikes and dams in the water that would limit fish passage.
	We have an abundance of fish in our ocean; how would we apply to set up a commercial fishery?
Fish Out	Will Sabina take steps to ensure that the fish dying during the fish out get distributed to community members?
Fish Out (Continued)	How are fish outs accomplished?
Footprint of the Claim Blocks	What is the size of Sabina's claim blocks?
Footprint of the Mine	Would the footprint of the mine when built vary significantly from the footprint of the mine as presented in the Final Environmental Impact Statement?
Fuel Offloading	When Sabina is offloading fuel via the pipeline is there any way Sabina can ensure that the pipeline is very clearly marked and maybe even put flagging or barricades around the pipeline so that no one runs into or over it?
Fuel Tanks	Where will the fuel tanks be located at the site when the full camp is constructed? Will the fuel tanks be concentrated in a central part of the site or will be they be spread out?
Marine Environment	How much drinking water will Sabina be drawing from the ocean into the desalination plant; and then how much water will be put back into the marine environment?
Marine Laydown Area	How much drinking water will you be drawing from the ocean into the desalination plant; and then how much water will be put back into the marine environment?
	What activities are going to be undertaken in the Marine Laydown Area during the summer that potentially could affect the caribou in that area?
	Who is Sabina going to use as a shipping company?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
	Is the shipping company going to have a captain that is familiar with Bathurst Inlet?
	If the project were approved to go ahead, when would the first shipment go into Bathurst Inlet and be delivered to the marine laydown area?
	When Sabina constructs the marine laydown area how will Sabina make sure to clean up all the debris that will result from the construction activities and the materials Sabina brings to that site?
Marine Wildlife and Marine Habitat	We understand that the marine mammals have been studied near the Marine Laydown Area in advance of the mine development, will there also be a study of the marine mammals once the mine is no longer active?
Monitoring	Will there be monitoring of the water quality in the Ellis River (as the Goose Lake ultimately flows into the Ellis River)?
Power Sources	Has Sabina thought about using alternative power sources so that the mine can reduce the amount of fuel that would be used to generate power at the site (especially considering the use of wind power)?
Processing Gold	How does Sabina plan to process the gold and will it be necessary for Sabina to use high temperature roasting/melting and/or the addition of chemicals to get the gold out of the rock?
	How does Sabina propose to deal with arsenic that is released during processing?
	How is the processing at Sabina's proposed mine going to be different than Giant Mine (for example, how will Sabina prevent arsenic from coming out of the stacks)?
Reclamation and Closure	Sabina must remember they are proposing to build a mine in a pristine environment; when Sabina is done it is important to return the area the company leaves behind at closure in the same condition as Sabina found it.
Sewage Treatment	How is Sabina intending to treat sewage (and specifically what will Sabina do with the solids)?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
Shipping	Communities have noticed recently that the water levels in Bathurst Inlet have been steadily declining, which has exposed some reefs in the area and reduced the depth of the channel in certain areas. Has Sabina developed some contingency plans to ensure that shipping can continue safely even what water levels are unexpectedly low (e.g. sending a smaller vessel into the Inlet to ensure that the larger ship can make it in)?
	Sabina has indicated 3-5 ships per year—is that ship passages or is that the total number of ships that will be transiting in any year?
Shipping (continued)	Will there be any permanent structures in the landing area for shipping (such as a deep sea port)?
	What will Sabina's primary shipping season be?
	Our biggest concern is that there could be an accident/fuel spill along the shipping route. To ensure safe passage, Sabina must ensure that any shipping contractors are required to have as up to date mapping of the shipping route as is necessary to ensure that everything is safe.
	Can the information that is shared by the Canadian Coast Guard and Transport Canada with Sabina and other parties regarding shipping traffic in the area be shared with local Hunters and Trappers Organizations?
	Can you tell us what you will be using as the preferred shipping route?
Tailings	What will be in the mine tailings?
	How will Sabina make sure that there are no birds, caribou or other wildlife attracted to the tailings areas?
Terrestrial Wildlife and Habitat	Sabina needs to ensure that all wildlife is protected, including caribou, grizzly bears, wolves, wolverine and all the animals we rely on.
Waste Management	How are hazardous wastes going to be handled and will Sabina be disposing of any hazardous wastes at the mine site?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
Water Management	If there is any water that has to be treated at the site, what would Sabina be required to do with any residual contaminated water that has resulted from treatment?
	Nearby communities don't want to see dams and dike structures outside the mine footprint.
Winter Ice Road	The winter road and specifically, right around the ravine area, tends to warm up more quickly than in other areas. How will Sabina ensure that the winter road can be traveled safely throughout the season, especially considering that you will be transporting fuel.
Winter Ice Road (continued)	What if the snow and ice melts earlier than Sabina's mid-April planned shut down of the road?
	It will be very important to make sure that the winter road is well engineered and constructed and that the routing reflects traditional knowledge and Inuit Qajimajatuqangit.
	Sometimes it is too cold for vehicles to travel on the road and vehicles could break down and be stranded for some time without rescuers being able to reach them.
	Sometimes oil leaking from vehicles on the snow can happen; how will Sabina prevent this from resulting in damage when it melts?
	Concerned with how roads will be constructed over streams and river crossings without damaging the watercourse, or the banks/shore of these waterbodies.
	Does Sabina intend to build the winter road in the same route year after year?
	How will Sabina make sure that piles of snow don't build up along the winter road and create a safety hazard for snow machines trying to cross the road?
	What is Sabina's threshold for thickness of snow on the land in order to construct the winter road?
SOCIO-ECONOMIC EFFECTS	

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
Archaeological and Paleontological	There are many archaeological and paleontological sites in this area and we do not want to see any disturbed during helicopter landings, exploration and site construction.
Benefits, Royalties and Taxation	Will the Kitikmeot Inuit Association be conducting community consultation on the terms and conditions of the Inuit Impact Benefit Agreement prior to finalizing the Agreement?
Certifications and Licensing	The Government of Nunavut does not yet recognize licences that are issued in other jurisdictions (e.g. Class 5 Licence issued to Ekati Heavy Equipment Operators is not recognized as a valid driver's licence when the operator returns to their home community in Nunavut)
Change in ownership from Sabina to a new mining company	What happens to Sabina's commitments if there is a change to the mining company after an approval is granted but before the company carries out the mining?
	Will there be another mining company taking over to build the mine?
Community Engagement	Communities want to be kept up to date with information on an on-going basis, not just mine development but also when companies are doing exploration work.
	Remember when you are communicating with the communities that some people cannot read very well so written notice may not be sufficient; Sabina should communicate in other ways too.
	How fast would communities receive notice if something happens that could result in damage to the land?
	How often is Sabina planning to be in the communities to gain traditional knowledge and also to provide information?
Community Infrastructure and Public Services	When the mine is up and running what kind of plans does Sabina have to provide sponsorships and donations to the various communities to support things like maybe building swimming pools?
	If this project were approved to proceed, would the Government of Nunavut restore services to the communities of Omingmaktok (Bay Chimo) and Kingaok (Bathurst Inlet) such as fuel deliveries and construction/renovation of houses there?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
Culture, Resources and Land Use	Unclear whether some of the boundaries on project maps properly identify areas that are traditionally used by Inuit.
	It is important to have cross-cultural training at the mine site that goes both ways – the mine's managers learning about Inuit culture and Inuit employees learning about the mining company culture.
Daycare/child care	Many women want to work for the mining company but do not have access to child care, so it is difficult.
	How can the Government of Nunavut make sure that all communities have access to daycare that is affordable?
Decision-making for the Project	How will a decision in respect of this project be made…what is the process and how are Inuit voices heard in these processes?
Economic Development & Self Reliance	Many men from Kugluktuk had worked in the past (since the 1970s) as miners and oil and gas workers, but then became unemployed. Many are working again now, but the 2 week rotational work puts strain on families, with women having to hunt while their husbands are working at the mine. There are pros and cons—working enables people to provide for their families but there are alcohol problems and family break ups sometimes.
Education and Training	When will the trades training be available to people who want to train to work at the mine site?
	Where and when will training be conducted so that people can get trained to work in the mine?
	Are youth going to be able to get a job without graduating from high school? We have difficulty getting students to finish high school, and it is important that they be encouraged to graduate if they can; but if they can't graduate they need some support to get the required education to get good jobs.
	Will the Government of Nunavut have training conducted in communities like Arctic College is currently doing by providing mine training in Cambridge Bay?
	How will the Government of Nunavut's recent cut backs to Arctic College affect the training that can be offered in this region (changes to the type of training offered, where it is offered and the people who can get this training)?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
Employment & Livelihood	How do our communities and Sabina encourage people, especially young people to seek employment rather than relying on income support as their opportunity for a better future?
	Would like to see youth employed and hope that would prevent them from having drug and alcohol problems.
	Inuit need to work together to develop our own employment within the communities and not take the short cut to have our land (Nuna) is destroyed
Employment & Livelihood (continued)	Some young people have reported sending in their applications to get work but then not getting any contact back and when they don't hear back they don't want to continue trying to get hired and lose hope they will get work; and for young people who do get hired, but then lose their jobs, who can they turn to if they have been let go by companies unfairly?
	Does the Government of Nunavut set objectives for Inuit employment for mining companies; and if so, how does the Government of Nunavut monitor these statistics and enforce these objectives?
Human Health and Wellbeing	Workers need to have support while they are on-site but employees and their families at home also need to have access to assistance programming for their families when they are at home.
	There are many routes for determined people to bring in alcohol and drugs into the mine site—how will Sabina and the Kitikmeot Inuit Association (through arrangements with the airlines and screening of luggage) work to make sure these substances do not end up at the mine site or being distributed to dry communities via the mine site?
	There is currently no place in Nunavut where people who are addicted to drugs and alcohol can go for treatment; has the Kitikmeot Inuit Association considering developing a treatment centre to support people who are trying to make a better life for themselves.
	Some of the boundaries on Slide 6 of the Human Health assessment do not include areas the communities consider to be very important how did Sabina determine these boundaries?

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
	Can the Kitikmeot Inuit Association provide an indication of whether or not they will support the youth centre in Gjoa Haven?
Inspections	Will the Kitikmeot Inuit Association conduct inspections of the mine site and/or will they be coordinating inspections with the mine site inspectors?
Inuit Qaujimajatuqangit/ Traditional Knowledge	Very happy to see Sabina is using Inuit Qaujimajatuqangit/traditional knowledge in the development of this Project.
Inuit Qaujimajatuqangit/ Traditional Knowledge (continued)	How does the Kitikmeot Inuit Association ensure that Inuit Qaujimajatuqangit and traditional knowledge is collected and preserved about the areas potentially affected by the mine? Our communities are losing elders every year and with each passing we lose more knowledge if it is not preserved.
	The collection and preservation of Inuit Qaujimajatuqangit/traditional knowledge is not a one-time thing and should not be only taught once; is there any way that elders could be employed and/or compensated for providing their Inuit Qaujimajatuqangit / traditional knowledge?
Life of the Mine	How long will the mine be operational?
Place Names	In Gjoa Haven we do not call the area Back River—this is a different area to us and we find it very confusing to refer to this as the Back River Project.
	I would like to see maps that show better where the project is, relative to the Back River that I know.
Rotational Working	Will workers be passing through Yellowknife or can they go directly from the communities without passing through Yellowknife (which is our preference)?
	Is Sabina going to provide recreational/entertainment opportunities for mine workers so they don't get so homesick?
Safety	I have lost relatives to accidents that took place when they were working with the mines and Sabina needs to ensure the mine site has a culture of safety.
OTHER.	

Table 3: Key Issues as Raised by Community Representatives During the Supplemental Final Hearing

Subject	Issues/Concerns/Comments
Accidents and Malfunctions (Spills, Incident Response, etc.)	Sabina should work with communities and the Canadian Coast Guard to coordinate some oil spills response training exercises that are being planned for the year ahead.
Accidents and Malfunctions (Spills, Incident Response, etc.) (continued)	How does Sabina expect that placing spill materials in Omingmaktok (Bay Chimo) and Kingaok (Bathurst Inlet) and expecting residents to be trained in spill response would be an effective addition to emergency response capacity when most of the people from those communities are in Cambridge Bay at various times throughout the shipping season. What would happen to Sabina's emergency response plans if there isn't anyone else around in the nearby communities when something bad happens?
	If there is an accident during shipping would Transport Canada shut down shipping in the Inlet until it is investigated?
	If there is an accident during shipping who (what government agency) would be responsible for responding to the incident?

4 ECOSYSTEMIC EFFECTS

Sabina Gold & Silver Corp. (Sabina or the Proponent) described its overall approach for analyzing potential project-induced ecosystemic effects in Volume 9, Section 1 of its FEIS. Sabina noted that its development of the FEIS and assessment of potential ecosystemic impacts were consistent with requirements outlined in section 12.5.2 of the *Nunavut Agreement*, the NIRB's EIS Guidelines for the Back River Project, regulatory requirements, and was influenced by Traditional Knowledge shared through various consultation opportunities. Sabina undertook the following steps in assessing potential project-induced ecosystemic effects during engineering, mobilization and construction, operations, reclamation and closure, and post-closure phases:

- Established scope, which encompassed selecting valued ecosystem components (VECs) and defining spatial and temporal boundaries;
- Identified potential project interactions with each VEC;
- Characterized potential effects;
- Identified mitigation and management measures to eliminate or reduce potential effects;
- Characterized potential residual effects; and
- Determined significance of predicted residual effects.

Sabina focused its assessment of potential project-induced ecosystemic impacts on VECs and subjects of note (SON) selected during the development stages of the FEIS. The SON and VECs were selected based on consultation with potentially affected communities and regulatory agencies, recommendations in the NIRB's EIS Guidelines, Traditional Knowledge input, and other regulatory considerations. Sabina noted that it had conducted public consultations in the Kitikmeot region, Iqaluit, and the Northwest Territories throughout various stages of FEIS development (see Section 5.0: Socio-Economic Effects). It was further noted that Traditional Knowledge was collected directly through consultation with community members and indirectly through consideration of written material, including academic literature, and a project-specific Traditional Knowledge report published by the Kitikmeot Inuit Association.[58] Using information provided by the sources listed above, Sabina identified the following VECs and SON for its impact assessment:

- Atmospheric Environment
    - VEC: Air Quality and Noise and Vibration; and
    - SON: Climate and Meteorology.
- Terrestrial Environment
    - VECs: Vegetation and Special Landscape Features, Caribou, Grizzly Bear, Muskox, Wolverine and Furbearers, Migratory Birds, and Raptors; and
    - SON: Geology, Permafrost, and Landforms and Soils.

[58] Kitikmeot Inuit Association. (2012). Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP). Prepared for Sabina Gold & Silver Corp. by Kitikmeot Inuit Association: Kugluktuk, NU.

- Freshwater Environment
    - VECs: Hydrology, Water Quality, Sediment Quality, Fish/Aquatic Habitat, and Fish Community; and
    - SON: Groundwater, Limnology and Bathymetry.
- Marine Environment
    - VECs: Water Quality, Sediment Quality, Fish/Aquatic Habitat, Seabirds/Seaducks, and Ringed Seals; and
    - SON: Physical Processes.

For its assessment of potential project-related ecosystemic impacts, Sabina established distinct temporal and spatial boundaries for each VEC assessed within the FEIS. The temporal boundaries for each VEC were defined in association with planned activities over the lifetime of the Project – mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases). Potential impacts on VECs were assessed within boundaries established as the project footprint, Local Study Area (LSA), and Regional Study Area (RSA). Specific spatial boundaries are defined for each VEC and are presented as maps within the supporting volumes of each respective VEC (see corresponding sections for specific extents).

Sabina characterized potential effects from the project on VECs through quantitative (e.g., predictive modelling and recent field studies), semi-quantitative (e.g., measured site-specific data and existing site information) and qualitative (e.g., expert opinion, traditional knowledge input, and literature review) techniques. To characterize and predict potential impacts of project components and activities on VECs, Sabina conducted air quality modelling, noise modelling, water quality modelling, marine spill modelling, and Bathurst caribou herd resource function modelling studies.

In the development of impact mitigation and management measures, Sabina considered potential solutions to avoid, reduce, control, eliminate, offset, or compensate potential project impacts on VECs. It was noted that existing working samples within the Arctic were used to develop specific mitigation and management measures prescribed for each VEC. Key project mitigation approaches include:

- Optimizing alternatives – Change aspects to prevent or reduce adverse environmental effects;
- Design changes – Redesign aspects to prevent or reduce adverse environmental effects;
- Best Achievable Control Technology – Use proven and economically viable technology to eliminate, minimize, control, or reduce adverse environmental effects;
- Management practices – Employ specific management protocols to eliminate, minimize, control or reduce adverse environmental effects;
- Follow-up monitoring and adaptive management – Monitor mitigation measures and employ adaptive measures based on monitoring results;
- Compensation – Offset remaining effects through remedial or compensatory actions; and
- Enhancement – Provide measures to enhance beneficial effects.

As prescribed in Section 9.8 of the EIS Guidelines, Sabina included a residual effects assessment within the FEIS. It was noted that potential negative effects expected to be eliminated through proposed

mitigation measures, as well as residual effects assessed as positive or neutral, were not evaluated for potential residual impacts. Potential residual effects identified in the FEIS were analysed for significance by determining the direction of the residual effect (positive, neutral, or negative), rating the effect to determine significance, determining the likelihood of the effect occurring, and evaluating whether the likely adverse residual effect would be significant.

Sabina applied the following summary attributes to express overall significance ratings to characterize the nature of potential residual effects (effects occurring after mitigation measures have been implemented):

- Significance Criteria
- Direction (positive, neutral, negative)
- Magnitude (low, moderate, high)
- Duration (short, medium, long)
- Likelihood of Occurrence
- Frequency (once, sporadic, continuous)
- Geographic Extent (footprint, local, regional, beyond regional)
- Reversibility (reversible, reversible with effort, irreversible)
- Overall Significance Rating
- Probability (unlikely, moderate, likely)
- Confidence (low, medium, high)
- Not Significant/Significant/Positive

Sabina noted that its overall significance ratings were derived from the ranking of contributing attributes by the environmental practitioners who prepared the FEIS. Sabina added that although the determination of significance was largely based on professional judgement, general criterion were applied and can be summarized as follows:

- If the magnitude of an effect was considered low, the predicted effect was stated to be “not significant”;
- If effects on measurable components (e.g., air or water quality) were predicted to meet applicable performance criteria, standards, or guidelines, the magnitude of the effects were considered negligible or moderate and the predicted effects were considered to be “not significant”;
- If the geographic extent of an effect was considered to be confined within the project footprint or LSA, the predicted effect was considered likely to be “not significant”;
- If effects were considered to have high to moderate reversibility, predicted effects were considered likely to be “not significant”; and
- If the duration of an effect was considered short term then the effect was predicted likely to be “not significant”.

As part of Sabina’s overall Environmental Management System (EMS), specific environmental

monitoring and management plans (EMP) were developed for occupational health and safety, risk management and emergency response, spill contingency, the biophysical environment, and the human environment throughout the life of Project. Sabina noted that all biophysical monitoring and management plans focused on VECs identified in the FEIS and indicated that EMPs were developed using continuous improvement and adaptive management principals. Sabina indicated that each biophysical EMP identified the targeted VEC, associated regulatory requirements, potential effects and proposed mitigation measures, indicators and monitoring requirements, parties responsible for the implementation and follow-up of the EMP, as well as auditing, reviewing, and reporting requirements.

Sabina conducted a cumulative effects assessment (CEA) for each VEC identified as having a potential negative project-induced residual effect. The temporal boundary of the CEA encompassed past, present, or future projects and human activities in the Kitikmeot region and the Northwest Territories (NWT) that were considered to potentially interact with project specific VECs. The assessment included potential interactions with the following five (5) past, four (4) existing, and eight (8) future projects:

- Past: Lupin Gold Mine, Jericho Diamond Mine, Roberts Bay and Ida Bay Silver Mine, Tundra Gold Mine (NWT), and Salmita Gold Mine (NWT);
- Existing: Doris North Hope Bay Belt Gold Mine Project; Ekati Diamond Mine (NWT), Diavik Diamond Mine (NWT), Snap Lake Diamond Mine (NWT);
- Future: George Gold and Silver Mine Project, Bathurst Inlet Port and Road Project; Hackett River Base Metals Mine Project; Phase 2 Doris North Hope Bay Belt Gold Mine Project, Izok Corridor Base Metal Mine Project, Canadian High Arctic Research Station, Guacho Kué Diamond Mine Project (NWT), and Courageous Lake (Tundra) Gold Mine Project (NWT).

In characterizing potential cumulative residual effects, Sabina assumed that the other resource development projects included in the assessment would adopt similar mitigation and management measures to those proposed for the Back River Project.

Sabina conducted a transboundary impact analysis to assess the potential for project-related transboundary impacts. VECs identified within the atmospheric, terrestrial, freshwater, and marine environment were all assessed for their potential transboundary impacts. Although Sabina identified no significant residual effects resulting from the Project, all non-significant residual effects were still included in the analysis.

On February 16, 2017 Sabina submitted a Final Environmental Impact Statement Addendum (FEIS Addendum) to the NIRB to support the Board's further Review of the Back River Project. The FEIS Addendum contained new or updated information in relation to five (main) ecosystemic issues, including caribou and terrestrial wildlife, freshwater aquatic environment, marine environment, water quality (ground and surface), and climate and meteorology, as well as other relevant topics. Sabina structured its FEIS Addendum in 10 volumes which corresponded to its original FEIS document, and remained consistent with the NIRB's EIS Guidelines. Volumes 1 to 9 included additional content as well as select supplemental appendices pertaining to impact assessment studies and supporting documents, and Volume 10 contained new or revised management plans. Within the FEIS Addendum Sabina noted that the new or updated information was intended to generate a higher degree of confidence in the

proposal and generally did not affect FEIS sections, such as effect assessments, transboundary effects, and cumulative effects.[59]

The following volumes were included within the FEIS Addendum to supplement specific sections of the FEIS with new and/or updated information:

- Volume 1 Addenda: Main Volume
- Volume 2 Addenda: Project Description and Alternatives
- Volume 3 Addenda: Public Consultation, Government Engagement, and Traditional Knowledge
    - 3.3 Traditional Activity and Knowledge
- Volume 4 Addenda: Atmospheric Environment
    - 4.3 Climate and Meteorology
- Volume 5 Addenda: Terrestrial Environment
    - 5.3 Landforms and Soils
    - 5.4 Vegetation and Special Landscape Features
    - 5.5 Caribou, Potential Cumulative Effects Assessment, and Transboundary Effects
- Volume 6 Addenda: Freshwater Environment
    - 6.1 Surface Hydrology
    - 6.4 Freshwater Water Quality
    - 6.6 Freshwater Fish/Aquatic Habitat
- Volume 7 Addenda: Marine Environment
    - 7.4 Marine Fish/Aquatic Habitat (*7.2 Marine Water Quality*)[60]
    - 7.5 Marine Fish Community (*7.7 Ringed Seals*)[61]
- Volume 8 Addenda: Human Environment
    - 8.3 Socio-economics
    - 8.6 Human Health and Environmental Risk Assessment
- Volume 9 Addenda: Methodology, Effects of Environment on Project, Accidents and Malfunctions
    - 9.3 Accidents and Malfunctions
- Volume 10 Addenda: Management Plans
    - 10.4 Fuel Management Plan
    - 10.5 Spill Contingency Plans

[59] FEIS Addendum, Volume 1, p. iv.

[60] Through subsequent correspondence with the NIRB, Sabina confirmed that Section 7.4 Marine Fish/Aquatic Habitat should have been labelled Section 7.2 Marine Water Quality.

[61] Through subsequent correspondence with the NIRB, Sabina confirmed that Section 7.5 Marine Fish Community should have been labelled Section 7.7 Ringed Seals.

- 10.6 Oil Pollution Emergency Plan
- 10.19 Aquatic Effects Management Plan
- 10.20 Wildlife Mitigation and Monitoring Program Plan
- 10.21 Conceptual Fish Offsetting Plan
- 10.30 Vegetation Monitoring Plan
- 10.31 Conceptual Fish-out Plan

Sections 4.1 through 4.14 of this revised Final Hearing Report detail information provided as part of the FEIS Addendum or during the supplemental Review phase specific to the Proponent's consideration for the Project's ecosystemic effects and proposed environmental management plans. Submissions provided to the NIRB by the Proponent and parties following the release of the 2016 Final Hearing Report, as well as comments and responses received by the NIRB from parties and Sabina during the supplemental Review phase, and discussions and information presented during the supplemental Final Hearing, were given careful consideration and are referenced within each section as deemed appropriate. The Board's updated views and recommendations are also provided specific to each topic of the ecosystemic effects, with the project-specific recommendations summarized later in Section 8: Recommended Project-Specific Terms and Conditions of this Report.

4.1 AIR QUALITY

4.1.1 Views of the Proponent

Sabina collected baseline air quality data in the project area between 2011 and 2013 to understand existing baseline conditions and to provide benchmarks to support predictive modelling for the analysis of potential project-induced effects. The data collected was used to assess potential direct and indirect effects resulting from the Project, and the results, along with conclusions, were presented in Volume 4 Section 1 of the FEIS. Baseline information was provided in Appendix V4-1A: Back River Project – 2011-2013 Air Quality Baseline Report. Air quality modelling assessments for the Goose Property and Marine Laydown Area (MLA) were included in Appendix V4-1B: Air Quality Modelling Assessment – Goose Property and Appendix V4-1C: Back River Project – Air Quality Modelling Assessment: Marine Laydown Area, respectively. Sabina provided an outline of how it incorporated Traditional Knowledge into its assessment of air quality in Volume 4, Section 1.2 of the FEIS. Following an assessment of potential project interactions with air quality, Sabina identified exceedances for six (6) air quality indicators that were considered potential residual effects. Sabina noted, contingent on the application of specific mitigation measures, that the potential residual effects identified in its assessment would be not significant, nor would they contribute to cumulative or transboundary impacts.

Sabina identified the following three (3) general spatial assessment boundaries for its effects assessment on air quality:

- *Potential Development Area (PDA)* – Includes the project footprint (areas of expected physical disturbance at the Goose Property and MLA) in addition to a 'small' surrounding buffer zone.
- *Local Study Areas (LSA)* – Includes the PDA and a buffer zone to account for environments expected to be subject to immediate project-induced impacts.
    - *Goose Property LSA* – Includes the PDA in addition to a 10 kilometre (km) buffer zone.

- *Marine Laydown Area LSA* – Includes the PDA in addition to a smaller buffer zone of approximately three (3) km.

- *Regional Study Area (RSA)* – Includes the PDAs and LSAs, in addition to a minimum buffer zone of 10 km with a total assessment area of approximately 12,620 square kilometres (km^2).

Sabina aligned the temporal boundaries for the air quality effects assessment with the Project phases used throughout the FEIS, which include the construction, operation, reclamation and closure, and post-closure monitoring phases (see Section 2.2.3: Project Phases).

To establish baseline air quality conditions, data was collected from dustfall monitoring stations, passive air sampling systems (PASS), BGI PQ100-FRM particulate samplers, and from other ambient air quality stations in the Kitikmeot region. In the FEIS Sabina used a CALPUFF air dispersion modelling system to predict potential effects of the Project over its anticipated lifetime. As discussed in Volume 4, Section 1.4.2, the air quality assessment focused on project years predicted to have the highest emissions, and the model was run accordingly. Sabina reasoned that if emissions during peak years were found to be not significant, then potential effects from the entirety of the Project should also be not significant. Through its air quality assessment, Year 3 of operations was identified to have the highest emissions for both the Goose Property LSA and the MLA LSA. It was noted that the main sources of potential emissions associated with the project are stack emissions, vehicle exhaust emissions, fugitive dust emissions from vehicles, aircraft emissions, and emissions associated with blasting.

Sabina considered eight (8) air quality indicators in its air quality assessment, including nitrogen oxide (NOx as NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), total suspended particulates (TSP) matter, particulate matter (PM_{10}), respirable particulate matter ($PM_{2.5}$), dust deposition, and acid deposition. It was noted in the FEIS that volatile organic compounds and ozone were not included as indicators in the assessment programs as the potential associated emission rates were considered insignificant. Within Volume 4, Section 1.10 of the FEIS, Sabina concluded that after comparing results with relevant territorial and federal standards, six (6) indicators (SO_2, NO_2, CO, TSP, PM_{10}, and $PM_{2.5}$) showed exceedances beyond the PDA and were considered potential residual effects. The predicted residual effects were attributed to dust expected to be generated from open pit mining activities and dust generated by unpaved roads on-site. Sabina predicted that dust deposition would be below objectives and/or standards at all modelling locations, and acid deposition exceedances would be contained within both PDAs; therefore, both indicators were not considered to contribute to potential residual effects on air quality.

Sabina predicted, contingent on the application of mitigation measures, that the potential residual air quality effects identified would be not significant. Due to the expected moderate magnitude, reversible, and localized nature of the effects, Sabina further indicated that these effects would not contribute to cumulative or transboundary impacts. Mitigation measures in the assessment included: energy efficiency measures; winter and all-weather road design optimization; measures to reduce fuel use; dust suppression measures; proper maintenance of equipment; and the use of emission control systems such as wet scrubbers, baghouses, and filters. In Volume 10, Section 17 of the FEIS, Sabina provided an Air Quality Monitoring and Management Plan which included commitments for the development of an Emissions Reduction Strategy, Dust Reduction, and Incineration Management plans as well as an Air Quality Monitoring Program.

Sabina's FEIS Addendum did not contain an update to the air quality section provided in the FEIS.[62] However, during the supplemental Final Hearing, Sabina reviewed studies it conducted as part of its dust analyses, and reiterated the proposed mitigation and monitoring measures Sabina had proposed to protect ecosystemic features, vegetation, wildlife, and human health. In the Proponent's response to final written submissions on the FEIS Addendum and during the supplemental Final Hearing, Sabina did highlight that updates to the Wildlife Mitigation and Monitoring Program Plan (WMMPP) in 2017 included additional dustfall monitoring stations at greater distances from the project site.[63]

4.1.2 Views and Concerns of Interested Parties

During the 2016 Final Hearing, Board staff questioned Sabina on the specific dust management measures Sabina proposed to implement on-site and on the air quality thresholds established to trigger mitigation or adaptive management measures. Through a deferred response, Sabina outlined its Air Quality Monitoring and Management Plan and noted 19 proposed mitigation measures associated with air quality, including, but not limited to, frequent watering of the site roads, use of dust suppressants at the crushing facility, and covering vehicle loads. Sabina committed to implementing a dust reduction plan that would be revised to incorporate final mitigation measures upon finalization of design plans (e.g. purchasing of vehicles). Sabina further noted that it had established three (3) criteria that would trigger the use of adaptive management measures, including if monitoring results indicated "*increasing trends for contaminant concentration*" and if issues were raised by regulators or local communities.[64]

A Community Representative from Behchokǫ̀ expressed concern with regards to dust particles in Goose Lake area when the mine is in operation, specifically that "*…there's going to be a lot of activity happening and vehicles going back and forth hauling rocks, and there's going to be blasting happening, and there's going to be loading of these rocks.*"[65] The representative further noted airborne dust sampling methods used at the Ekati Diamond Mine in the Northwest Territories and requested clarification on Sabina's proposed monitoring plan. In its response, Sabina discussed its proposed dust management measures, including watering roads and use of dust suppressants and monitoring through the use of dust sampling stations placed up to five (5) kilometres downwind of the site and further control stations. Sabina also indicated that the Ekati mine is over five (5) times the operational size of the Back River Gold Project.[66]

A Community Representative from the Łutsel K'e Dene First Nation further commented on potential dust-related effects and the importance of monitoring, noting that the wind blows dust *"… a long, long ways… because there are no trees to protect the wind when it blows here…"*[67] They stressed the importance of comprehensively monitoring the entire project area, not just around the proposed mine site.

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[62] FEIS Addendum, Volume 1, Appendix VI-1A: Table of Concordance, at p. 25.

[63] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 213-214, lines 26 and 1-7.

[64] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing No. 12MN036 Transcript, April 25, 2016, pp. 164-166.

[65] P. Rabesca, Behchokǫ̀, Northwest Territories, NIRB 2016 Final Hearing No. 12MN036 Transcript, April 29, 2016, p. 1043, lines 2-5.

[66] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing No. 12MN036 Transcript, April 29, 2016, pp. 1045-1046, 14-26, 1-9.

[67] A. Enzoe, Łutsel K'e, Northwest Territories, NIRB 2016 Final Hearing No. 12MN036 Transcript, April 30, 2016, p. 1341, lines 15-18.

During the supplemental Final Hearing in 2017, Community Representatives also commented on their concerns about potential project impacts from dust to various ecosystemic features, including effects on soil, vegetation, and wildlife. A Community Representative from Taloyoak commented that:

> *… maybe perhaps it's due to climate change or animal behaviour. We don't know. But when we consume and eat country food, the texture is different. That's the one thing that I've noticed. I'm not saying it's bad. It's just an observation that I've made.*[68]

Sabina responded with a summary of its commitments to monitor project components which have the potential to impact wildlife, including water quality, dust on vegetation, as well as wildlife interaction with project components. Sabina further noted its commitment to monitoring programs that ensure country food remained healthy and safe to eat.[69]

A Community Representative from Behchokǫ̀ expressed concerns regarding blasting activities associated with mine operations:

> *…we're concerned about blasting from the -- from the rocks, and then the --including the -- where the one -- wind blows and where all the dust that, you know, has been carried away -- how far dust travels and all that creates some problems/concerns... it might be considered as an acid rain, I guess, and once the dust goes up, I guess it has to come down, and I guess, you know -- and so they create some hazard for the wildlife animals.*[70]

Similarly, a Community Representative from Wekweètì voiced concerns related to arsenic-laden dust and its potential associated impacts to human health, and referenced studies conducted surrounding Yellowknife's Giant Mine:

> *…the study that they done around Yellowknife Giant Mine, I guess, you know, like, the amount of how far the – the arsenic dust that has been blown over, I don't know, about 150 kilometres away from -- from the mine, I guess, is how far the arsenic has blown over… These are the things that our home community are concerned of.*[71]

In response, Sabina highlighted that arsenic issues associated with the Giant Mine would not exist at the Back River Project, as neither the blasting nor the processing of the ore would produce arsenic trioxide as was the issue at the Giant Mine in the Northwest Territories.[72]

For specific discussions on potential impacts of dust on wildlife and vegetation, see Section 4.10: Vegetation, Section 4.11: Terrestrial Wildlife and Wildlife Habitat, and Section 6.1: Human Health and Environmental Risk Assessment.

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[68] S. Oleekatalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 698-699, lines 18-26 and 1-21.
[69] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 700, lines 1-17.
[70] M.L. Rabesca, Behchokǫ̀, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 723-724, lines 13-26 and 1.
[71] J. Judas, Wekweètì, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 727, lines 1-17.
[72] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 730-731, lines 24-26 and 1-3.

4.1.3 Views of the Board

The Board notes that throughout the Board's Review of the Project Sabina has committed to implementing various mitigation measures, as well as developing and updating existing air quality plans through collaboration with various parties, as project designs are finalized. The Board acknowledges the validity of the air quality assessment conducted by Sabina. On the basis of the assessment information provided by the Proponent and the comments of Intervenors and Community Representatives and Sabina's commitments made throughout the review process, the Board has concluded that all air quality parameters outlined in Sabina's assessment, and included within the proposed Air Quality Monitoring and Management Plan, can be managed appropriately to ensure that all impacts are mitigated throughout the Project.

During the 2016 Final Hearing, Board staff requested that Sabina outline what measures would be taken to trigger mitigation, as well as what procedures would be in place to initiate adaptive measures related to air quality mitigation. While recognizing Sabina's explanation of the three (3) criteria that would be applied to trigger the use of adaptive management measures, the Board continues to stress the importance of comprehensive mitigation and monitoring to not only address expected air quality challenges, but also to address unforeseen events or trends that could result in unexpected impacts. The Board reiterates that given the likelihood that climatic changes may lead to abnormal, and potentially more extreme, meteorological events, clear contingencies and considerations should be included within all mitigation and monitoring plans to account for such changes.

The Board acknowledges the significant commentary that took place throughout the Review processes and during the Final Hearings between stakeholders, agencies, and Sabina regarding the compound effects that can occur from dust deposition on vegetation, and subsequently on wildlife. The Board notes particular appreciation for the valuable insight provided by government departments and aboriginal groups from the Northwest Territories (NWT) based on their experience with similar industrial developments within their respective jurisdictions. The Board further acknowledges the additional measures incorporated into the Proponent's management plans related to air quality as a result of this commentary following the 2016 Final Hearing.

The Board is in agreement with commentary provided throughout the Review of the Project that for the proper management of dust and air-related issues, consistent consultation and collaboration with Nunavut and NWT stakeholders, agencies, and appropriate regulators alike will be required. In this regard, the Board stresses that mitigation, monitoring, and adaptive management measures should be continuously assessed and refined to ensure the safe and environmentally-protective delivery of the Project throughout all phases.

4.1.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to air quality could be appropriately managed through the commitments provided by the Proponent and the application of key mitigation and monitoring measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Providing an Air Quality Monitoring and Management Plan with updates throughout;
- Demonstrating that the Proponent is responding appropriately to air quality monitoring results, and in particular, that any exceedances are being addressed;
- Updating of dust management and monitoring plans to reflect the Proponent's commitments to employing dust suppression measures and to ensure appropriate response to any unpredicted effects;
- Development of an Incineration Management Plan; and
- Supplying stack testing results to the Board for any temporary or permanent incinerators tested.

4.2 CLIMATE AND METEOROLOGY

4.2.1 Views of the Proponent

Sabina described existing conditions and its effects analysis regarding climate, including climate change and meteorology in Volume 4, Section 3 of the FEIS. Additional details regarding Sabina's baseline meteorological data collection program was provided in Appendix V4-3A: Back River Project – 2004 to 2014 Meteorology Baseline Report. Information pertaining to Greenhouse Gas (GHG) emissions and climate change projections was provided in Volume 4, Section 3.4, and further details were included in Appendix V4-3C: Back River Project – Climate Change Approach Report. Additional information on potential climate change impacts on project infrastructure was included in Volume 9, Section 2. Sabina outlined how it incorporated Traditional Knowledge in the collection of baseline information and climate change observations in Volume 4, Section 3.2.

Using meteorological data collected at the Bathurst Inlet area, near the Marine Laydown Area and the Goose and George Properties, as well as reported from regional meteorological stations, Sabina described the climate in the project area as being typical for arctic regions. As illustrated in the Meteorology Baseline Report, infrequent data gaps exist as a result of limited seasonal access to certain stations for adjustment or repair. Despite noted uncertainties within its climate change models, Sabina highlighted several potential project interactions with climate change impacts, including changes in temperature and precipitation as well as associated potential impacts on permafrost, active layer depth, and snow depth. Sabina considered, based on its emissions analysis, potential project-related greenhouse gas (GHG) emissions to be very small on a national level and insignificant compared to global emissions. No specific Local Study Area or Regional Study Area was identified for the analysis of climate and meteorology in the FEIS; however, data collected and analyzed in the report included both site-specific and regional figures.

Sabina noted that variables measured at the Back River meteorological stations included:

- Air temperature
- Precipitation (rain)
- Precipitation (snow)
- Wind speed, direction and standard deviation
- Relative humidity
- Global radiation

- Barometric pressure
- Evaporation

Using scientific literature, regional climate data, and integrated climate change models, Sabina provided a climate change analysis which included past climate observations as well as predicted climate change scenarios. Sabina noted that Nunavut has been subject to climatic changes and referenced the Arctic Council and International Arctic Science Committee's *Arctic Climate Impact Assessment.* This assessment revealed that between 1950 and 2005, average annual temperatures within the Arctic have risen by two (2) to three (3) degrees Celsius (°C), more than double the Canadian average. It was further noted that these temperature changes, along with increased rainfall, have resulted in changes to sea ice, snow cover, permafrost, evaporation, and sea levels.

Sabina used an integrated multi-modelling approach to predict long term average annual temperature and precipitation trends for the 2020s, 2050s, and 2080s. Sabina predicted that compared to the baseline average annual temperature of -10.6°C reported from 1979 to 2005, air temperature would increase by 0.75%, 1.40%, and 2.00% within the respective year ranges. Compared to the baseline average total annual precipitation of 434 millimetres (mm) reported from 1979 to 2005, Sabina predicted precipitation change to be 6%, 11%, and 16% within the respective year ranges. Sabina acknowledged that although the multi-model approach is preferable to single-model studies for climate predictions, there still exists a level of uncertainty when predicting climatic changes due to the complexity of global climate systems and the uncertainty of future emissions input.

Sabina conducted its GHG emission studies using relevant industry and scientific literature, emission dispersion models, and industry calculation guidelines. The emissions study focused mainly on primary GHGs produced from anthropogenic sources: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). For clarity throughout its study, Sabina presented emissions values as CO_2eq, which it calculated by multiplying each potential emission by its Global Warming Potential.

To calculate and predict direct and indirect GHG emissions resulting from all project phases of the Back River Project, Sabina employed the Mining Association of Canada's Categorization of Emissions Framework:

- Scope 1 emissions – Direct emissions by equipment owned or controlled by the company;
- Scope 2 emissions – Emissions from purchased electricity; and
- Scope 3 emissions – Emissions from related upstream and downstream activities, such as air travel and shipping.

Within its study, Sabina considered diesel fuel combustion (required to power all constructed components, drills, and heavy machinery and other engines) as a Scope 1 emission, and emissions associated with shipping and aircrafts as Scope 3 emissions. It was noted that Scope 2 emissions were omitted from the study because Sabina would not be purchasing electricity from an electrical grid. GHG emissions from diesel fuel combustion were calculated by multiplying the estimated annual fuel needs by the associated combined emission factor for diesel fuel (generated from the *Canada National Inventory Report 1990-2013*). GHG emissions from aircrafts were calculated by multiplying the number of flights per year by the emission factors provided in the Emissions and Dispersion Modeling System version 5.1.4.1, and emissions from shipping were calculated using emission factors provided in the *Canadian 2010 National Marine Emissions Inventory*.

Sabina predicted that total GHG emissions during Year 3 of the Project (considered operational year with highest emissions) would result in the release of 156,456 tonnes CO_2eq. Sabina indicated that yearly project emissions exceeding 50,000 tonnes of CO_2eq would need to be reported as part of Environment Canada's *Greenhouse Gas Emissions Reporting Program*. Emissions during construction and decommissioning periods were predicted to be significantly lower than Year 3 estimates. Sabina committed to employing mitigation and monitoring measures throughout project operations to manage and potentially reduce GHG emissions. Mitigation and monitoring measures included: design optimization; energy efficiency measures; ensuring proper selection, operation, and maintenance of machinery and equipment; recycling and waste management programs; and emission monitoring programs with adaptive management protocols.

In Volume 4.3 of the FEIS Addendum, Sabina provided additional information to address the Board's uncertainty, as expressed in the 2016 Final Hearing Report, with respect to the long-term adequacy of the proposed mitigation of waste rock and tailings storage structures in an Arctic environment in the context of observed and anticipated climate change. Specifically, Sabina commissioned an additional scientific review on the topic from an independent consultant, SRK Consulting Inc. (SRK), and a third-party peer-review of this additional information by Golder Associates Ltd. (Golder). Sabina noted that the additional information presented in the FEIS Addendum did not change its conclusions presented in the Climate and Meteorology assessment of the FEIS (Volume 4, Chapter 3). In the FEIS Addendum, Sabina also reiterated the following objectives for mine closure as originally included in the FEIS (FEIS Volume 10, Chapter 29, Section 1.7):

- Design the mine for closure, through the identification of processes and forces that may act upon the mine components after the mine closure and reclamation so that they can be factored into the design and operation of the mine;
- Mine components that will remain after mine closure will be constructed or modified at closure to be physically stable;
- Mine components, including wastes, remaining after mine closure will be chemically stable;
- All practical efforts will be made to ensure that Project components that remain after closure will not require long-term active care; and
- Reclamation will consider future use and aesthetics, and the site will be compatible with the surrounding lands once reclamation activities have been completed.

Supplemental material included a review from SRK of other current and proposed tailing storage facility and waste rock storage area freeze encapsulation covers in the Canadian Arctic. SRK's review found that the proposed five (5) metre non-potentially acid generating waste rock covers for the Project were "the thickest and most protective freeze encapsulation cover proposed in the Canadian Arctic to date." [73] The review further noted that seasonal active layer thawing under both current and projected climate conditions would be contained within the proposed five (5) metre cover, and thus all encapsulated materials would remain frozen year-round, effectively mitigating the potential for acid rock drainage.

During the 2016 Final Hearing, Indigenous and Northern Affairs Canada (INAC) proposed a term and condition for a revised Closure and Reclamation Plan that would include an adaptive management component with details on the triggers for implementing alternative mitigation options.

[73] Sabina Gold & Silver Corp., Back River Project FEIS Addendum Appendix V4-3D: Climate Change Memo, p. 15.

SRK's new climate change memo provided in the FEIS Addendum included additional details on how monitoring would be conducted, and outlined triggers for adaptive management. SRK's climate change memo specified that monitoring would begin in year two (2) of operations when the first Waste Rock Storage Area is completed, and would continue for 21 years through to closure, and post-closure, and that monitoring would consist of the following:

- Ground temperature cable measurements made throughout the Waste Rock Storage Areas (WRSA);
- Seep surveys and geochemical measurements of waste materials; and
- Local climate variable measurements (e.g., air temperature).

SRK's Climate Change Memo further detailed that monitoring results would be compared to the climate conditions used to inform the project design. It was further noted that this comparison, as well as latest climate change science and projections, would be used to periodically update the thermal modelling to determine if the proposed five (5) metre cover would remain sufficient. The memo further specified that if the thermal modelling were to indicate that the five (5) metre cover was not sufficient in the future, alternative mitigation strategies would be implemented. Sabina also noted in the FEIS Addendum that while not required nor requested, it had additionally committed to retaining an independent and appropriately qualified engineer to annually review the monitoring data.

The Climate Change Memo identified the following additional mitigation steps, noted to be in use at other mines in the Canadian Arctic, that could be implemented if the five (5) metre encapsulation covers as found insufficient:

- Increase the NPAG cover thickness (preferred option);
- Relocate PAG material to exhausted open pits, and cover permanently with water;
- Use a low infiltration geomembrane cover; and
- Capture and treat the affected water to meet water quality standards.

In its third-party review of SRK's Climate Change Memo, Golder agreed that the monitoring program described by SRK, which would include an ongoing review of climate change predictions and of thermal modelling, would be an effective approach to limit uncertainty regarding climate change and the effectiveness of mitigation in the context of climate change beyond 2100.

Sabina concluded in the FEIS Addendum that the proposed monitoring and adaptive management approach would serve to indicate whether the freeze encapsulation cover design requires modification, and would ensure industry leading practices and mitigation measures would be implemented as appropriate. Sabina noted that the additional information presented in the FEIS Addendum would be refined and reviewed during the water licensing process, consistent with the aforementioned term and condition that was recommended by INAC during the 2016 Final Hearing.

4.2.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, the Kitikmeot Inuit Association (KIA) commented on Sabina's Water and Load Balance Report and noted that a robust sensitivity analysis was not a substitute for explicit consideration of climate change. The KIA recommended that Sabina incorporate climate change

as a model input for the water and load balance reports and include discussions on available Intergovernmental Panel on Climate Change scenarios most applicable to the Back River Project and whether the range of predicted climate change effects was captured within the sensitivity analysis. Within its response to the 2016 final written submissions, Sabina noted that while climate change was not included within the water and load balance, it had committed to considering climate change within the designs of the water storage ponds, event ponds, and water diversions. During the 2016 Final Hearing, the KIA noted that this issue was resolved.[74]

Within its 2016 final written submission, Natural Resources Canada (NRCan) commented on Sabina's conclusions that the proposed Tailings Storage Facility (TSF) and permafrost encapsulation would effectively limit seepage from the TSF and potential impacts to water quality. NRCan noted that the results of the thermal analysis for the TSF as presented in the FEIS demonstrated that the tailings would freeze and stay frozen long-term. NRCan recommended that the thermal analysis, TSF design, and closure plans be modified to reflect any new information acquired from site specific investigations conducted during the detailed and final design stage as well as results from monitoring. Sabina agreed with NRCan's recommendations within its response to the 2016 final written submissions.

Similarly, NRCan and Indigenous and Northern Affairs Canada (INAC) discussed the sufficiency of the thickness of the proposed five (5) metre (m) layer of non-acid generating rock to be used to cap the Waste Rock Storage Areas (WRSA) and the TSF in maintaining frozen conditions long-term. NRCan outlined the thermal analysis used and noted that it did include climate change as a parameter and was conservative in using higher than expected temperatures and not considering progressive freezing. NRCan recommended that Sabina implement a monitoring plan to determine the effectiveness of the cover in maintaining frozen conditions and whether additional mitigation measures or adjustments to the closure plan would be required. Sabina agreed with NRCan's recommendations within its response to the 2016 final written submissions and noted that its commitments to monitoring the thermal performance of the WRSAs were described within the Mine Waste Rock Management and Mine Closure and Reclamation plans.

INAC raised concerns that the five (5) m layer cap for the TSF and WRSAs would not be sufficiently robust for the long term storage of tailings, which would be a potential source of contaminant loading to the aquatic environment in the future, post-closure, and in association with potential rising temperatures. INAC discussed Sabina's response to the Department's request for information in which the Proponent outlined additional thermal modelling undertaken that assumed a freeze back of tailings within seven and half (7.5) years, increase of tailings temperature after approximately 25 years, and penetration of the tailings by the active layer after 85 years.[75] INAC noted that the additional thermal modelling undertaken suggested that within seven and a half (7.5) years post-closure and beyond 85 years, potential concerns could include tailings oxidization and contaminant seepage into the environment. INAC disagreed with Sabina's reasons for using an 85 year timeframe for thermal modelling, noting that in all but one (1) of the Intergovernmental Panel on Climate Change scenarios "warming would continue beyond 2100" and that the modelling as presented in the FEIS suggested that impacts could be just starting to develop after 85 years. INAC made similar comments with regards to the modeling and impact prediction for the proposed WRSAs and recommended that Sabina re-examine

[74] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 634-635, lines 26 and 1-5.
[75] Sabina Gold & Silver Corp., Response to Information Requests, February 12, 2016, pp. 188-194.

the design of the TSF and WRSAs to ensure the facilities do not become long-term liabilities post-closure and to provide an analysis of potential residual impacts and identification of appropriate mitigation.

Within its response to the 2016 final written submissions, Sabina noted that it had re-examined the design of the TSF and the WRSAs and concluded that they were appropriate and would not result in a long-term liability beyond what has been assessed. Sabina further noted that it was confident that suitable mitigation measures had been presented. Sabina expounded upon its assessment in the FEIS with regards to climate change and the climate change scenarios presented in the IPCC. Sabina stated that climate change projections beyond 2100 are not as well understood as those up to 2100 and that Environment and Climate Change Canada's (ECCC) website presents climate change information up to the year 2100 only. Sabina concluded that "it is not reasonable, it is not possible to run the thermal modeling prediction to a point of equilibrium or steady state as suggested by INAC". Sabina re-iterated that it would monitor the freezing performance of the TSF and WRSAs pursuant to its Mine Waste Rock Management Plan.

During the 2016 Final Hearing, INAC clarified its statements with regards to its submission as discussed above, noting that it agreed with the data presented in the model and that it was a conservative model. Using the model generated data, INAC discussed the potential for the active layer to reach the critical depth of five (5) m and result in potential impacts for both the TSF and WRSAs. INAC raised concerns regarding the long-term viability of the sites, re-iterating that the "*thermal modelling suggests the potential for long-term impacts specifically at the end of the modelling period used by Sabina*".[76] INAC further stated that "*we believe that climate change uncertainty should not be used as a basis to constrain the impact analysis. The precautionary principle should have been applied in this case*."[77] INAC concluded that the potential for long-term impacts associated with the TSF and WRSAs were not sufficiently assessed and that the significance of the conclusions is unknown. INAC recommended that a strategy be developed outlining the most appropriate mitigation options and timing of implementation. INAC encouraged Sabina to undertake a pilot wasterock and/or tailings containment program to determine the effectiveness of the proposed design. Sabina noted that through discussions with INAC it had committed to revising its Closure and Reclamation Plan to include an adaptive management component with details on the triggers for implementing alternative mitigation options, which would be submitted to the Nunavut Water Board during the water licence application process.[78]

In association with the discussion noted above, ECCC discussed national initiatives on climate change in a deferred response and noted plans to develop a Pan Canadian framework related to clean growth and climate change by the end of 2016 in association with Canada recently signing the Paris Agreement on climate change. ECCC further acknowledged that Sabina had assessed potential project-related greenhouse gas emissions and was aware of associated reporting requirements pursuant to the *Canadian Environmental Protection Act*. Facilities in Canada that emit over 50,000 tonnes of carbon dioxide equivalent are required to report emissions to ECCC for the greenhouse gas emissions program

[76] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 566, lines 17-19.
[77] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 566-567, lines 26 and 1-3.
[78] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 579-580, lines 26 and 1-10.

identified under Section 64 of the *Canadian Environmental Protection Act*.[79] Based on information provided by its Department's permafrost experts, NRCan confirmed that permafrost conditions have generally been changing in Nunavut as a result of climate change, which could result in thinning or even disappearing permafrost. Projections of increase in the active layer depth were noted to range from zero percent (0%) to more than 50% over the next 50 years. It was further noted that permafrost conditions in Canada are being monitored and multiple studies have been conducted at the territorial, national, and international level on permafrost climate interactions and permafrost response to climate warming.[80] The Nunavut Climate Change Centre was developed by the Government of Nunavut and is collaborating with NRCan and 10 Nunavut communities to install permafrost monitoring sites across Nunavut as part of the Nunavut permafrost monitoring network.

Comments were received by many Community Representatives on observations of changing climate and potential associated project-related impacts. A Community Representative of Cambridge Bay noted that:

> *The climate plays a major role in a lot of things that we are doing. Spring is coming earlier, fall is coming later. Ice thickness and the salinity in the water as is right now is at a certain level. That is depleting to a certain degree.* [81]

Concerns were raised regarding the proposed winter ice road and whether the temperatures each year would be low enough to support ice conditions required for transport. Sabina noted that its vehicles would generally require less than one (1) metre of ice to operate full loads and ice conditions along the proposed route would typically reach three (3) or more metres. Samples to test the ice thickness would be taken prior to opening the road and methods to build up the ice could include pumping water to freeze over the proposed route. Sabina noted that it would monitor ice thickness throughout the season to ensure safe operations and if ice does not reach minimum thickness alternative measures could include reducing truck loads.[82] Sabina further stated that:

> *…we actually don't have too much concern on this. We agree ice thickness can vary, but generally the ice is extremely thick, and where other projects like the diamond projects have had problems, that usually relates to the southern portions of their roads, like, near Yellowknife becoming too thin too fast, and we're much further north. So we're confident -- we need that equipment; we need that stuff to run the mine. So it's, like, the life of the project. So we have to make sure we plan it out properly.* [83]

Environment and Climate Change Canada (ECCC) stated within its final written submission on the FEIS Addendum that it had reviewed the new content provided by Sabina in Volume 4 of the FEIS Addendum

[79] L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 743-745, lines 24-26, 1-26, and 1-7.
[80] R. Besner, Natural Resources Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1261-1263, lines 21-26, 1-26, and 1-9.
[81] H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1016, lines 7-10.
[82] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 993-995, lines 10-26, 1-26, and 1-3.
[83] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 994-995, lines 18-26 and 1-2.

and had no additional comments or recommendations. ECCC did not provide additional comments during the supplemental Final Hearing.

Indigenous and Northern Affairs Canada (INAC) indicated within its final written submission on the FEIS Addendum that the new adaptive management plan contained within Sabina's Climate Change Memo, including proposed triggers and alternative mitigation options, increased its confidence in the company's ability to manage, detect, and mitigate potential effects, and was of sufficient detail for the impact assessment stage. INAC further acknowledged the adaptive management plan met the requirements of a term and condition proposed during the 2016 Final Hearing, and if monitoring were to indicate that the five (5) metre encapsulation cover on the Tailings Storage Facility (TSF) and Waste Rock Storage Facility (WRSF) were insufficient, the additional mitigation step(s) proposed by Sabina was reasonable. INAC also supported Sabina's commitment to continually update thermal modeling in response to new monitoring data and new climate change predictions as well as conduct regular, independent geotechnical inspections to further reduce uncertainty. As a result of the additional commitments, INAC concluded that it had no outstanding concerns related to the consideration of climate change issues in regards to TSF and WRSF monitoring, mitigation, and management, assuming that additional detail is provided during the water licensing phase, but did note that monitoring should to be carried out for a minimum of 21 years. In its response to INAC's final written submissions on the FEIS Addendum, Sabina agreed to engage in discussions with regulators regarding TSF monitoring beyond the proposed 21 years, acknowledging that this would be consistent with an adaptive management approach. INAC confirmed during the supplemental Final Hearing that the information provided by Sabina in the FEIS Addendum included sufficient assurances that appropriate management measures would address the department's initial concerns and it was confident the potential for impacts were sufficiently reduced, provided the commitments agreed to by the Proponent are adequately implemented.[84]

Within its final written submission on the FEIS Addendum, Natural Resources Canada (NRCan) reiterated its satisfaction with Sabina's proposed monitoring, mitigation, and management plans as presented in the FEIS. NRCan further indicated that it supported Sabina's conclusions offered in the FEIS Addendum. NRCan agreed that the proposed five (5) metre WRSF and TSF cover thickness was conservative and followed best practices in the Canadian Arctic. NRCan stated that Sabina's proposed monitoring and mitigation would address any uncertainty regarding long-term climate change because it is not a static analysis and would allow for adaptive management. NRCan concluded that it had no outstanding questions or concerns, provided Sabina implement its proposed monitoring program and incorporate the new information in ongoing thermal analysis. In its response to the final written submission on the FEIS Addendum, Sabina confirmed it would carry out the proposed monitoring plan as outlined in FEIS Addendum (Appendix V4-3D) and would update thermal modelling to informal final closure plans for the WRSAs and TSF. NRCan did not raise any additional issues or concerns during the supplemental Final Hearing and concluded during its technical presentation that the proposed commitments, monitoring, and mitigation plans would ensure minimization of impacts from the Project.[85]

Following NRCan's technical presentation at the supplemental Final Hearing, NIRB staff asked NRCan to clarify whether best practices would be sufficient to ensure frozen conditions are maintained until the

[84] R. Theoret-Gosselin, Indigenous and Northern Affairs Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 528, lines 15-25.

[85] R. Besner, Natural Resources Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 571, lines 2-5.

year 2100, as indicated by the Proponent. NRCan confirmed this would be sufficient.[86] Sabina confirmed in follow-up that its analysis indicated frozen conditions would be maintained up to and beyond 2100, and reiterated that the year 2100 was used as an end date in its current analysis as climate change models widely diverge beyond that time as a result of the number of assumptions required in the model. Sabina clarified that it would use monitoring data and the latest climate change science to continually revise and evaluate its model.[87]

During the supplemental Final Hearing, NRCan was asked by a Community Representative from Kugluktuk whether Inuit Qaujimajatuqangit had been considered as expert knowledge in the studies on permafrost and climate change. NRCan was uncertain and unable to provide clarification.[88]

Also during the supplemental Final Hearing, a Community Representative from Kugluktuk indicated that climate change is an increasingly important consideration in the area, causing erosion and other impacts on the land. The representative expressed satisfaction with Sabina's attention to climate change in the supplemental Final Hearing.[89]

Lastly, a Community Representative from Taloyoak asked Sabina during the supplemental Final Hearing if it had considered sources of power other than gas or fuel. Sabina responded that while diesel fuel is currently the standard source of energy across the north, alternative energy sources such as wind and solar were considered. Sabina mentioned familiarity with the wind farms at the Diavik Diamond Mine and the Raglan Mine in the north, and the need to store alternative energy sources like this using batteries, but expressed that the technology still needs improvement. Sabina noted it would continue to investigate options [if] the Project moves forward. [90]

4.2.3 Views of the Board

In the 2016 Final Hearing Report, the Board indicated that it shared the views of Parties that meteorological events such as high winds and waves, severe fog or white out conditions, and extreme temperature or precipitation events have the potential to create significant challenges for the Proponent, in that operations may be disrupted or infrastructure may be physically damaged. In addition, potential changes to the timing of ice formation, ice thickness, active layer thickness, frequency of storms, and wildlife habitat alterations also pose related challenges.

During the 2016 Final Hearing, the Board questioned the Government of the Northwest Territories (GNWT) on its experience with winter ice roads and any observed effects resulting from changes in climate. The GNWT representatives noted that through general observation, the winter ice road season

[86] R. Besner, Natural Resources Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 574, line 8.
[87] M. Rykaart, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 574-575, lines 17-26 and 1-18.
[88] R. Besner, Natural Resources Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1009, lines 8-10.
[89] P. Taktogon, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 677, lines 1-8.
[90] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 706-707, lines 20-26, 1-17.

has been decreasing and has resulted in shorter transport seasons as the ice in areas has not been thick enough for large trucks.[91] For additional discussion see Section 6.2.2: Accidents and Malfunctions.

Of particular concern to the Board in 2016 was the issue brought up through discussions between federal departments and Sabina regarding the proposed remediation measures for the tailings storage and waste rock areas and their potential future interactions with the seasonal active layer should changes in climatic conditions continue as predicted. During the 2016 Final Hearing, the Board questioned Sabina on whether it would apply adaptive management to its model and reclamation plans if climatic conditions were to change in the future (e.g., in 20 years). Sabina clarified that to verify its predictions it would close off certain facilities and conduct tests to assess whether freeze back is occurring and would apply adaptive management measures if required.[92] In the 2016 Final Hearing Report, the Board expressed uncertainty over whether the proposed mitigation and monitoring measures, such as the application of a rock cover limited to five (5) metres, would effectively mitigate impacts that could result from climate change on the tailings and waste rock storage areas.

Within the 2016 Final Hearing Report, the Board expressed concerns that due to the potential for changing climatic conditions within the project area, the covered tailings and support structures may interact with the seasonal active layer sooner and more consistently than predicted. As a result, the Board concluded in 2016 that it was not confident that the mitigation, monitoring, and adaptive management measures as proposed would be sufficient to mitigate effects related to climate change on tailings and waste rock storage areas.

The Board acknowledges the additional information regarding climate change provided by Sabina in the FEIS Addendum, including a comparison of tailings storage structures across the Canadian Arctic, and the identification of an adaptive management strategy with triggers and alternative mitigation options. The Board further notes a new commitment by Sabina to produce an independent, third-party geotechnical inspection report and review of the associated monitoring data.

At the supplemental Final Hearing, a Board member asked Sabina to clarify how waste rock would be encapsulated in the permafrost.[93] Sabina explained in response that a proposed cover of non-potentially acid generating waste rock of at least five (5) metres would be used for both Waste Rock Storage Areas (WRSAs) as well as the Tailings Storage Facility (TSF). Sabina clarified that the cover would ensure that neither water nor air would access the "bad rock" within the WRSA and TSF[94] and further discussed this topic during its technical presentation, noting the new Climate Change Memo and third party review provided in the FEIS Addendum.[95]

During the supplemental Final Hearing, a Board member asked INAC to clarify whether the recommendation to monitoring for a minimum of 21-years refers to 21 years from the beginning of

[91] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1265-1267, lines 20-26, 1-26, and 1.
[92] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1222, lines 8-21.
[93] P. (Omingmakyok) Kadlun, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 85, lines 9-11.
[94] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 85, lines 15-26.
[95] Sabina Gold & Silver Corp., Exhibit 13, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017.

operations, or 21 years after closure.[96] In response, INAC indicated that if monitoring suggests a trend during those 21 years, it would be important to continue the monitoring beyond the 21 years.[97] Sabina clarified that the 21 years represents the total projected life of the mine from construction through to post-closure.[98]

With the additional information provided by Sabina in the FEIS Addendum and during the supplemental Final Hearing, as well as by Parties, the Board is now satisfied with the degree to which the Proponent has accounted for the possible impacts of interactions between the Project and a changing climate and is of the view that mitigation measures related to tailings containment would be adequate or could be adequately adapted under variable climatic conditions. 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 continue to evolve; therefore, the Proponent needs to remain committed to revising and updating current information, operational procedures, plans, and predictions to account for any relative variations and changes that had not been anticipated.

The Board acknowledges that some Inuit Qaujimajatuqangit was considered along with scientific knowledge and climate data trends to form components of Sabina's assessment of climate and meteorology. The Board would like to encourage the Proponent to carry this knowledge over to the next stage of planning and continue to use Inuit Qaujimajatuqangit in its design stage and through the finalization of plans.

4.2.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board expressed uncertainty regarding the effectiveness of the Proponent's proposed Tailings Storage Facility in the context of climate change. Following a review of the new material presented by Sabina in the FEIS Addendum and the supplemental Final Hearing as well as the updated views of Parties, the Board believes that the Project's potential effects related to climate and meteorology could be appropriately managed through the commitments provided by the Proponent and application of mitigation measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Maintaining a Greenhouse Gas Emissions (GHG) Reduction Plan to track emissions and demonstrate mitigation is appropriately managing effects of the Project;
- Maintaining a Mine Closure and Reclamation Plan to: identify the processes that may act upon the mine components after closure and reclamation so that they can be factored within the design and operation of the mine; ensure physical and chemical stability of mine components that remain after closure; ensure mine components that remain after closure will not require long-term active care; and consider future use and aesthetics of the area with the surrounding lands; and

[96] A. Maghagak, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 1009-1010, lines 22-26 and 1-6.
[97] M. Lupp, Indigenous and Northern Affairs Canada. NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1010, lines 18-26.
[98] M. Rykaart, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1011, lines 7-15.

- Provide a report of meteorological conditions experienced within the project area and highlight extreme or outlying weather events.

4.3 NOISE AND VIBRATION

4.3.1 Views of the Proponent

Sabina presented its assessment of potential project-induced impacts from noise and vibration in Volume 4, Section 2 of the FEIS. Information pertaining to Sabina's baseline noise studies was provided in Appendix V4-2A: Back River Project – 2012 Noise Baseline Report. Information on how Sabina incorporated Traditional Knowledge into its effects assessment of noise and vibration was provided in Volume 4, Section 2.2. Sabina noted that the existing noise and vibration environment in the project area, not including the existing exploration camp, was considered pristine and, pursuant to provincial standards, was categorized as a quiet rural area. Following a review of potential project interactions with noise and vibration, Sabina identified nine (9) potential effects and three (3) potential residual effects. The three (3) predicted potential residual effects were: sleep disturbance to humans and habitat loss and disturbance regarding wildlife. Sabina predicted that through the implementation of proposed mitigation measures included in its noise and vibration-related management plans (Volume 10 of the FEIS), the predicted residual effect as relates to human receptors would be not significant, and would not result in any cumulative or transboundary effects. For more information on Sabina's noise related effects assessment as pertains to wildlife, including potential residual, cumulative, and transboundary effects, see Section 4.10: Terrestrial Wildlife and Wildlife Habitat.

Sabina identified the following three (3) general spatial boundaries for its assessment of potential project-induced impacts to noise and vibration:

- *Proposed Development Area* (PDA) — Includes the project footprint (areas of physical disturbance at the Goose Property and Marine Laydown Area (MLA)), plus a 'buffer area'.
- *Local Study Area* (LSA) — The area where there is a reasonable expectation of immediate impacts from the Project.
    - *Goose Property LSA* – Includes the PDA in addition to a 10 kilometre (km) buffer zone.
    - Marine Laydown Area LSA – Includes the PDA in addition to a 10 km buffer zone.
- *Regional Study Area* (RSA) — A broader area where there is a potential for direct, indirect or cumulative environmental impacts. The RSA includes the PDA and the LSA plus a buffer of at least 10 km from the LSAs.

Sabina qualified the use of 10 km buffer zones by noting that similar studies in the north have detected project-related noise during calm conditions from distances up 10 km from the source. Sabina also noted that spatial RSA boundaries were established to coincide with the terrestrial wildlife RSAs. The temporal boundaries in Sabina's assessment of project-induced noise and vibration effects aligned with all project phases, including mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

For the purpose of modelling a 'worst case' noise emission scenario, Sabina predicted that the highest number of mobile and fixed equipment units would be in use during Year 3 of operations at the Goose Property, and thus selected this year and location as the focus of its noise emission study. Sabina

reasoned that if noise emissions during the peak year were found to be not significant, then potential effects from the entirety of the Project should also be not significant. For this reason, Sabina also noted that the MLA was not included in the quantitative noise modeling.

In its review of potential project interactions with noise and vibration, Sabina identified the following nine (9) indicators for analysis, developed from professional judgement, current best practice, and provincial and federal guidance standards:

- Effects on humans:
    - sleep disturbance;
    - interference with speech communication;
    - complaints;
    - high annoyance;
    - noise induced rattling;
    - noise induced hearing loss; and
    - cosmetic and structural damage to buildings from vibration.
- Effects on wildlife:
    - loss of wildlife habitat; and
    - disturbance to wildlife.

Sabina conducted noise modelling for the Goose Property to predict potential noise effects on sensitive human and wildlife receptors identified in the study. Activities considered within the model included fixed plant components, mobile equipment, blasting and explosives, and aircraft flights. Sabina predicted, based on the quantitative noise modelling, that noise levels for Year 3 would be below the criteria for interference with speech communications, complaints, high annoyance, and noise induced rattling and hearing loss. Sabina also noted that that it would not expect any cosmetic or structural damage of buildings from project-generated vibration. Using the results of the noise modelling study, Sabina concluded that the potential residual effects resulting from predicted noise levels exceeding relevant criteria would include wildlife loss of habitat and disturbance, as well as human sleep disturbance at the proposed location of the Goose camp.

Sabina highlighted specific measures for the mitigation of sound and vibration effects resulting from the Project, including: design optimization for roads, structures, and placement of operational sites; proper maintenance and application of sound dampening modifications on equipment; limiting sound-intensive activities to certain times of the day; utilizing acoustic screens and berms where appropriate; and employing specific sound monitoring programs with associated adaptive management protocols.

Sabina determined, contingent on the application of mitigation measures, that the predicted residual effect of sleep disturbance on humans would be not significant, as the effect would be reversible, of moderate magnitude, sporadic, and would be limited to the project footprint. In addition, Sabina conducted a cumulative and transboundary effects assessment and determined that due to the localized phenomena of the predicted residual human effect (confined to the project footprint), no projects were identified within the spatial boundary of the assessment. Consequently, it was noted that no cumulative

effects would be expected. Sabina provided additional information pertaining to the predicted residual effects of noise and vibration on humans in Volume 8, Section 6 of the FEIS.
No specific section was added to the Final Environmental Impact Statement Addendum related to noise and vibration.

4.3.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, the Government of Nunavut and other parties raised concerns with regards to noise and vibration modelling associated with potential impacts on wildlife, and caribou specifically. During the 2016 Final Hearing, parties, including Community Representatives, raised questions and concerns on the potential impacts from project-induced noise and vibrations on wildlife, fish, and marine wildlife (see sections 4.11: Terrestrial Wildlife and Wildlife Habitat, 4.9: Freshwater Aquatic Environment, and 4.14: Marine Wildlife).

4.3.3 Views of the Board

During the 2016 Final Hearing, the Board noted multiple concerns expressed by parties and Community Representatives with regards to the effects of potential project-induced noise and vibrations on fish, wildlife, marine wildlife, and human health and safety. The Board questioned Sabina on its proposed mitigation measures to reduce noise associated with the proposed camp and mining operations and whether those measures conformed to best practices. In response, Sabina outlined its proposed noise mitigation measures, including enclosing the generator sets, crushers, and grinding mills within buildings and employing mufflers or silencers on equipment. Sabina suggested that the main sources of noise (generator sets, processing plant, crushers, mills, and equipment) and associated mitigation measures were used to construct its noise model and to predict and measure effects. The Board also raised questions during the 2016 Final Hearing on whether project-generated noise during the night would impact people in the vicinity of the mine site (e.g., a camp 100 miles away). Sabina responded that noise generation would be a continuous 24 hours per day and that noise abatement measures would not differ by time of day:

> *I mean, for -- for workers, you're trying to keep the camp a little bit further away from things like the gen set or the process plant so that they sleep better and that type of thing. But there isn't anything additional I would say that you would do for night other than something like that*.[99]

Sabina further clarified that the closest known cabin to project infrastructure was located three (3) kilometres from the Marine Laydown Area (MLA), and the proposed operations at the MLA would not be continuous and natural features such as a 'large hill' separate the MLA and the cabin. Sabina stated that the closest community was identified as Kingaok (Bathurst Inlet), approximately 30 kilometres from the Project.[100]

In 2016, the Board concluded that it was concerned with the potential for adverse effects related to noise and vibration. The FEIS Addendum did not contain additional information or comments on the potential for the Back River project to result in negative impacts to noise and vibration, nor was there

[99] W. Carson, Sabina Gold & Silver Corp., NIRB Final Hearing No. 12MN036 Transcript, April 25, 2016, p. 105, lines 11-16.
[100] M. Pickard, Sabina Gold & Silver Corp., NIRB Final Hearing No. 12MN036 Transcript, April 25, 2016, pp. 105-106, lines 20-26 and 1-8.

significant additional discussion at the supplemental Final Hearing on this matter. As a result of discussions at the 2016 Final Hearing and consideration for specific mitigation which can be applied, the Board continues to stress the importance of implementing noise reduction measures if the project proceeds, and ongoing monitoring will be required to ensure the effectiveness of those measures.

4.3.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board is providing mitigation measures to manage potential impacts as related to noise and vibration (see sections 4.11: Terrestrial Wildlife and Wildlife Habitat, 4.9: Freshwater Aquatic Environment, and 4.14: Marine Wildlife for discussion of noise and vibration on other receptors). Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Demonstrating considerations for noise reduction measures through siting and design of the project infrastructure at the Goose property and Marine Laydown Area, and monitor the camps to ensure that noise levels remain within reasonable limits; and
- Demonstrating mitigation of noise generated by project activities that would remain operational during staged reduction events.

4.4 TERRESTRIAL ENVIRONMENT

4.4.1 Views of the Proponent

Sabina provided information pertaining to potential project interactions with the terrestrial environment in Volume 5 of the FEIS, focusing specifically on permafrost, landforms, special landscape features, and soils in sections 2 and 3, respectively. Additional information pertaining to baseline permafrost studies, as well as terrain and soil studies, was provided in the FEIS in Volume 5 Appendix V5-2A: Back River Project— Cumulative Permafrost Baseline Data Report, Appendix V5-3B: Back River Project— 2013 Terrain Maps, Appendix V5-3A: Back River Project— 2012 Terrain and Soils Baseline Report, and through a data sharing agreement with the Glencore Canada Corporation, Appendix V5-2C: 2012 to 2013 Thermistor String Records Obtained at the Hackett River Project. Sabina predicted that a variety of project components and activities would interact with permafrost throughout the duration of the Project and provided permafrost mitigation measures throughout Volume 10 of the FEIS. Sabina concluded that potential project-related impacts would occur to soil primarily during the closure and post-closure phases of the Back River Project, and estimated that approximately 541 hectares (ha) within the Potential Development Areas (PDA) would be impacted by residual soil loss. In addition, it was noted that natural permafrost degradation is predicted to occur as a result of the estimated temperature increase of 5.3°C in the Goose Property area over the next century.

Sabina identified the following two (2) general spatial assessment boundaries for its effects assessment on the terrestrial environment:

- *Local Study Area (LSA)*: Includes the Goose Property and Marine Laydown Area (MLA) PDAs, the winter ice roads connecting the Goose and MLA PDAs, and a buffer of one (1) to one and one half (1.5) kilometres (km) around all proposed infrastructure for a total of 1,344 square

kilometres (km^2).

- *Regional Study Area (RSA): I*ncludes the LSA in addition to a 35 km buffer around all proposed infrastructure for a total of 12,620 km^2.

For select terrestrial environment studies, Sabina noted that it had considered results from studies conducted in the Goose Property PDA to be representative of conditions throughout the entire LSA and RSA. Sabina aligned the temporal boundaries for the terrestrial environment effects assessment with the project phases used throughout the FEIS, which include the mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

Permafrost

For its analysis of potential project interactions with permafrost, Sabina provided information on site-specific investigations as well as information drawn from permafrost studies conducted in similar settings as the Back River Project.

Using a thermistor string and test pit studies, Sabina estimated the permafrost extent in the Goose Property PDA to be approximately 500 metres (m) thick, with a seasonal active layer ranging from 1.3 to 4.34 m below ground surface. Sabina also used relevant scientific literature, in addition to one and two-dimensional analytical geothermal models, to interpret open, closed, and through talik extents for waterbodies within five (5) kilometres (km) of the Goose Property PDA. Sabina predicted, based on these studies, the existence of numerous taliks under waterbodies with depths greater than 1.3 m. Sabina further predicted the presence of cryopegs at the base of open taliks based on the discovery of hyper-saline groundwater at the nearby Phase 2 Hope Bay Belt Project (see Section 4.6: Hydrological Features and Hydrogeology). Sabina suggested that permafrost conditions within the MLA and winter ice road corridors would be the same as at the Goose Property PDA, with the potential of a deeper active layer outside of the MLA during summer months due to increased rainfall.

Sabina indicated that the Back River Project would interact with permafrost in areas where excavation, landfilling, and changes to ground thermal conditions would occur; these components included:

- Open pits and underground mines;
- Tailings Storage Facility (TSF);
- Waste rock storage areas (WRSA);
- Roads;
- Water management infrastructure; and
- Buildings.

Using a two-dimensional heat conduction model, Sabina predicted permafrost behaviour resulting from the components noted above. Although thawing beneath the TSF was estimated to extend to 21 m after 10 years, it would not be expected to impact the structural or operational performance of the TSF dam. Sabina further indicated that following the operation of the TSF, progressive cooling and permafrost aggradation would be expected to initially occur through dam and foundation materials, and later through materials stored in the TSF.

Sabina noted that pits and underground mines would not be expected to thaw permafrost during the operational phase, as local subsurface temperatures would be expected to persist within the proposed

underground mines. Sabina indicated, however, that open pits would expose deeper frozen bedrock to ambient air temperatures, likely resulting in the development of active layers with annual freeze/thaw cycles. Sabina also predicted that flooding of the Goose, Echo, and Umwelt pits at closure would result in the development of taliks beneath each pit. Sabina indicated that permafrost aggradation would be expected to occur within and beneath earth-fill structures (e.g., WRSAs and roadbeds) and that thermal protection measures would be employed to minimize permafrost degradation under heat producing structures/components.

Landforms and Soils

Sabina discussed potential project-induced impacts to soil and terrain within the Project's PDAs, including soil erosion, soil compaction, and other soil-related components of concern. Sabina noted its design objective to minimize project impacts on local landforms and soils, especially in areas of high ice content, permafrost, and sensitive surficial deposits. In its assessment, Sabina stated that the total area of the Goose Property and MLA PDAs (6,080 ha) would be considered lost from the time of project construction to its closure, but that residual soil loss would only be expected within areas of the maximum project footprint, estimated at 541 ha. Within this footprint, Sabina estimated that 76.5% of the total residual impacts to soil would be on morainal and glaciofluvial soil types. Sabina noted that colluvium, weathered bedrock, eolian, bedrock, and marine deposits would be expected to display relatively low sensitivity to surface disturbance, while organic surficial deposits and riparian zones would likely exhibit high susceptibility to surface disturbance, potentially resulting in permafrost or ice lens degradation. Sabina added that based on relevant scientific literature, glaciofluvial deposits located in the region may contain massive ice cores that could be impacted through the disturbance of associated mineral materials.

Sabina focussed its assessment of potential project-induced soil erosion on the Project's closure phase, as it assumed that entire areas within the PDAs would be lost for the duration of the Project's operational life. Sabina noted that the LSA has approximately 29% of soils characterized by low erosion potential, 38% by moderate erosion potential, and 33% by high erosion potential. In its assessment, Sabina suggested that newly decommissioned/reclaimed areas where soils had been disturbed, or were void of vegetation, would potentially experience wind erosion and could introduce dust and sediment into waterways. Sabina further highlighted that exposed mineral soils are sensitive to water erosion during seasonal thaw and rain events when stockpiled or exposed during excavation. Sabina noted that areas dominated by bedrock and glaciofluvial deposits exhibit relatively low erosion potential and that morainal material, especially when disturbed on slopes great than 5% or stockpiled, display generally higher erosion potential. Sabina indicated that streams within the LSA are generally well protected against current levels of stream bank erosion and that construction work in riparian zones would only temporarily increase erosion potential. Sabina discussed natural mitigation measures from existing land formation, and provided details on its soil erosion and spill-related mitigation measures in its Site Water Monitoring and Management, Spill Contingency, and Mine Closure and Reclamation plans, available in Volume 10.

Sabina assessed the potential effects of project activities on soil compaction during the closure and post-closure phases only, as it assumed that areas within the PDAs would be lost during the Project's operational life. Sabina noted that soil disturbance leading to soil compaction is expected only within the PDAs, largely from machinery traffic during the closure phase. Sabina noted that areas dominated by bedrock and glaciofluvial deposits would be expected to exhibit relatively low susceptibility to compaction, while wetlands and tundra located in lower topographic positions (e.g., lower slopes, slope toes, depressions, and valley floors) would be most vulnerable. Sabina highlighted that it realigned the

proposed winter ice road north of Tahikafflok Lake (Bathurst Lake) to the MLA as a measure to address potential impacts to riparian zones as identified during two (2) local focus group workshops conducted in Cambridge Bay and Kugluktuk.

Outside of arsenic exceedances detected at select sample sites, Sabina noted that in general, soil metal concentrations in the LSA do not exceed Canadian Council of Ministers of the Environment (CCME) guidelines. Sabina further noted that dust deposition, except for acid deposition exceedances, would be expected to remain below objectives and/or standards and that dust deposition, including acid deposition, would be contained within both the Goose Property and MLA PDAs as predicted by modelling studies (see Section 4.1: Air Quality).

No specific section was added to the Final Environmental Impact Statement Addendum related to terrestrial environment.

4.4.2 Views and Concerns of Interested Parties

During the 2016 Final Hearing, a Community Representative from Kugaaruk raised questions regarding the type of material to be used to construct the berms for the proposed fuel tank farm, noting the potential for soil to crack during seasonal freeze and thaw cycles. In response, Sabina described the proposed construction of the fuel storage areas and outlined that that blasting would be conducted on the surface materials into the bedrock or permafrost and that materials such as gravel would be used that would not affect or be affected by permafrost movement. It was further noted that all berms would be lined, approved by engineers, and regularly inspected by on-site staff as well as by the Kitikmeot Inuit Association and Indigenous and Northern Affairs Canada during site inspections.[101] For additional information related to potential spills, see Section 6.2: Accidents and Malfunctions Assessment.

A Community Representative from Kingaok (Bathurst Inlet) commented on potential project-induced impacts to the Marine Laydown Area (MLA) post-closure and asked Sabina how confident it was in restoring the land comprising the MLA and what the use of the area would be post-project. Sabina responded that pursuant to its closure plans, all infrastructure including buildings, dock, and fuel tanks would be removed from site and shipped south; only aggregate used for the pads and site roads would remain on-site, which would be verified as chemically and physically stable to mitigate potential effects to fish or wildlife. Sabina clarified that it proposes to completely remediate the site and that the KIA would hold the bond to ensure remediation was satisfactorily undertaken.[102]

4.4.3 Views of the Board

In the 2016 Final Hearing Report, the Board acknowledged Sabina's commitment to mitigate, monitor, and adaptively manage impacts to landforms and soils throughout the duration of the Project, and agrees that measures as proposed are satisfactory at this stage of the Project's development. The Board noted, however, concerns regarding the potential for changing climatic conditions and project components to affect permafrost conditions that could significantly impact the surrounding

[101] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 996-998, lines 3-16, 1-26, and 1-2.
[102] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1020-1021, 16-26 and 1-23.

environment. As changing climatic conditions have the potential to impact the terrestrial environment in unexpected ways, the Board stressed the importance of diligent mitigation and rigorous monitoring to ensure that all potential effects are forecasted and adaptively managed. The Board noted that failure to maintain the integrity of the terrestrial environment throughout the Project could result in significant residual impacts to soil, water, vegetation, and wildlife in the area. For more information on discussions related to climate change and permafrost, refer to Section 4.2: Climate and Meteorology.

In the 2016 Final Hearing Report, the Board highlighted the importance of Inuit Qaujimaningit related to the terrestrial environment and noted appreciation for the community consultation conducted by the Proponent, which led to the relocation of the proposed winter ice road north of Tahikafflok Lake as a measure to address potential impacts to riparian zones. The Board also remarked that the beauty and importance of the natural topography and landscape, as perceived by the people with connections to the project area, deserves consideration throughout the life of the Project. Topographical features may be used by Inuit and other travellers as landmarks in navigating across the tundra and changes to that landscape should be considered by Sabina.

In the 2016 Final Hearing Report, the Board emphasized the importance of thorough and progressive site remediation. The Board noted that it agreed with Community Representatives that also expressed this sentiment during the 2016 Final Hearing, and the Board further expressed support for the Kitikmeot Inuit Association's comprehensive expectations with regards to appropriate site remediation measures.

The FEIS Addendum contained no additional information or comments on impacts of the Back River Project to the terrestrial environment, and discussion at the supplemental Final Hearing focused around specific valued ecosystem components related to this topic, as captured in the respective sections. The Board maintains its view that thorough and progressive site remediation is of the utmost importance.

4.4.4 Conclusions and Recommendations of the Board

The Board notes consistency in the views of the Proponent and Parties related to the terrestrial envrionment during both the 2016 and supplemental Final Hearings. In considering these views throughout the assessment of the Project and as outlined above, in 2017 the Board maintains the belief that the Project's potential effects to the terrestrial environment could be appropriately managed through the commitments provided by the Proponent, including the undertaking of additional thermal modelling and geotechnical investigations to identify sensitive landforms and inform design of planned infrastructure and mitigation and monitoring measures (see Section 4.2: Climate and Meteorology, and Section 4.5: Geological Features, Surficial and Bedrock Geology, and Geochemistry). Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8 : Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Conduct further permafrost mapping to document permafrost temperature, thickness of seasonal thaw and amount of ground ice in the project development area;
- Monitor the effects of the Project on permafrost conditions, and report on measures implemented to restore and promote permafrost integrity if applicable;

- Undertake additional geotechnical investigations as required to identify sensitive landforms, modify engineering design for project infrastructure, and develop and implement mitigation and monitoring measures;
- Provide a Waste Management Plan that describes how the local environment, including permafrost integrity and water quality, will not be harmed by wastes at project landfills; and
- Maintain a progressive reclamation plan to detail the infrastructure to undergo remediation during operations, specifically detailing methodologies and Inuit Qaujimajatuqangit considered in planning the remediation activities, and adaptive management strategies to be implemented related to relevant triggers.

4.5 GEOLOGICAL FEATURES, SURFICIAL AND BEDROCK GEOLOGY AND GEOCHEMISTRY

4.5.1 Views of the Proponent

Sabina provided information pertaining to the geological environment in Volume 5, Section 1 of the FEIS and information concerning potential geotechnical hazards in Volume 9, sections 2.2 and 2.3. Sabina indicated that additional information concerning the geology of the proposed project was provided within its feasibility study, as well as in Appendix V11-4A: Back River Project— 2007 to 2012 Metal Leaching/Acid Rock Drainage Baseline Study included in Volume 11 of the *Draft* Environmental Impact Statement (DEIS).

For its analysis of baseline geology within the project area, Sabina utilized relevant scientific literature in addition to findings from associated technical studies. Sabina noted that the Project would be located near the intersection of three (3) geological provinces identified as the Slave, Churchill, and Bear provinces. Sabina illustrated that glacial till, comprised mostly of moraine-type sand and silt, deposited after the Quaternary Wisconsin Glaciation covers much of the Archean Geological Provinces. In addition to abundant moraine material, Sabina identified the occurrence of glaciofluvial deposits in the area, including eskers approximately 100 metres (m) wide and several kilometres in length. Supplemental information regarding baseline geological conditions, as well as Sabina's analysis of the Goose Property's sedimentary rock package, mineralization, and bedrock characteristics, was provided in Volume 5, sections 1.1 to 1.1.3 of the FEIS.

In Section 1.2, Sabina highlighted its incorporation of Traditional Knowledge into its analysis of potential impacts to the geological environment within the project area. Through the use of Traditional Knowledge, Sabina noted that eskers, cliffs, copper, carving stone, and soil for sled runners were identified as geology-related topics of concern. Sabina indicated that the project footprint would not overlap with any known occurrences of soapstone, copper, silver, or any eskers or cliffs noted in the review of Traditional Knowledge. Further, Sabina committed to employing measures to minimize the level of disturbance of those areas if harvestable soapstone was identified in the Potential Development Areas.

Sabina identified slope stability, underground stability, frost heaving, ice scour, coastal erosion, sea level trends, and seismic activity as important design considerations for several infrastructure components included as part of the proposed Project. Using relevant scientific literature as well as geotechnical and hydrological modelling, Sabina provided an engineering hazard assessment, including the evaluation of

the likelihood, consequence factor, and mitigation measures for potential consequences, for the following components:

- Permafrost/Thaw Susceptible Soils
- Seismicity
- Flooding/Hydrology
- Open Pit Stability
- Open Pit Overburden Stability
- Waste Rock Storage Area Stability
- Tailings Storage Facility (TSF) Stability
- Underground Stability
- Surface Water Availability

Sabina noted that potential hazards associated with the above components, revealed through geotechnical and hydrological modelling as well as qualitative analysis, were addressed through engineering design alterations and specific mitigation measures. Proposed measures included:

- Continued geotechnical and hydrological monitoring with appropriate adaptive management measures;
- Design measures (e.g., locating structures on bedrock where possible and constructing side slopes, pit benches, underground infrastructure, ramps, berms, and ditches and foundations to meet seismic, stability, and safety parameters);
- Design of infrastructure to withstand extreme weather and seismic events; and design of water management systems to account for variable precipitation rates and maximum inflow levels;
- Permafrost protection measures (e.g., use of thaw-stable granular fill when excavation is required, use of insulation to control and limit effects of heat and restricted cooling, specific placement of waste rock in storage to promote aggradation, and protection of ice-rich material to avoid sediment release and instability); and
- Proper maintenance and cleaning of infrastructure.

Additional information regarding mitigation measures identified within Sabina's Engineering Hazard Assessment was provided in Volume 9, Section 2.2, and Table 2.2-1 of the FEIS.[103] Sabina included specific infrastructure design details in Appendix V2-7G: Back River Project — Tailings Management System Design Report, Appendix V2-7E: Back River Project — WRSA Design Report, and in Appendix V2-7J: Back River Report — FEIS Design Drawings.

In Volume 5.3 of the FEIS Addendum, Sabina provided clarification concerning geological features, surficial and bedrock geology, and geochemistry in response to the Board's concern that insufficient baseline data and insufficient design details; especially with regards to the proposed Tailings Storage Facility (TSF). Sabina noted that the conclusions presented in the FEIS did not change in the FEIS Addendum.

[103] FEIS, Table 2.2-1: Life of Project, Volume 2, Section 2.2, p. 2-6.

Sabina emphasized in the FEIS Addendum that it had provided additional fisheries baseline data for the proposed location of the TSF in response to a request by DFO in 2015, and since that time, no further requests were made by parties for additional baseline data with regards to the TSF. Within the FEIS Addendum, Sabina noted that throughout its public consultation and engagement, the tailings disposal plans were reviewed with community members on a number of occasions. Sabina highlighted that the proposed location of the TSF had been moved from Inuit Owned Land to Crown lands due to the Kitikmeot Inuit Association's (KIA) request during the DEIS technical meetings.

In the FEIS Addendum, Sabina indicated that the geotechnical and geochemical characterization of the proposed TSF area would be advanced through additional testing, analysis, modelling, and monitoring, as per several terms and conditions agreed upon at the 2016 Final Hearing with the KIA and Indigenous and Northern Affairs Canada. Specifically, Sabina committed to conducting additional, and more conservative, thermal modelling to support TSF design, and to undertaking an infill geotechnical characterization program to further understand areas where fractured bedrock was identified, including along the western ridge of the proposed TSF. Sabina also committed to providing the KIA with annual reports on the geochemical monitoring results of tailings, treatment sludge, and blast hole waste rock. Sabina stated that this additional information would support TSF design, as well as inform management and monitoring plans to be submitted to the Nunavut Water Board during the water licensing phase prior to project Construction.

4.5.2 Views and Concerns of Interested Parties

The Kitikmeot Inuit Association (KIA) indicated within its 2016 final written submission that the Proponent stated iron formation material from the Llama and Locale 2 deposit areas were comparable to similar mineral assemblages of Goose Main deposit; however, no supporting testing or documentation was provided to substantiate the statement within the FEIS.[104] The KIA observed that the iron formation material from the Goose Main deposit contains a higher non-potentially acid generating (NPAG) percentage relative to other deposit areas and the Goose Main deposit would contribute to a proportion of the anticipated waste volume. The KIA concluded that it would be important to assess elemental release rates of these waste materials to assess the potential long term leaching characteristics and noted that this could be requested as part of the project certification process. In written response to the request, Sabina provided figures that plotted the iron formation samples collected from both the Goose and George properties and provided a discussion on the results.[105] Sabina maintained that the iron formation samples subjected to humidity cell tests would be adequate to support the assessment of long term leaching rates of acidic- and neutral- pH mobile elements from these materials, both for iron formation from the Goose Main deposit and more generally for the other deposits.

The KIA also noted the importance of continued testing on the mine waste materials as the tailings are being produced. KIA noted that this would be important in order to assess arsenic release and other elements from the wastes and to ensure proper disposal methods would be in place to mitigate any potential release to the environment. The KIA recommended that Sabina present the proposed testing methods which should be a requirement of the project certificate. Further, the KIA noted that if sludge materials were produced, Sabina should have these submitted for full geochemical test work and make the results available to the NIRB and parties. Within its response to the 2016 final written submissions,

[104] Kitikmeot Inuit Association, 2016 Final Written Submission, March 10, 2016.
[105] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.

Sabina provided an explanation of the expected mobility of arsenic under both exposed and flooded conditions in its response to the KIA's comments and noted that additional characterization of trace elements released from the tailings would be addressed through the operational water quality monitoring programs, which would provide the most direct indication of leaching conditions under field conditions. Sabina also noted that sludges would not be produced as a result of ore processing or cyanide detoxification. Within Sabina's joint submission with the KIA (Exhibit 93) submitted during the 2016 Final Hearing, Sabina committed to test a mixture of tailings and treatment sludges as the sludges are produced to evaluate the potential for remobilization of arsenic from this material.[106,107]

Within its 2016 final written submission, Environment and Climate Change Canada (ECCC) noted that Sabina did not describe the proposed treatment contingency options for the Goose Main Tailings Facility (TF), and specifically for water quality parameters which could be elevated by the addition of sediments from the Saline Water Pond (SWP).[108] ECCC observed that as sediments would be removed from the SWP following closure of the pond to Goose Main TF, the question of potential sediment chemistry effects and the settling behaviour that could affect pit water quality would need to be addressed by the Proponent. Within its response to the 2016 final written submissions, Sabina noted that the SWP sediments would have eight (8) years to settle in the Goose Main TF prior to discharge to the environment indicating that this would be a sufficient length of time for the solids to settle and/or be removed via treatment from the facility. Sabina further noted that the Goose Main TF water would be treated year-round during operations in advance of the facility overflowing to Goose Lake. During the 2016 Final Hearing, ECCC again raised these concerns, noting that although Sabina had assessed the effects of chloride concentrations within the pit, its concerns were related to total suspended solid (TSS) concentrations and some of the metals associated with the sediment. ECCC did note that Sabina confirmed there would be sufficient time for the total suspended solids to settle out and the proposed treatment process would remove TSS, arsenic, and copper.[109]

ECCC further noted within its 2016 final written submission that assuming fluctuations in climatic conditions, it would be important that the Proponent undertake appropriate water balance and hydrological modelling to ensure that there is certainty with respect to maintaining the depth of oxidation of the active layer at 0.1 metres (m) over the years of mining. ECCC recommended that Sabina continue monitoring during the life of the mine to ensure that the observed conditions in the tailings are in line with the predictions made in the FEIS and to maintain the appropriate saturated conditions in the tailings. Sabina acknowledged that ongoing monitoring would be required to validate the results of the predictive modelling. However, Sabina stated that the focus of the monitoring should be on the predicted runoff quality, and not necessarily on specific input assumptions such as the depth of oxidization in tailings.

Indigenous and Northern Affairs Canada (INAC) indicated within its written submission that a fractured bedrock contact zone, found at the west abutment of the proposed tailings dam, could become

[106] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1077, lines 15-23.
[107] Sabina and Kitikmeot Inuit Association, Joint Submission, Exhibit 93, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[108] Environment and Climate Change Canada, 2016 Final Written Submission, March 9, 2016.
[109] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 443, lines 10-21.

unfrozen and form a seepage pathway of contaminated water into the environment.[110] INAC further noted that it was unclear whether the fractured bedrock zone extended into the west side ridge area, as no boreholes were drilled for confirmation. INAC requested that the potential seepage pathway be addressed and a bedrock treatment plan at the west abutment or alternatives to mitigate any potential seepage losses be provided. INAC also requested clarification on whether further work is planned to determine the extent of the fractured bedrock zone. In its response to the 2016 final written submissions, Sabina noted that drill holes were completed along the Tailings Storage Facility (TSF) dam alignment in 2015 with three (3) of these holes identifying a zone of shallow, partially saturated fractured bedrock at the interface between the overburden and competent bedrock along the west abutment. Sabina summarized the steps to be taken for the proposed foundation treatment along this zone.

INAC further noted that a low thawing n-factor of 1.0 was used for the run-of-mine waste rock embankment of the tailings dam in the tailings management system thermal modeling. INAC considered this thawing value to be low, which could result in the underestimation of the thawing effect of the designed frozen dam foundation and key trench, which could lead to seepage. INAC requested Sabina justify the use of a thawing n-factor of 1.0 in the thermal modelling conducted to support the frozen foundation and key trench design concept. Within its response to written submissions, Sabina noted that choice of thawing factor of 1.0 was an engineering judgement and after further review of the data is likely non-conservative. Sabina conducted two (2) additional model scenarios using a thawing n-factor of 1.3 and 2.0 as suggested by INAC for the climate boundary condition for the run-of-mine dam surface and provided figures in its response based on the results of the two (2) different scenarios.

During its presentation at the 2016 Final Hearing, INAC stressed its concern that an 85-year time constraint on modelling was insufficient when assessing climate change uncertainty for long-term impact analysis, especially with respect to both the tailings storage facilities and waste rock storage areas. INAC noted Sabina has outlined a number of mitigation options, however, indicated the importance of developing a strategy that outlines which mitigation options are most appropriate and how and when it could be determined that they need to be implemented to ensure these sites do not become long-term liabilities.[111] A revised suggested term and condition, agreed upon by Indigenous and Northern Affairs Canada, Natural Resources Canada, and Sabina was submitted in Exhibit 85 (2016 Final Hearing) to ensure long-term containment of the Tailings Storage Facility and Waste Rock Storage Areas through adaptive management and the potential implementation of alternative mitigation options. Additional discussion on this topic can be found in Section 4.2: Climate and Meteorology.

During the 2016 Final Hearing, INAC also noted concern with the potential for contaminated run-off from waste rock areas, through the active layer and bypass contaminant structures, during the early stages of the Project. INAC reviewed and expressed confidence in Sabina's plan, however, recommended that Sabina develop a monitoring program with the capacity to detect impacts that might not be contained and to submit the detailed program as part of the Nunavut Water Board water licence application.[112]

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[110] Indigenous and Northern Affairs Canada, 2016 Final Written Submission, March 7, 2016.
[111] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 566-567, lines 26 and 1-21.
[112] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 569, lines 9-13.

During the 2016 Final Hearing, INAC requested clarification from the KIA on why it was suggesting that blast hole cutting samples would be required for every acid rock drainage sampling.[113] Sabina responded to the question and provided clarification on the Mine Waste Rock Management Plan and noted that sampling would not be conducted for every blast hole and that the blast hole monitoring program would be further developed.[114]

Within its 2016 final written submission, Natural Resources Canada (NRCan) noted that it had no further comments or recommendations with regards to the information provided in the FEIS pertaining to surficial geology.[115] However, NRCan commented on the proposed extraction of material to be used for construction activities and the associated potential for thawing of ground ice, release of water and subsistence and ponding, and ground instability. NRCan added that the presence of ground ice could result in greater amounts of material being needed to meet aggregate needs and resulting in a larger area of disturbance. NRCan recommended that Sabina conduct the necessary investigations to improve characterization of potential borrow materials to support final borrow site selection to ensure that ice-rich terrain is avoided. Within its response to the 2016 final written submissions, Sabina noted that it agrees with NRCan's recommendations and reiterated its previous commitment to undertake the necessary characterization as stipulated within the Borrow Pits and Quarry Management Plan.

The KIA noted within its 2016 final written submission that it could not agree with the Proponent's statement that no fill would be required for the development of the winter ice road, as no supporting documentations or evidence was provided.[116] The KIA also noted that the planned inspection of the winter ice road for physical instability prior to closure would be inadequate to thoroughly assess and monitor impacts of the winter ice road on affected areas. Based on these observations, the KIA recommended that the use of fill for the construction of the proposed winter ice road not be allowed and no borrow site or quarry be used along the alignment unless an additional environmental impact assessment has been carried out and approved by the NIRB. In written response to the KIA's comments, Sabina re-iterated that the use of fill is not anticipated for any portion of the proposed winter ice road alignment and construction would be completed using only snow and ice. However, if quarry or borrow materials were required, Sabina would update the existing management plans to reflect changes in operation and/or technology. During the 2016 Final Hearing, the KIA requested clarification on how Sabina would avoid surface water ponding along the proposed winter ice road that could potentially develop due to changes to the thermal regime on the active layer by compacting the snow along the winter ice road. The KIA noted concern that either miniature dikes could be created along the road or, due to less insulation, more permafrost degradation could occur along the road, which could potentially impact the vegetation.[117] In response, Sabina stated that it has contracted an engineering company that is familiar with winter ice road construction and with standard best practices. Sabina did acknowledge that as the snow would be compacted, the active layer regime would be changed and there would be areas where ponding would occur.[118] Within Sabina's joint submission with the KIA (Exhibit 93)

[113] K. Costello, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 644, lines 2-12.
[114] M. Pickard, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 650, lines 5-22.
[115] Natural Resources Canada, 2016 Final Written Submission, March 7, 2016.
[116] Kitikmeot Inuit Association, 2016 Final Written Submission, March 10, 2016.
[117] L. Arenson, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 250-251, lines 1-7, 13-26 and 1-7.
[118] M. Rykaart, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 251, lines 9-21.

submitted during the 2016 Final Hearing, Sabina committed to provide information on the quarry or borrow sites and material required to the KIA if any earth or fill material, other than snow, ice, or water would be required. The KIA would then review the information before any material could be used for construction.[119,120]

Within its 2016 final written submission, NRCan also discussed the design of water retention structures (dams, dykes, and embankments) associated with the proposed TSF and dewatering of lakes and the potential for thawing, which could result in seepage, settlement, and instability if the underlying material is ice-rich. NRCan noted that it had confidence that the geotechnical investigations and thermal analysis undertaken by Sabina were sufficient to support preliminary design as well as seepage and stability analysis for water retention structures. NRCan recommended that Sabina incorporate any additional information acquired through future site specific geotechnical investigations into the thermal, seepage, and stability analysis for water retention structures. Sabina agreed with NRCan's recommendations within its response to the 2016 final written submission.

Discussion on the long term permafrost encapsulation by NRCan to effectively limit seepage from the TSF and to mitigate impacts to water quality was provided in Section 4.3.2: Noise and Vibration.

A community member from Behchokǫ̀ asked Sabina "… *how high are they going to be piling the rock? According to Diavik, they go three-storey high. Three-storey high is very high for the caribou. If they're going to migrate in the area 30 years from now, you know, and how are they going to re-vegetate that rock pile? How they going to cover it? What they going to cover it with …*"[121] Sabina noted the waste rocks piles are planned to be approximately 30 metres inside the height and that any potentially acid generating waste would be encapsulated inside of the non-potentially acid generating waste, which the permafrost would freeze back up through the rock.[122]

A Community Representative from Wekweètì raised questions to Sabina with respect to dykes that would be built to contain the tailings:

> *Whenever there is a mine and also this waste rock is -- they are talking about the waste rock. They're talking about the tailings. It is in the tundra. If they're going to build it -- if they're going to build a dyke, if they're going to be -- if they're going to build a dyke on the tailings or the dam, how high, how thick? And also it rains, the snow melts; what will happen to these dykes?…."*[123]

A Community Representative from Kugaaruk asked Sabina "… *do you pick the best spot to dig at your mine site or do you think there's a safe area to dig*"?[124] Sabina clarified that it takes many years of

[119] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1077, lines 8-14.
[120] Sabina and Kitikmeot Inuit Association, Joint Submission, Exhibit 93, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[121] P. Rabesca, Behchokǫ̀, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1043, lines 20-26.
[122] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1048-1049, lines 20-26 and 1.
[123] J. Judas, Wekweètì, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 951, lines 2-9.
[124] N. Nirlungayuk, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1135, lines 13-15.

exploration work followed by modeling before selecting where they plan to develop a mine.[125]

Within its final written submission on the FEIS Addendum, Indigenous and Northern Affairs Canada (INAC) concluded that adequate baseline information had been presented by Sabina. INAC indicated that the commitments made by Sabina to continue geotechnical and geochemical characterization and thermal modeling would allow identification of appropriate mitigation, management, and monitoring measures, and that it is standard engineering practice to complete this type of analysis prior to detailed design rather than during the environmental assessment stage. INAC specified that mitigation options are available to address any identified fractured bedrock and could take the form of excavation and/or grouting, with detailed plans to be developed during detailed engineering following additional testing and monitoring.

In its response to INAC's final written submission on the FEIS Addendum, Sabina confirmed its intent to follow-through with two (2) terms and conditions or commitments that were raised during the 2016 Final Hearing with INAC that require additional geotechnical testing, analysis, thermal modelling, and monitoring details to be provided during the water licensing process. Sabina also confirmed it would carry out the mitigation measures as proposed in the FEIS and as agreed to with regulatory parties. During the supplemental Final Hearing, INAC confirmed during its technical presentation that it considered the issue resolved.[126]

4.5.3 Views of the Board

During the 2016 Final Hearing, the Board requested clarification from Indigenous and Northern Affairs Canada (INAC) on whether Sabina's plans for managing potential acid rock drainage were considered to be sufficient and whether INAC's inspectors would be monitoring to ensure they were conducted appropriately.[127] INAC indicated that the plans were found to be generally adequate and noted that recommendations were made to resolve the Department's outstanding concerns.[128] INAC further clarified its inspector's role with ensuring implementation of management plans and the Proponent's annual report requirements.[129]

During the 2016 Final Hearing, the Board further requested clarification from Sabina on whether the tailings pond would be situated on the bedrock or on the ground and whether modelling of potential permafrost erosion and melting had been completed.[130] Sabina responded that the Tailings Storage Facility (TSF) would be located on the ground with a dam foundation of overburden soils, permafrost

[125] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1135-1136, lines 20-26 and 1-9.
[126] R. Theoret-Gosselin, Indigenous and Northern Affairs Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 525, lines 18-23.
[127] H. Ohokannoak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 584-585, lines 20-22 and 9-12.
[128] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 584-585, lines 24-26, 1-6, 15-26 and 1-4.
[129] K. Costello, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 585-586, lines 15-26 and 1-4.
[130] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 621, lines 23-26.

sands and silts, which would range in thickness of about one (1) to about 20 metres, followed by bedrock.[131]

The Board also asked during the 2016 Final Hearing whether any research or modelling was completed regarding the potential for thawing and freezing to cause cracks in the bottom layer of the tailings, and if so, whether Sabina proposed any specific mitigation measures.[132] In response Sabina described the potential physical actions of rock fracturing, boulders surfacing, and how the type of materials used to build the dam or retain the TSF would be selected to prevent those conditions.[133]

In response to the Board's question during the 2016 Final Hearing on the type of program Sabina would undertake regarding fractured bedrock, Sabina explained what the zone of fractured material was and their associated monitoring procedures.[134]

In the 2016 Final Hearing Report, the Board noted that concerns were raised by several parties on the potential for seepage from the proposed Tailings Storage Facility (TSF), and the Board was not confident that adverse impacts on the environment would be avoided.

Following a review of the information presented by Sabina in the FEIS Addendum and at the supplemental Final Hearing, as well as the information and responses from Parties, the Board is of the view that mitigation activities have now been sufficiently detailed by the Proponent for this stage of project development, and provide confidence that the environment will be adequately protected. These activities include further geotechnical characterization and thermal modelling prior to the start of operations (with excavation or grouting possible mitigative steps to be taken if needed to address fractured bedrock). The Board agrees that ongoing monitoring of the proposed tailings dam will be required throughout the life of the mine to ensure that the observed conditions in the tailings are in line with the predictions made in the FEIS and the FEIS Addendum, and that proper mitigation measures are in place.

4.5.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board concluded it was not assured that the environmental design features and mitigation measures proposed by Sabina to minimize project-specific impacts to geological features, surficial and bedrock geology, and geochemistry, especially as regards the Tailings Storage Facility, were sufficient to address the concerns raised by parties. With the information provided by the Proponent in the FEIS Addendum and the follow-up responses from Parties, the Board believes that the Project's potential effects related to geological features, surficial and bedrock geology and geochemistry could be appropriately managed through the commitments provided by the Proponent and application of mitigation measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for

[131] M. Rykaart, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 622, lines 5-10.
[132] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 622, lines 13-24.
[133] M. Rykaart, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 623-625, lines 1-26, 1-26, and 1-16.
[134] M. Rykaart, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 1212-1213, lines 1-26 and 1.

ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Maintain site-specific quarry operation and management plans to provide more detailed mitigation and site management requirements;
- Conduct tests of the tailings and treatment sludges to evaluate the potential for remobilization of arsenic from these materials and demonstrate appropriate management; and
- Undertake an infill geotechnical characterization program to determine the extent of the fractured bedrock contact zone to provide more detail of the area and demonstrate any potential risks to integrity of the structures are being addressed.

The Board further notes that recommended term and condition no. 2 in Section 4.2.4: Climate and Meteorology related to the requirement for the Proponent to maintain a Mine Closure and Reclamation Plan is also relevant to the Geological Features, Surficial and Bedrock Geology, and Geochemistry.

4.6 HYDROLOGICAL FEATURES AND HYDROGEOLOGY

4.6.1 Views of the Proponent

Sabina provided its assessment of potential project impacts on surface hydrology and hydrogeology in Volume 6, sections 1 and 2 of the FEIS. Additional information detailing Sabina's baseline hydrology studies conducted between 2011 and 2014 was provided in Appendix V6-1A: through to Appendix V6-1D. Information pertaining to Sabina's general hydrological and hydrogeological studies was provided in Appendix V2-7B: Back River Project – Hydrology Report and Appendix V2-7A: Back River Project – Hydrogeological Characterization and Modeling Report. Information on how Sabina incorporated Traditional Knowledge into its effects assessment for the hydrological and hydrogeological environment was provided in sections 1.2 and 2.2, respectively. Sabina indicated that site water management activities would result in residual effects on streamflows and lake volumes. The potential residual effects to hydrology were predicted, contingent on the application of mitigation measures, to be not significant due to their low magnitude, spatial confinement to the Project Development Area (PDA) and Local Study Area (LSA), continuous medium-term duration, and reversible nature. Sabina highlighted that all project components would be expected to interact with the groundwater environment to some degree, but that continuous permafrost throughout the Goose Property would limit this interaction.

Sabina identified the following three (3) spatial boundaries for its assessment of potential project-induced impacts to hydrology and hydrogeology:

- *Goose Property Potential Development Area* (Goose Property PDA) — Includes the project footprint which encompasses areas of planned infrastructure at the Goose Property.
- *Local Study Area* — Includes the Goose Property PDA in addition to the watershed boundaries of the Propeller and Big watersheds for a total assessment area of 365 square kilometres (km^2).
- *Regional Study Area* (RSA) — Includes the Goose Property PDA and the LSA, in addition to areas identified for potential indirect or cumulative effects for a total assessment area of 6,815 km^2. Sabina highlighted the specific inclusion of the upper 80 kilometres (km) of the Ellice Watershed as well as smaller sections of both the Ellis and Back River watersheds into the RSA.

The temporal boundaries identified in Sabina's assessment aligned with all Project phases including

construction, operation, reclamation, and post-closure monitoring (see Section 2.2.3: Project Phases).

Hydrology

Sabina conducted its analysis of baseline hydrological conditions in the project area using relevant scientific literature, regional data available from hydrometric stations operated by the Water Survey of Canada and from mining projects in the region, as well as data obtained through its hydrometric monitoring program. Sabina noted that through its hydrometric monitoring program it collected and analyzed data from up to 22 hydrometric monitoring stations during the open-water season (June to late-September 2010 to 2015), and was designed to monitor inflow and outflow systems, lakes, and development areas. Sabina's study included watershed areas delineated using National Hydro Network data and confirmed by visual observations. Sabina also noted that LiDAR and topographic data, as well as visual observations, were used to identify additional watersheds for its study where necessary. Sabina concluded that surface hydrology in the area is governed by the Arctic nival regime where peak flow discharges occur during the spring freshet and again during precipitation events in late summer or early fall (see sections 2.1: Description of Project Location and 2.1.1: Biophysical Conditions).

In its assessment of potential impacts on the hydrological environment, Sabina included an analysis of anticipated global climate change interactions with the Project. Sabina highlighted that its assessment of potential climate change impacts on hydrology was based on impacts that could occur throughout the first half of the twenty-first century. Using referenced quantitative studies where possible, in addition to qualitative analysis, Sabina identified changes to the active layer, as well as increased total annual runoff, winter flow, and intensity of extreme events, as potential global climate change impacts that could influence surface hydrology in the project area (see Section 4.2: Climate and Meteorology).

Sabina noted that due to the broad scope of the Surface Hydrology Valued Ecosystemic Component, it focussed its assessment of project-induced effects using the following quantifiable indicators:

- *Streamflows* – Identified for its importance related to fish and aquatic habitats maintained through streamflows, as well as terrestrial wildlife habitats that rely on these water systems.
- *Lake Volumes* – Identified to address reductions in lake volumes during winter months which could impact fish through oxygen depletion, loss of over-winter habitat, and/or reductions in littoral habitat.

Sabina used data from its hydrometric monitoring program and from regional hydrometric stations in a water balance model to predict effects of the proposed project on streamflow during various phases of the Project. Predicted impacts to lake volumes and outflows were also generated using a water balance model with daily time-steps. Sabina provided additional information regarding its hydrological impact models in Appendix V2-7H: Back River Project – Water and Load Balance Report, Appendix V6-1E: Back River Project – Effects of Proposed Development and Water Withdrawal on Hydrologic Indices of Goose and Propeller Lakes, and Appendix V6-1F: Back River Project – Effects of Proposed Water Withdrawal on Hydrologic Indices of Big Lake.

Sabina identified the following project components and activities for their potential to impact streamflow and/or lake volumes within the hydrological environment:

- Site water management activities:
    - Water withdrawal from lakes – Potential impacts to streamflows and lake volumes as a result of domestic and industrial water withdrawals from Goose and Big lakes during

construction, operations, and closure activities.

- Water diversions and storages – Potential impacts to streamflows and lake volumes as a result of proposed water management infrastructure upstream of Goose Lake to divert and store contact and non-contact water in the Tailings Storage Facility (TSF) and pits.
- Modification of natural drainage – Reduced runoff coefficients at waste rock storage areas were identified as potentially affecting streamflows and lake volumes during all phases.
- Lake dewatering – Potential impacts to streamflows and lake volumes as a result of the proposed dewatering of lakes or portions of lakes to construct, expand, or develop new mine pits.

- Winter ice road construction and maintenance – Annual use of water to build and maintain winter ice roads identified as potentially affecting streamflows and lake volumes.

Sabina outlined specific measures for the mitigation of predicted impacts to the hydrological environment, including: monitoring and adaptive management measures; measures for the confinement of project infrastructure to manage effects on local watersheds; and measures for the management of non-contact water, contact water, and saline water. Additionally, Sabina noted that water withdrawal and road construction would adhere to the Fisheries and Oceans Canada's guidelines for winter water withdrawal and suggested measures to avoid causing harm to fish and fish habitats. Sabina provided additional information pertaining to the above mitigation measures and on-site water management systems in Appendix V2-7I: Back River Project – Site-Wide Water Management Report; Volume 10, Section 7: Site Water Monitoring and Management Plan; and Volume 10, Section 14: Road Management Plan.

Sabina concluded that the proposed mitigation measures would eliminate all potential effects of road construction and maintenance on surface water hydrology. However, site water management activities, including water withdrawal, water diversions and storages, modification of natural drainage, and lake dewatering, would result in residual effects on streamflows and lake volumes. Based on quantitative and predictive modelling, Sabina indicated that site water management activities would alter drainage patterns within the LSA and that streamflow at some headwaters of the LSA within the PDA could cease, notably decrease, or considerably increase. Sabina indicated that the Llama and Umwelt lakes would be dewatered to 100% volume reduction. Streamflow reductions in larger watersheds within the LSA were predicted to be less notable than flow reductions in headwater catchments. Sabina estimated that effects of the Project on streamflows at the LSA boundary would be low (less than 10% change in streamflow volume) and that effects of the Project on streamflows at the RSA boundary would be negligible (less than one percent (1%) change in streamflow volume).

Sabina concluded that the predicted residual effects would be low in magnitude, confined with the PDA and LSA, medium-term in duration, continuous in nature, and reversible. Sabina predicted, contingent on the application of mitigation measures contained in the Site Water Monitoring and Management Plan, that the potential residual effects to surface hydrology would be not significant. Sabina noted that no past, present, or foreseeable projects exist within the RSA, and given that the Project's potential residual effects would be confined to the LSA, no cumulative or transboundary effects would be expected on hydrology.

Hydrogeology

Sabina discussed two (2) groundwater flow regimes present within the continuous permafrost context of the Project: shallow supra-permafrost flow in the active layer, and sub-permafrost flow beneath the base of the permafrost. Sabina described groundwater flows in the active layer as being influenced by surface topography and the hydraulic conductivity of overburden materials, with a general east-to-west flow pattern. Sub-permafrost groundwater throughout the project area was inferred to flow northward towards the Arctic Ocean based on Sabina's analysis. Sabina indicated that there is minimal interaction between these flow regimes due to the presence of low-permeability permafrost, but that sub-permafrost groundwater is hydraulically connected to surface water and the active layer via through taliks (see Section 2.1.1: Biophysical Conditions)

Sabina identified five (5) hydrostratigraphic units to categorize the hydrogeological conditions in the Goose Property PDA, including: active layer, shallow talik, middle talik, deep talik, and sub-permafrost and permafrost. Sabina indicated that all project components would be expected to interact with the groundwater environment to some degree, but that continuous permafrost throughout the Goose Property would limit this interaction. Sabina indicated that supra-permafrost groundwater may interact with project components and that changes to flow patterns would be similar to those predicted for surface water (see Section 4.7: Groundwater and Surface Water Quality). Sabina predicted that closed taliks may develop beneath the TSF and the Saline Water Pond (SWP), but noted that the high-salinity water thought to be contained and thawed within the permafrost would be hydraulically isolated due to the construction of dams and the related permafrost aggradation into the dams.

Sabina noted that open pit mines would be expected to develop frozen layers when exposed to cold temperatures during excavation and dewatering. Sabina added that no metal leaching or acid rock drainage (ARD) would be expected to contact groundwater due to dewatering and the aggradation of ice layers (see Section 4.4: Terrestrial Environment).

Sabina noted that the Umwelt, Llama, and Goose Main underground mines would penetrate through the permafrost layer and contact groundwater in the basal cryopeg. The underground mines would also act as local groundwater sinks with groundwater flowing through fractures towards the mines. Sabina noted that no ML or ARD would be expected to contact groundwater during operations due to dewatering and the radial-inward groundwater flow that would result. It was further noted that flooding of both open pit and underground mines would result in the resurgence of taliks and isolate exposed bedrock from further oxidation.

In Volume 6.1 of the FEIS Addendum, Sabina provided clarification concerning hydrology and hydrogeology in response to the Board's concerns, as expressed in the 2016 Final Hearing Report, that insufficient baseline data had been collected and that the proposed mitigation measures may not be adequate given the probability of taliks forming under the proposed pits or Tailings Storage Facility (TSF). Sabina noted that the additional information provided in the FEIS Addendum would not change the conclusions presented in the Surface Hydrology assessment (FEIS Volume 6, Chapter 1).

In Volume 6.1 of the FEIS Addendum, Sabina reviewed the extensive hydrological and hydrogeological baseline data that had been collected, and also reviewed the concerns that had been raised during the Review of the DEIS and in the FEIS technical review phase in regards to groundwater flow and permafrost and talik distribution. Sabina emphasized in the FEIS Addendum that the groundwater and thermal modeling used in the FEIS would resolve any previously raised concerns. Sabina noted the last version of the thermal modelling in particular had demonstrated that that no through talik would exist

under the TSF (FEIS Appendix V2-7G, Appendix G). It was further stated that while taliks would be expected to form under pits, and pit water would infiltrate the groundwater system, it would not change the natural direction of groundwater flow. Models indicated that Goose Lake would be the ultimate receptor of pit water more than 1000 years from now. Sabina added that at Post-Closure, once the pit lake taliks are connected, the Goose Lake long-term water quality would be expected to meet the guidelines of the Canadian Council of Ministers of the Environment, and salinity should not be an issue.

4.6.2 Views and Concerns of Interested Parties

Environment and Climate Change Canada (ECCC) noted within its 2016 final written submission that even though passive flooding of the open pits is a reasonable approach to pit remediation, extending filling time could allow for the development of acidic conditions and metal leaching from the pit walls, which would degrade water quality in the pits.[135] ECCC further indicated that the suggested emplacement of barriers by Sabina to prevent fish access to the filled pits has not been done in Northern Canada for this type of terrain. ECCC recommended that the Closure Plan be periodically updated throughout the life of project to ensure that the proposed plans would address conditions and achieve an acceptable closure state. In response to the 2016 final written submission, Sabina confirmed that the closure plan would be periodically updated throughout the life of the Project as it is a 'living document'.[136] During the 2016 Final Hearing, ECCC raised these concerns again in its presentation noting that appropriate monitoring of conditions in the open pits would have to be conducted. It was noted that monitoring would have to include any environmental conditions affecting closure and the development of contingency plans for treatment of pit water and active filling of pits, if needed. ECCC also requested to review the plans for design and ground truthing of the barriers at closure for fish passage. ECCC noted that the Sabina addressed the concerns related to pit closure within the written response.[137]

ECCC further noted in its 2016 final written submission that plans and predictions would need to be adjusted through the life of the Project in response to changes to unanticipated conditions, operational learnings, technological advances, and environmental factors. Appropriate monitoring of site water quality and geochemical sources of contaminants would be necessary and ECCC recommended that Sabina commit to ongoing monitoring and implementation of appropriate mitigation measures. In response, Sabina summarized monitoring activity commitments made in the Mine Waste Rock Management Plan as well as noting that runoff water quality monitoring would be conducted as described within the Site Water Monitoring and Management Plan. During its presentation at the 2016 Final Hearing, ECCC noted that it was satisfied with the monitoring activities that Sabina committed to and their commitment to respond to monitoring results with adaptive management as appropriate.[138]

Within its 2016 final written submission, Indigenous and Northern Affairs Canada (INAC) indicated that the hydrogeological modelling conducted by Sabina did not include flow systems within the permafrost zone and noted that these zones can lead to larger than expected volumes of water entering the pits

[135] Environment and Climate Change Canada, 2016 Final Written Submissions, March 9, 2016.
[136] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[137] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 442-443, lines 12-26 and 1-9.
[138] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 444, lines 14-26.

and underground mining areas.[139] INAC recommended that Sabina re-evaluate the fault zones and other geological structures that can potentially form inflow conduits in its hydrogeological modeling, or demonstrate that sufficient contingencies are incorporated in the Water Management Plan to accommodate the potentially much greater inflows into the pit. Within its response to written submissions, Sabina acknowledged the likelihood that flow in the mines would be dominated by specific fractures or features intercepted, and that the mines could intercept such flow conduits. Sabina added that this uncertainty exists for all mining projects conducted in fractured rock and that uncertainty would never be completely alleviated until structural geology and hydrogeology data is regularly collected during mining operations. Sabina further indicated that the influx of water into a mine is a normal and well understood phenomena and is regularly managed by standard operating procedures in operating mines. Sabina concluded that it is aware of the uncertainty related to fault zones and would safely and appropriately manage groundwater inflows. During its presentation at the 2016 Final Hearing, INAC indicated that Sabina's response outlined conservative measures built into the Water Management Plan, noting that the mitigation and contingency measures are appropriate to handle the potential for greater than expected inflow into mine structures.[140]

INAC further noted within its 2016 final written submission that containment of the Tailings Storage Facility (TSF) would be provided by the Main Dam, the South Dam, and the two side ridges (high ground) on the east and west sides of the TSF. INAC indicated that the ridges could pass contaminated water into the environment through the active layer or through fractured bedrock zones if these become thawed due to water/tailings deposition and/or climate warming. INAC noted that the tailings dams, and any natural containment ridges, need to be watertight to impede seepage of contaminated water from the tailings basin. INAC further noted that the ridge on the west side between the TSF and Rascal Lake is considered more sensitive due to the presence of a talik beneath the lake. INAC outlined that this talik could become part of the seepage pathway and allow any potential contamination to disperse over a larger area and impact the water quality of Rascal Lake. INAC recommended that the Proponent develop a thermistor installation plan at the South Dam and the east and west ridges of the TSF for temperature monitoring. In addition, INAC recommended that a groundwater and surface water quality monitoring plan around the TSF be developed as a part of the site water quality monitoring program to detect seepage losses. INAC further recommended the implementation of appropriate mitigation measures, if required. Within its response to the 2016 final written submissions, Sabina noted that the TSF operational period would be short-lived with the TSF becoming an event pond with two dams proposed to ensure containment. Sabina added that the containment dams would be frozen foundation dams and based on conservative thermal analysis for these dams, seepage would be contained. Sabina noted that it has proposed thermal monitoring during the TSF operation period to monitor the dam performance. Further, additional appropriate monitoring strategies would be developed depending on the mitigation strategies employed for the TSF western ridge. During its presentation at the 2016 Final Hearing, INAC noted that it was satisfied with most of Sabina's measures as outlined within its responses to the 2016 final written submissions. INAC stressed again the importance of thermal monitoring of the western ridge to provide assurance that contaminants are contained with the TSF as it was noted by INAC to be a high risk area. INAC further noted the importance of developing a monitoring program to detect potential impacts to Rascal Lake in order to confirm that the TSF design is working as intended

[139] Indigenous and Northern Affairs Canada, 2016 Final Written Submissions, March 7, 2016.

[140] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 560, lines 17-23.

and that there are no impacts associated with seepage.[141] By the end of the 2016 Final Hearing, Sabina and INAC provided wording for a commitment to address the above concerns (Exhibit 85).[142]

Natural Resources Canada (NRCan) also provided comments within its 2016 final written submission regarding the potential for pit lakes to develop through taliks, as the size of some open pits would be close to or larger than the critical size required for the development of through taliks.[143] If saline sub-permafrost groundwater were to enter pit lakes following closure, NRCan indicated that the water quality in the pit lakes could be adversely affected as a result of the saline nature of the deep groundwater system. Further, it was noted that if pit lakes were allowed to form part of a natural surface water flow system, then there could be the potential for other surface waters to be impacted. NRCan also noted that the TSF could develop a talik which could result in saline groundwater inflows that could delay the freeze-back of the TSF foundation. NRCan noted concern that warmer conditions in the future could result in thawing of the tailings pile and its foundation and the potential for seepage and impacts on surface and subsurface water quality. NRCan indicated that the Closure and Reclamation Plan did not include a discussion on which flooded pits may develop open taliks. NRCan recommended that the Proponent consider the potential for through taliks to form beneath flooded open pits and the long-term effects on water quality and quantity; consider the potential for tailings storage in Umwelt Pit and Goose Main Pit to impact on quality and quantity in the event that through taliks form beneath flooded open pits; and consider the long-term effects of storage of tailings in flooded open pits and utilize this information to evaluate post-closure monitoring needs and mitigation measures.

In its response to the 2016 final written submissions, Sabina noted that the thermal modelling presented in the FEIS indicated that taliks would develop beneath pit lakes and become connected to the sub-permafrost. Sabina added that the timing for open taliks to develop for base conditions was estimated to be 85 years for Goose Main Pit, 111 years for Umwelt Pit, and 227 years for Echo Pit; the Llama pit was noted to already be located within a through talik associated with Llama Lake. Sabina further indicated that it modified the FEIS numerical groundwater model to simulate post-closure conditions and assess the potential changes to the hydrogeological system with the newly formed open taliks. Sabina indicated that the results from the model showed that at post-closure, once the pit lakes taliks are connected, the Goose Lake long-term water quality would be expected to meet Canadian Council of the Ministers of the Environment (CCME) guidelines. The water and load balance model included loadings from pit overflows to Goose Lake at closure; therefore, Sabina noted that the model already conservatively assumed that 100% of the source load (i.e., tailings and waste rock) from the pit lakes would reach Goose Lake at Closure. Since the salinity of the groundwater contained in the rock mass at depth would be much higher than the predicted salinity of the pit lake water, Sabina indicated that the formation of pit lake taliks would not be expected to affect the groundwater salinity discharged into Goose Lake.

During its presentation at the 2016 Final Hearing, NRCan noted that the additional analysis conducted by Sabina provided a better understanding of the current and future configuration of permafrost and taliks, and the results of the analyses supported the development of appropriated groundwater models and assessments of the effects of the Project on water quality and quantity. NRCan noted that through taliks

[141] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 561-562, lines 2-26, 1-20.
[142] Federal Departments, Exhibit 84, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[143] Natural Resources Canada, 2016 Final Written Submission, March 7, 2016.

may exist at Umwelt Lake and that Sabina has indicated that the water quality would meet CCME guidelines. NRCan indicated that Sabina sufficiently revised its plan for tailings management and that in its view, seepage from the TSF would be adequately managed in consideration of the noted changes.[144,145] In response, Sabina noted that it agreed with all the recommendations as worded in the presentation, which included surficial geology, explosive storage and manufacture, permafrost and terrain conditions, and hydrogeology for the project proposal but confirmed that there were outstanding items with DFO and INAC. In response to a confirmation request from Sabina, NRCan confirmed that additional requested information could be provided to NRCan during the regulatory phase.[146]

Within its 2016 final written submission, NRCan limited its scope of hydrogeology review to the potential effects on groundwater quality and quantity and the potential interactions with surface water resulting from the project activities. NRCan noted that uncertainty remained with respect to potential saline water inflows into open pits and the Umwelt Underground Mine, and that accurate characterization of saline water inflows into underground mine workings is necessary as the water management system must be equipped to manage all brines. NRCan indicated that saline water inflows into open pits could be a technical problem during mining if inflows are unexpected and could lead to storage or disposal issues. To ensure effective saline water management for the Llama Lake and the proposed Llama Pit, NRCan recommended that Sabina continue to monitor thermal conditions within the Llama pit during mining and to verify, during mining, if predicted seepage into the Llama pit was accurate. With respect to the Umwelt Underground Mine, NRCan recommended Sabina consider measures to monitor the effects of faults on mine inflows. In its response to the 2016 final written submissions, Sabina indicated that it would continue to monitor thermal conditions within, and seepage into, Llama pit during mining to ensure effective saline groundwater management. Sabina re-iterated that there is a likelihood that flow in the mines would be dominated by specific fractures or features intercepted, similar to its response to INAC's comments as outlined above. During its presentation at the 2016 Final Hearing, NRCan indicated that Sabina addressed its concerns. Sabina has committed to monitor thermal conditions to ensure effective saline water management at Llama pit, and outlined mitigation measures to address potential saline water inflows into the Umwelt Underground Mine.[147]

NRCan noted in its 2016 final written submission that Sabina outlined a new Site Water Monitoring and Management Plan in response to its questions regarding saline water management and underground mine inflows. NRCan indicated that the Plan answered many of its questions; however, it noted that clarification was still required with respect to the Saline Water Pond (SWP). More specifically, NRCan asked for clarification on if the SWP would establish an open or through talik during operations, if seepage from the SWP during operations had been considered, and where residual saline sediments would be transferred to once the SWP has been emptied during closure. In response, Sabina noted that it had considered the potential for open talik and seepage from the SWP and addressed these items within Appendix C of the Site-Wide Water Management Report as part of the FEIS. Sabina further

[144] R. Besner, Natural Resources Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 608-609, lines 11-26 and 1-5.
[145] R. Besner, Natural Resources Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 612-614, lines 23-26, 1-26 and 1-15.
[146] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 618-619, lines 3-13, 24-26, 1-2 and 9-16.
[147] R. Besner, Natural Resources Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 610-611, lines 11-26 and 1-22.

provided a summary on the objectives from the two-dimensional thermal modelling of the SWP that was completed to support the geotechnical and hydro technical design of the two containment dams (the East and South Containment Dams). Sabina noted that during the closure phase, impacted sediments from the SWP would be excavated and transferred to Goose Main TF once the water contained in the SWP is pumped back to the underground mines, as per the Site Water Monitoring and Management and the Mine Closure and Reclamation plans.

Within its final written submission on the FEIS Addendum, Natural Resources Canada (NRCan) stressed that its concerns regarding the potential for talik development under the Tailings Storage Facility (TSF) and other pit lakes were associated with the DEIS, and that the TSF design presented in the FEIS was significantly different. NRCan reiterated that Sabina's assessment of potential talik development under pit lakes presented in the FEIS was adequate to assess potential impacts on water quality and quantity. NRCan highlighted that Sabina confirmed in the FEIS Addendum that no talik would form under the TSF. NRCan concluded in its final written submission on the FEIS Addendum and during the supplemental Final Hearing that it had no additional recommendations with respect to this issue and that the proposed commitments and monitoring and mitigation plans would ensure minimal impacts.[148]

4.6.3 Views of the Board

During the 2016 Final Hearing, the Board requested clarification on the meaning of 'starter' above-ground impoundment and whether it meant temporary storage of the tailings.[149] Sabina noted in response that the initial above-ground tailings facility would be used for the first couple of years of operations and then it would be converted into a waste rock storage facility with tailings being deposited into the mined-out Umwelt open pit, and then to the Goose Main open pit.[150]

During the 2016 Final Hearing, the Board also requested clarification on how Sabina proposed to properly and safely fill or reclaim site ponds, pits, and tailings storage areas, and whether the pits would be safe to drive machines over during the winter.[151] Sabina explained its Mine Closure and Reclamation Plan and noted that the frozen pits would be safe for passage through the area during the winter.[152]

In the 2016 Final Hearing Report, the Board noted that concerns were raised by several parties regarding the potential for taliks to develop under pit lakes, the Saline Water Pond, and the Tailings Storage Facility. While recognizing the mitigation measures proposed by Sabina, the Board was still concerned with the potential for changes in permafrost/talik distribution and flow paths that may be directly or indirectly attributed to the proposed project facilities and activities. The Board concluded in the 2016 Final Hearing Report that due to the limited baseline available in the FEIS and the probability of taliks forming under the pits or the Tailings Storage Facility (TSF), the Board could not be confident that the

[148] R. Besner, Natural Resources Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 567 lines 7-22 and p. 571, lines 2-5.
[149] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 86, 87, lines 21-23, 19-22.
[150] S. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 87 and 88, lines 5-15, and 26, 1-8.
[151] E. Copland, Board Chairperson, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 967, 968, lines 6-10, 20-22.
[152] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 967-969, lines 13-26, 1-18, 23-24 and 1.

proposed mitigation measures in conjunction with a commitment from Sabina to collect additional baseline data would sufficiently mitigate the project-specific impacts.

After reviewing the additional information provided by Sabina in the FEIS Addendum and the supplemental Final Hearing, as well as the updated views of Parties on the topic, the Board understands that no talik is likely to form beneath the TSF, and that taliks forming under pit lakes are not expected to result in adverse effects to groundwater. The Board agrees with Sabina's statement that the Closure Plan is a 'living document' and that the plan would need to be updated throughout the life of the Project in conjunction with ongoing monitoring.

4.6.4 Conclusions and Recommendations of the Board

The Board concluded in the 2016 Final Hearing Report that due to the limited baseline available in the FEIS and the probability of taliks forming under the pits or the Tailings Storage Facility, the Board could not be confident that the proposed mitigation measures would sufficiently mitigate the project-specific impacts. After reviewing the updated views of the Proponent and the updated views of the Parties through the FEIS Addendum, final written submissions on the FEIS Addendum, and the supplemental Final Hearing, the Board believes that the Project's potential effects related to hydrological features and hydrogeology have been adequately assessed and could be appropriately managed through the commitments provided by the Proponent and the application of the following key mitigation measures:

- Maintain a saline water management plan to monitor saline water movement at the Goose site to address the potential for higher-than-predicted volumes of saline water inflows into the open pits and the underground mine, and demonstrate appropriate treatment and disposal methods; and
- Develop a thermal monitoring plan to address the potential changes in permafrost/talik distribution, flow distribution and flow paths that may be directly or indirectly affected by the Project facilities and activities.

The Board further notes that recommended term and condition no. 2 in Section 4.7.4: Groundwater and Surface Water Quality is also relevant to the Hydrological Features and Hydrogeology.

4.7 GROUNDWATER AND SURFACE WATER QUALITY

4.7.1 Views of the Proponent

Sabina presented its assessment of potential project-induced impacts on groundwater and freshwater quality within Volume 5, Sections 2, 3, and 4 of the FEIS. Supporting baseline information and methods were provided in Appendices V2-7A, V2-7H, V2-71, and V6-3A to V6-3C. Sabina noted that no water quality concerns were specifically noted during community consultations and no traditional drinking water sources were identified within the project area. Therefore, Traditional Knowledge was not included to collect baseline freshwater quality information. Sabina indicated that the majority of groundwater inflow interactions would occur at the Umwelt underground mine, with the largest volumes requiring management during Year 3 of operations. All inflows from the Umwelt, Llama, and Goose Main underground mines, as well as inflows to the Llama open pit, would be pumped to the Saline Water Pond during operations. Sabina predicted four (4) residual effects on the freshwater environment from the ten potential project interactions groups identified in its effects assessment. The residual effects identified in its assessment consisted of sediment-related effects from construction and

decommissioning activities, site contact water, mine contact water, and explosives residues. Sabina determined, contingent on the application of mitigation measures, that the potential residual effects would be not significant, and further determined that they would not contribute to cumulative or transboundary effects due to their limited spatial extent.

Sabina identified the following three (3) spatial boundaries for its assessment of project-induced impacts to freshwater quality:

- *Goose Property Potential Development Area* (Goose Property PDA) — Includes the project footprint which encompasses areas of planned infrastructure at the Goose Property.
- *Goose Property Local Study Area* (LSA) — Includes the Goose Property PDA in addition to the watershed boundaries of the Propeller and Big watersheds for a total assessment area of 365 square kilometres (km^2).
- *Freshwater Regional Study Area* (RSA) — Includes the Goose Property PDA, the Goose Property LSA, in additional to areas identified for potential indirect or cumulative effects for a total assessment area of 6,815 km^2. Sabina highlighted the specific inclusion of the upper 80 kilometres (km) of the Ellice Watershed as well as smaller sections of both the Ellice and Back River watersheds into the RSA.

Sabina noted that the Marine Laydown Area (MLA) was not considered in its assessment of freshwater quality, as the MLA PDA would not be expected to interact with any streams included in its analysis. Sabina indicated that effects related to the MLA were captured in Volume 7, Marine Environment.

The temporal boundaries identified in Sabina's assessment aligned with all project phases, including mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

Groundwater

In its analysis of baseline groundwater levels and groundwater quality, Sabina referenced relevant scientific literature, past studies conducted within regions of continuous permafrost, and site studies conducted within the Goose Property PDA. Additional information pertaining to Sabina's groundwater testing, monitoring, and hydrogeological site investigations was provided in Appendices V6-2A to V6-2C. Based on Sabina's Westbay Well Monitoring System studies, groundwater was described as being hypersaline and dominated by calcium chloride and sodium chloride salts. Sabina noted that concentrations of most metals were below the thresholds for the protection of aquatic life based on the Canadian Council of Ministers of the Environment (CCME) guidelines, with the exception of fluoride, iron, arsenic, and zinc. Trace metal exceedances for chromium, selenium, silver, and thallium were also noted. Groundwater was further described as having a neutral pH becoming slightly alkaline upwards towards the base of the permafrost.

Based on numerical groundwater modelling, Sabina predicted that total groundwater inflows requiring management at the Goose Property would reach a maximum of approximately 830 cubic metres per day (m^3/day) during Year 3 of operations. Over half of the identified inflows were predicted to come from the Umwelt underground mine, with minor inflows expected to occur at the Goose Main underground mine. Sabina noted that total dissolved solids concentrations would be expected to total 60,200 milligrams per litre (mg/L) at the Umwelt underground mine, 22,350 mg/L at the Llama underground mine, 12,000 mg/L at the Llama open pit, and 34,360 mg/L at the Goose Main underground mine.

Sabina indicated that all project components would be expected to interact with the groundwater environment to some degree, but that the continuous permafrost throughout the Goose Property would limit this interaction (see Section 4.6: Hydrological Features and Hydrogeology). Sabina highlighted modelling results which were used to design the Project's water management systems, and that inflows from the Umwelt, Llama, and Goose Main underground mines, as well as inflows to the Llama open pit, would be pumped to the Saline Water Pond during operations. Sabina indicated that no additional groundwater extractions are planned for the proposed Project. Additional information regarding mine dewatering was provided in the Volume 10, Section 7: Site Water Monitoring and Management Report.

Surface Water Quality

Sabina highlighted that project activities and components identified for their potential impacts on the freshwater environment were grouped by related project activities, shared pathways to the freshwater environment, and shared key water quality indicators. Sabina identified construction and decommissioning activities, winter ice roads, site contact water, mine contact water, water use, quarries and borrow pits, explosives, fuels, oils, polycyclic aromatic hydrocarbons, treated sewage discharge, and dust deposition as the project interaction groups for its effects assessment. To describe linkages between each project interaction group with the freshwater environment, Sabina identified runoff, water withdrawal, discharge, and aerial deposition as potential project interaction pathways.

As parameters for its analysis, Sabina adopted indicators from the contaminants of potential concern (COPC) identified in the CCME guidelines. The following seven (7) indicators were included as part of Sabina's assessment:

- pH
- Total Suspended Solids
- Nutrients
- Metals
- Hydrocarbons
- Biological Oxygen Demand
- Chloride and Cyanide

Sabina noted that mitigation and management measures were developed to prevent, avoid, minimize, offset, or restore freshwater quality on-site and within the spatial boundaries of the Project. Proposed mitigation and monitoring measures contained in the assessment included: optimized design and planning measures; application of control technologies; adoption of best management practices; monitoring and adaptive management measures; as well as measures to adhere to relevant federal and territorial regulatory guidelines. Additional information pertaining to Sabina's freshwater quality mitigation and monitoring plans, including its Aquatic Effects Management and Site Water Monitoring and Management plans, was provided in Volume 10 of the FEIS.

Using the identified indicators, relevant scientific literature, quantitative modelling, and professional judgement, Sabina predicted the occurrence of the following four (4) potential residual effects:

- Freshwater water quality changes from construction and decommissioning activities resulting from sediment introduction;

- Freshwater water quality changes due to site contact water;
- Freshwater water quality changes due to mine contact water; and
- Freshwater water quality changes due to the use of explosives and explosives residues.

Sabina predicted, contingent on the application of proposed mitigation measures, that the potential residual effects on the Freshwater Water Quality Valued Ecosystemic Component would be not significant. Sabina's significance determination was based on the predicted limited spatial extent (within the Goose Property LSA) of the potential residual effects, in addition to their expected reversible nature, sporadic and short to long-term duration, and low to moderate magnitude ratings.

Sabina outlined that low magnitude ratings were attributed to potential residual effects that had indicators within relevant CCME guidelines or less than 90% of baseline values if indicators were naturally greater than the respective threshold (e.g., arsenic). Moderate ratings were attributed to residual effects that had indicators greater than relevant CCME guidelines or greater than the 90% of baseline values if indicators were naturally greater than the respective threshold, but less than ten times the threshold. Sabina concluded that because the Project's potential residual effects would be confined to the LSA, no cumulative or transboundary effects would be expected on freshwater quality.

Sabina predicted that arsenic concentrations in small, localized areas in the western and southern parts of Goose Lake would rise above CCME guidelines during the closure phase of the Project, but would be at or below the site specific water quality objectives for Goose Lake. Sabina noted that these localized elevated concentrations would be a result of arsenic inputs from the Llama/Umwelt system (where the Llama and Umwelt open pits, waste rock storage areas, water management ponds, and Saline Water Pond would be located), the Goose Main Pit overflow, and upstream tailings facility/waste rock storage facility system. It was predicted that these localized areas would dilute rapidly and that arsenic concentrations would remain below the CCME guidelines in the main basin. Sabina further predicted that the highest predicted arsenic concentrations would occur at the beginning of the post-closure phase. For this case, the predicted arsenic concentrations were predicted to be greater than the CCME guideline throughout the lake during all seasons and at all depths. However, the values were predicted to remain below the water quality objective of 0.01 mg/L for the main basin of Goose Lake. The main input of arsenic contributing to Goose Lake concentrations was noted to be the overflow of the closed Goose Main Pit and the closure of the upstream Tailings Facility/Waste Rock Storage Area. It was concluded that the Llama/Umwelt system would also continue to contribute to arsenic loading during the closure period.

In Volume 6.4 of the FEIS Addendum, Sabina provided clarity concerning groundwater and surface water quality in response to the Board's concerns, as expressed in the 2016 Final Hearing Report, regarding the amount of baseline data that had been collected and the resulting limitations of the Aquatic Effects Management Plan (AEMP), in addition to concerns regarding arsenic management. Sabina noted that the additional information provided in the FEIS Addendum did not change its conclusions presented in the Groundwater (FEIS Volume 6, Chapter 2) or the Freshwater Water Quality assessments (FEIS Volume 6, Chapter 4) in the FEIS.

New information provided by Sabina in the FEIS Addendum included a revised AEMP (Volume 10, Chapter 19), and discussed in Volume 6.4 that this version of the document was fulfilling a term and condition recommended by the Kitikmeot Inuit Association (KIA) during the 2016 Final Hearing which requested Sabina to further develop the AEMP in conjunction with the KIA. Sabina also confirmed in

the FEIS Addendum that it would collect additional freshet and fall water quality data as recommended through a term and condition by the KIA during the 2016 Final Hearing.

Sabina noted in the FEIS Addendum and during the supplemental Final Hearing that arsenic is naturally occurring in rock and already present in water throughout the Local Study Area (LSA), and that the proposed milling process would not result in the conversion of the existing arsenic into arsenic trioxide which is the form of concern to parties. During the supplemental Final Hearing, Sabina emphasized that the proposed project infrastructure had been designed with arsenic management in mind, and indicated that comprehensive waste and water management and monitoring plans would be implemented to ensure the mine would not contribute to elevated arsenic in the area.[153]

In the FEIS Addendum, Sabina presented a new technical memo with a Site Specific Water Quality Objective (SSWQO) for arsenic (FEIS Addendum Appendix V6-4C). This technical memo utilized the 2007 Canadian Council of Ministers of the Environment (CCME) protocol as requested by the KIA in the 2016 Final Hearing. Whereas in the original FEIS Sabina had proposed a limit for arsenic of 0.01 mg/L, following additional analysis using the 2007 CCME protocol, Sabina presented a SSWQO for arsenic of 0.028 mg/L in the FEIS Addendum, which would be protective of 95% of aquatic organisms. During the supplemental Final Hearing, Sabina confirmed its intent to keep arsenic levels below 0.01 mg/L as originally proposed, rather than the substantially higher 0.028 mg/L identified within the new technical memo in the FEIS Addendum.

4.7.2 Views and Concerns of Interested Parties

The Kitikmeot Inuit Association (KIA), within its 2016 final written submission, noted concern that the proposed monitoring frequency for the aquatic environment would be insufficient to distinguish project impacts from natural variation in the receiving environment and recommended that Sabina commit to actively engage stakeholders as the Aquatic Effects Management Plan (AEMP) design is finalized to ensure it appropriately characterizes the receiving environment and potential impacts from project activities.[154] The KIA further recommended an increase in the AEMP sampling frequency to be in line with sampling frequency at other Arctic mines and noted that the NIRB may wish to incorporate aquatic sampling and frequency within the prospective project certificate. Finally, the KIA noted that the AEMP did not include the analytical detection limits that would be used during the aquatic monitoring programs and requested that the detection limits be added and be below the relevant guidelines for protection of aquatic life. In response to the 2016 final written submissions, Sabina noted that the plan for the overall AEMP study design is sufficient as presented within the FEIS; however stated that it would consider the recommendations and concerns raised by the KIA in the development of an updated design plan and will actively engage key stakeholders during the process. Sabina further noted that specific monitoring parameters and analytical detection limits are outside of the NIRB's jurisdiction and thus should not be included within the prospective project certificate. During the 2016 Final Hearing, the KIA noted within its presentation that it would be satisfied with a commitment from Sabina to work with the KIA to develop the AEMP and additional adaptive management thresholds prior to the first technical meeting as part of a Nunavut Water Board water licensing process.[155] Within Sabina's joint

[153] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 270, lines 8-17.
[154] Kitikmeot Inuit Association, 2016 Final Written Submission, March 10, 2016.
[155] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 639, lines 7-18.

submission with the KIA (Exhibit 93) submitted during the 2016 Final Hearing, Sabina committed to develop the AEMP and adaptive thresholds in conjunction with the KIA prior to the first technical meeting as part of the Nunavut Water Board (NWB) water licensing process.[156]

During the 2016 Final Hearing, Environment and Climate Change Canada (ECCC) noted similar associated issues with the AEMP. ECCC noted that there was a shortage of seasonal data for some of the baseline water quality data and requested a commitment from Sabina to add freshet and fall lake sampling to the AEMP. ECCC noted "…*[t]he need for that is to ensure we know what the extremes are as opposed to using one number to represent the average for a whole year*." ECCC further indicated that the data "… *would be important for future comparisons in the monitoring program, and could be used in future to validate model predictions as [Sabina] update [its] model with real world data*."[157] Following the presentation by ECCC, the KIA requested clarification on the reasoning for requesting data collection from lakes during the freshet and fall periods for construction and operations.[158] ECCC responded by noting the importance of having a robust baseline data set which would require a range of variability of the system that could potentially be affected. Sabina also requested clarification from ECCC on the request for additional baseline data, whether the purpose of this data was to ensure adequate information for monitoring purposes and the timing of collecting this data.[159] ECCC noted that the purpose of the additional baseline data would be to provide retrospective confirmation of the impact assessment conclusions and to update the water quality models for the licensing stage.[160]

The KIA noted within its 2016 final written submission concerns with respect to using detection limits that were above the Canadian Council of Ministers of the Environment (CCME) quality guidelines for some of the parameters which may preclude accurate comparisons between predictions put forward in the FEIS and environmental concentrations through the life of the Project. The KIA recommended that all aquatic monitoring be conducted using detection limits below the parameter specific CCME quality guidelines for the protection of aquatic life.

In response, Sabina noted that the baseline data used for the effects assessment was deemed sufficient by using detection limits that were above the CCME guidelines. Sabina further noted that some groundwater baseline data did have analytical detection limits greater than CCME water quality guidelines for the protection of aquatic life in the receiving environment; however, this data was suitable for inclusion in the quantitative water and load balance modeling because of the conservative assumption that observations less than analytical detection limits were equal to 0.5 times the detection limit. Sabina indicated that it did not agree that it is necessary to utilize detection limits below the parameter specific CCME water quality guidelines for all aquatic monitoring on-site as suggested by the KIA.

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[156] Sabina and Kitikmeot Inuit Association Joint Submission, Exhibit 93, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.

[157] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 445-446, lines 15-26 and 1-12.

[158] R. Nesbitt, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 454-455, lines 24-26 and 1-5.

[159] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 457-458 and 458, lines 23-26, 1-5 and 23-26.

[160] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 458 and 459, lines 7-20 and 3-6.

The KIA further noted within its 2016 final written submission that the Proponent derived a site specific water quality objective (SSWQO) for arsenic that used an approached that was not approved by the CCME and did not consider recently generated chronic toxicity data. The KIA noted that Sabina should not apply the proposed SSWQO to the Back River project and that additional treatment for arsenic should be explored to ensure that the residual concentrations of arsenic are below the CCME water quality objective of 0.005 mg/L. The KIA further indicated that if Sabina is not able to reduce arsenic below the CCME guidelines in Goose Lake during the post-closure period, the impact to Goose Lake should be classified as "irreversible".[161]

In response, Sabina considered the proposed SSWQO to be sufficient as an assessment threshold for residual effects to water quality and committed to further developing the SSWQO for arsenic during the water licence process in consultation with regulators and stakeholders. For the longer term predicted concentrations in Goose Lake, although modestly greater than the CCME guideline during winter, Sabina indicated that the concentrations were not expected to have irreversible effects to primary and secondary producers. Sabina added that arsenic toxicity to plants appeared to be associated with photosynthesis and the generation of reaction oxygen species; however, low-light conditions experienced by phytoplankton in winter are expected to mitigate potential effects from arsenic. Sabina stated that the seasonality of the predicted arsenic concentrations, combined with the low relative abundance of potentially sensitive taxa and higher relative toxicological thresholds, indicated that the residual effects of arsenic on Goose Lake would not be significant.

During the 2016 Final Hearing, ECCC noted that it would be important for Sabina to develop site specific surface water objectives and guidelines in addition to comparing the results to both the Metal Mining Effluent Regulations (MMER) and CCME guidelines for the protection of aquatic life, specifically for arsenic and copper values.[162] ECCC also noted concern with respect to the potential arsenic concentrations within Goose Lake, particularly at closure. ECCC also stressed the importance of ongoing monitoring during construction, operations and closure to be able to track the source of arsenic concentrations in Goose Lake, to verify the predictions that were made, and to ensure mitigation measures would be put in place.[163]

The KIA also noted concern with regards to the site specific water quality objective for arsenic during the 2016 Final Hearing, specifically with respect to the elevated levels predicted in Goose Lake and the potential impacts to the aquatic life at the closure phase of the Project. The KIA questioned Sabina on the topic as follows:

> *So our question is: Can Sabina comment on the potential impacts of the proposed arsenic, in particular concentrations, in Goose Lake to the inherent water quality of that receiving environment, as well as the aquatic resident species that will be there and the methodology they've currently used to derive the proposed site-specific water quality objective?*[164]

[161] Kitikmeot Inuit Association, 2016 Final Written Submission, March 10, 2016.
[162] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 128-129, lines 22-26 and 1-12.
[163] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 446, lines 16-26.
[164] R. Nesbitt, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 132-133, lines 3-17, 21-26 and , and 1-2.

In response, Sabina indicated that the assessment of effects from the mine on water quality and aquatic life in the receiving environment as laid out in the FEIS was sound as it was based on quantitative modelling. Sabina added that modelling results showed that there would be residual effects to the water quality for Goose Lake but that the predicted concentrations of arsenic would be less than any known toxicological threshold. Sabina acknowledged that the methodology for the derivation of the site-specific water quality objective did not follow the CCME guidelines; however, it noted that the evaluation was designed to serve as an assessment threshold and the predicted concentrations of arsenic were well below any threshold for fish, invertebrates, or primary producers. Sabina noted that for its water quality assessment, potential residual effects to Goose Lake were identified as the water quality model predicted increases in arsenic. However, Sabina stressed that the predicted concentrations of arsenic were substantially less than any known toxicological thresholds but acknowledged that arsenic toxicity in the aquatic environment is not well known.[165] The KIA continued to note concern that Sabina did not follow the CCME guidelines and requested Sabina "*provide some more justification for why the proposed long-term impacts to Goose Lake are considered low and why the effects are reversible, and more broadly, what the potential impacts are to the aquatic life in the absence of strong evidence showing that there will be no impact?*"[166] In response, Sabina re-iterated its confidence in its assessment methodology, noting that it was sufficient and that predicted effects to Goose Lake from the Project in the longer term would ultimately be reversible based on the quantitative modelling that was completed.[167] The KIA indicated that there is disagreement on this topic and requested an offline discussion with Sabina with follow-up provided during the hearing.

During its presentation at the 2016 Final Hearing, the KIA expressed concern again with respect to Sabina's projected arsenic levels for Goose Lake nearing the end of mine life and the use of a SSWQO instead of the CCME guidelines for arsenic. The KIA recommended a term and condition to address this concern.[168] In response, Sabina agreed to resolve the concern with respect to the SSWQO for arsenic during the regulatory phase and noted that the Nunavut Water Board has previously set site-specific objectives for arsenic for other sites.[169] Within Sabina's joint submission with the KIA (Exhibit 93) submitted at the 2016 Final Hearing, Sabina committed to work with the KIA to develop a site-specific water quality objective for arsenic that is satisfactory to both the KIA and ECCC. This would be done before the first technical meeting as part of the Nunavut Water Board water licencing process.[170,171] During its closing remarks, ECCC acknowledge its support for this commitment.[172]

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[165] B. Beall, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 133-135, lines 14-26, 1-26 and 1-15.

[166] R. Nesbitt, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 137, lines 17-23.

[167] B. Beall, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 137-138, lines 26 and 1-23.

[168] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 639-641, lines 19-26, 1-26 and 1-3.

[169] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 652-653, lines 4-26 and 1-9.

[170] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1079, lines 17-23.

[171] Sabina and Kitikmeot Inuit Association, Joint Submission, Exhibit 93, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.

[172] L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1368, lines 8-25.

In its 2016 final written submission, the KIA indicated that insufficient supporting water quality data had been used as inputs for the water quality model in the Water and Load Balance Report. The KIA noted that modelling results, as presented in the report, were relied on by Sabina to predict the potential impacts, including residual effects, of the Project on the freshwater aquatic receiving environment at each stage of the Project. The KIA noted that the incorporation of inappropriate data or assumptions may result in the over- or under- prediction of the Project's potential effects and recommended that Sabina should summarize water quality data used for the model seasonally and include descriptive statistics for each parameter. In its response to the 2016 final written submissions, Sabina described the methodology used for the water quality model inputs, noting that the data was analyzed for seasonal variations; however none were identified. Sabina also provided an attachment with the raw data and the selected statistics used for each parameter for the water quality model. During its presentation at the 2016 Final Hearing, the KIA noted concern with respect to seasonal effects not being reflected in the data used to predict impacts on the freshwater receiving environment. The KIA stated it would be satisfied with a commitment from Sabina to collect additional baseline water quality data from the lakes in the project area during freshet and fall as confirmed by measurements of higher flow prior to construction, and to use this data accordingly to update its water and load balance models.[173] Within Sabina's joint submission with the KIA (Exhibit 93) submitted during the 2016 Final Hearing, Sabina committed to adding more water quality data from the lakes in the project area during freshet and fall prior to construction. This data would be used to update the water and load balance model.[174,175] During its closing remarks, ECCC acknowledge its support for this commitment.[176]

The KIA further noted in its 2016 final written submission that Sabina compared post-closure water quality in the pit lakes and at prediction node PN10 to MMER water quality criteria rather than CCME water quality objectives. It was recommended that Sabina use the CCME water quality guidelines instead of the MMER criteria as these areas are potential aquatic habitat. The KIA further requested that Sabina provide a discussion on how the exceedances of the CCME guidelines at the end of mine life would alter the conclusions of no residual effects on the freshwater Valued Ecosystemic Component. In response to the request, Sabina noted that the intent is not to have the flooded pit lakes recolonized by aquatic organisms and reintroduced as fish habitat beyond post-closure. Sabina clarified that all potential fish use would be prevented by creating fish barriers prior to ice melt at all migratory pathways into pit lakes connected to fish bearing habitat.

During the 2016 Final Hearing, ECCC further requested confirmation from Sabina on whether additional studies of under-ice-conditions, as well as additional winter sampling, would be conducted to capture seasonal variability and to enhance the baseline data set as part of the AEMP.[177] Sabina responded by noting that there are three (3) to four (4) years of baseline data available and that it did not intend to

[173] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 641, lines 4-14.
[174] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1080, lines 14-18.
[175] Sabina and Kitikmeot Inuit Association, Joint Submission, Exhibit 93, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[176] L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1368, lines 8-25.
[177] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 130, lines 3-9, 17-21.

commit to additional sampling prior to construction.[178] ECCC further requested clarification on the timing of when the environmental effects monitoring (EEM) under the MMER would be triggered and how it would be harmonized with the AEMP. This was again reiterated during ECCC's presentation at the 2016 Final Hearing.[179,180] In response, Sabina noted that the EEM monitoring would likely be triggered during the construction period.[181]

Indigenous and Northern Affairs Canada (INAC) noted within its 2016 final written submission that the Proponent compared dissolved metal concentrations to total metal concentrations CCME guidelines and MMER limits for all open pits and downstream prediction points.[182] INAC noted that this may have under-estimated actual total metal concentrations at the mine site which may not be appropriate for determining compliance with the CCME guidelines and MMER limits and may not be sufficient for determining treatment requirements and other mitigation measures. INAC recommended that the Proponent re-evaluate the load balance model predictions and update predictions and associated mitigation measures as required. In response, Sabina acknowledged that during the NWB water licencing regulatory phase, modelling of total metals may be required to help establish appropriate discharge criteria for the site, and noted that it would consider adding total metals to the model at that stage of the Project. During its presentation at the 2016 Final Hearing, INAC noted that it was satisfied with Sabina's approach; however, it requested that a commitment be developed to reflect Sabina's consideration of adding total metals analysis to its water quality model during the licencing phase.[183] Within Exhibit 84 submitted during the 2016 Final Hearing, Sabina committed to modeling of total metal concentrations, as may be required to establish appropriate discharge criteria and predict downstream compliance. For parameters not requiring total metals modeling, appropriate justification would be provided by Sabina. This information is expected for review as part of the Nunavut Water Board Type "A" Water Licence Application.[184]

Within its 2016 final written submission, INAC commented on the discrepancies between the DEIS and FEIS Umwelt pit water quality model results and noted that the discrepancies created uncertainty in whether there would ultimately be a residual effect on water quality which would need to be mitigated during operations and potentially well into the post-closure period. INAC noted that to gain better confidence in the FEIS model results and impact assessment it would be useful to know what, if any, changes in modeling assumptions were employed in the two (2) model applications. INAC indicated that if pit water quality is predicted to deteriorate over the long-term, the Proponent should explain how it would be mitigated. In written response to the final submissions, Sabina provided a summary comparison of the modelling methods and/or assumptions made to explain differences noted in the results. Sabina further noted that in re-reviewing the model inputs in preparation to respond to INAC's

[178] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 130, lines 11-15 and 10-19.
[179] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 131, lines 1-8.
[180] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 447, lines 1-4.
[181] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 131, lines 10-18.
[182] Indigenous and Northern Affairs Canada, 2016 Final Written Submissions, March 7, 2016.
[183] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 557-558, lines 14-26 and 1-10.
[184] Federal Departments Submission, Exhibit 84, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.

request, a minor discrepancy was identified between the source terms developed for the Umwelt pit walls, and those used in the current water and load balance model. Sabina further outlined that the issue identified had a negligible effect on water quality in the Umwelt Pit Lake because the pit walls would only contribute one percent (1%) of the total flows to the Umwelt Pit under post-closure conditions and therefore, the results of the effects assessment remain valid. Sabina indicated that this minor discrepancy was only in regards to Umwelt pit wall sources and that, all other pit wall sources were appropriately captured in the model and predictions for the other pits were unaffected. However, for completeness, Sabina noted that the FEIS model results were updated and provided in the response. During its presentation at the 2016 Final Hearing, INAC noted that Sabina provided appropriate justification for the differences in the two (2) models. INAC further acknowledged that Sabina had committed to monitor water quality of the pit sump to validate the results and implement mitigation measures should monitoring show that the pit walls are a source of loading than indicated by current model results. INAC recommended that Sabina commit to providing details, during the Nunavut Water Board water licencing phase, of the options for mitigation should actual results differ from the current modelling predictions.[185] Within Exhibit 84 submitted during the 2016 Final Hearing, Sabina committed to monitor water quality of the pit sump to validate water quality predictions and implement mitigation should monitoring show that pit walls are a more appreciable source of loading than indicated by current modeling. Further, Sabina committed to providing details of options for mitigation for review as part of the Type "A" Water Licence Application.[186]

Within its 2016 final written submission, INAC indicated that information on ammonia removal from wastewater was not provided, noting the importance of this information as ammonia is toxic to aquatic life. INAC stressed the importance to confirm that appropriate treatment would be in place, particularly in the event of a prolonged temporary closure or early closure. ECCC also noted concern that ammonia concentrations in site water may be underestimated by not including contributions from all blasting agent sources and recommended re-modelling and re-evaluation of nitrogen species concentrations in site water.[187] In response to the requests, Sabina re-summarized the water treatment that is being proposed to manage mining impacted water, noting that the treatment process is a simple proven technology used effectively at many gold mining operations. With respect to ammonia concentrations in site water, Sabina noted that it would be removed from the process water circuit by natural degradation and that the ammonia concentration predictions from all sources in the site water were incorporated into the water and load balance model, including sources such as blasting residues. With respect to the potential event of an early closure or care and maintenance, Sabina indicated that water would be treated using the same method as described to manage the impacted water during operations. During the 2016 Final Hearing, ECCC noted that its concerns were addressed and that the appropriate model inputs were used for ammonia and that ongoing monitoring would be used to confirm the predictions.[188] During its presentation at the 2016 Final Hearing, INAC noted that Sabina provided additional clarification on the treatment options in relation to temporary and early closure; however, little information was provided on the treatment of spills, accidents or malfunctions. INAC recommended Sabina commit to incorporating allowances for abnormal operating conditions, including

[185] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 558-559, lines 11-26 and 1-8.
[186] Federal Departments Submission, Exhibit 84, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[187] Environment and Climate Change Canada, 2016 Final Written Submissions, March 9, 2016.
[188] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 444, lines 6-13.

spills and accidents and malfunctions, in the treatment design criteria with the information provided at the water licencing application phase, as well as provide this information for review.[189] Within Exhibit 84, submitted during the 2016 Final Hearing, Sabina committed to providing additional information on the proposed mine waste water treatment plant to show that adequate treatment capacity is in place, and that there is sufficient capacity available to address spills, accidents, and malfunctions. This information was committed to be provided for review as part of the Nunavut Water Board Type "A" Water Licence Application process.[190]

INAC further indicated that contaminated water from Waste Rock Storage Areas (WRSA) may transport through the active layer into the ambient environment since overburden within the storage areas may not be able to freeze-back during the early stage of construction. INAC noted that this could lead to contaminated water from potential acid generating (PAG) and potential metal leaching waste rock moving through the overburden active layer into the environment. INAC recommended that Sabina develop a shallow groundwater quality monitoring program in the active layer surrounding the WRSAs, and also recommended, if required, that the groundwater should be intercepted and managed as part of the overall Site Water Management Plan. In response, Sabina indicated that all the WRSAs would be located on permafrost terrain and therefore it did not expect that there would be deep groundwater pathways. Sabina noted that a shallow perched water table may result from the presence of a seasonal active later, and indicated that it designed contact water ponds for each WRSA under the assumption that all WRSA surface contact water would need to be contained. Sabina further noted that there would be no opportunity for the perched shallow groundwater from the active layer to impact the environment beyond the existing containments systems. As a result, Sabina indicated that there would be no requirement for additional shallow groundwater monitoring. However, Sabina added that as part of regular project operations, performance of these contact water ponds would be monitored and adaptively managed as appropriate to ensure runoff from WRSAs would be appropriately captured within the Project's site water management system. During its presentation at the 2016 Final Hearing, INAC indicated that it reviewed the plans provided by Sabina for containing the runoff from the WRSAs and stressed the importance of monitoring downstream of these structures to assess the performance of the facilities. INAC recommended that Sabina develop a monitoring program with the capability of detecting impacts that may not have been accurately captured within the waste rock management plan and to provide the details as part of the water licence application.[191] In response, Sabina noted that it had been in discussion with INAC and they had come to an agreement on the wording for a commitment which was supplied in Exhibit 84 during the 2016 Final Hearing.[192,193]

INAC also noted within its 2016 final written submission that no information was provided on how the Proponent would manage contact water at the Marine Laydown Area (MLA). INAC indicated that while Sabina determined that there would be no impact on the water quality of Bathurst Inlet, however, it did not account for potentially contaminated runoff from the MLA. INAC stated that because no plan was

[189] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 559-560, lines 9-26 and 1-5.
[190] Federal Departments Submission, Exhibit 84, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[191] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 568-569, lines 23-26 and 1-13.
[192] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 580-581, lines 18-26 and 1-4.
[193] Federal Departments Submission, Exhibit 84, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.

proposed to monitor or manage this runoff, it was difficult for INAC to agree with Sabina's assessment. INAC noted that for the Proponent to protect the aquatic environment, it needs to demonstrate that the necessary water management infrastructure would be in place at the MLA to allow monitoring, treatment, and containment of potentially contaminated runoff. INAC further recommended that the water management designs at the MLA be updated to be consistent with how 'contact' water is addressed throughout the mine site. In response, Sabina noted that the non-contact water would be diverted around MLA infrastructure to maintain local drainage patterns while limiting contact water volume at the site. The contact water from pads and roads would flow to the Bathurst Inlet along pre-development ephemeral flow paths where it would mix with non-contact water. Sabina further noted that in order to understand the effect of constituent loading from contact water (i.e., from road and rock pads constructed from geochemically suitable sources at the MLA), a water and load balance model was prepared to estimate dilution capacity at the MLA. Sabina outlined that the results from the model indicated that concentrations of arsenic and mercury would be below the CCME guidelines for marine aquatic life. Thus, Sabina noted that no additional water management structures would be required. During its presentation at the 2016 Final Hearing, INAC indicated that it was satisfied with Sabina's written response to the concern related to the management of contact waters at the MLA.[194]

Within its 2016 final written submission, Transport Canada (TC) noted that sections 21 to 23 of the *Navigation Protection Act* (NPA) apply to all waterways that are navigable, and recommended that Sabina submit a notice of works to the Navigation Protection Program (NPP) for any dewatering activities so that a navigation assessment could be completed. TC added that the navigation assessment would apply to both the Umwelt and Llama lakes, as they would be dewatered and used for saline water or tailings storage, respectively.[195] In response to the 2016 final written submissions, Sabina acknowledged the requirements as noted by TC. During its presentation at the 2016 Final Hearing, TC noted that Sabina committed to providing the information as requested and it was satisfied with Sabina's associated commitments.[196] During the 2016 Final Hearing, the Board staff requested clarification on whether the lakes identified for proposed dewatering as part of the Project qualify as navigable waters and whether they would require an approval of exemption from TC in accordance with the NPA.[197] In response, TC noted that the prohibitions under sections 21 to 23 of the NPA apply to all navigable waters in Canada; however, it would be Sabina's responsibility to provide detailed information on the lakes in question to enable TC to make its determination on the applicability of sections 21 to 23.[198] Following a request by the Board staff to clarify its intention to submit information or to comply with the potential TC regulatory requirements, Sabina indicated that it intends to submit the necessary information to TC during the regulatory phase of the proposed Project. Sabina further noted that it submitted preliminary documentations related to the Goose Property waterbodies and that information on the remaining waterbodies would follow the same format.[199]

[194] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 560, lines 6-16.
[195] Transport Canada, 2016 Final Written Submissions, March 7, 2016.
[196] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 534, lines 9-22.
[197] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 543, lines 4-10.
[198] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 543, lines 13-20.
[199] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 545, lines 1-10.

During the 2016 Final Hearing, a Community Representative from Cambridge Bay noted concerns with respect to waterbodies in the area and asked Sabina if it was aware of any waterbodies or streams that go underground.[200] It was later clarified that the Community Representative requested clarification on whether surveys were completed on creeks or groundwater throughout the entire mine area. Sabina responded, noting that sampling programs were completed within the footprint of the proposed activities.[201]

A Community Representative from Taloyoak requested clarification on how chemicals, such as arsenic, at the site would be disposed of and how fuel would be disposed of following closure. The Community Representative requested further clarification on whether the fuel and chemicals would be shipped down south, how they would be shipped, and how long it would take following closure.[202] A Community Representative from Wekweètì raised similar concerns with respect to how the chemicals would be transported out from the mine at closure.[203]

A Community Representative from Gjoa Haven noted concern with respect to contaminants from the mine site entering the freshwater environment:

> *This concerns about the rain and snow contamination. So, like, of course it'll rain and snow, but if it rains and snows on something bad and that rain will eventually seep into the ground or stream into a river or stream into a lake or if you, by chance -- which hopefully won't happen --*[204]

Sabina noted that any rain and snow that comes within contact with the site would be collected and treated as contact water.

A Community Representative noted concern with respect to watersheds within the Goose Property and around Hope Bay and requested that research be conducted on water quality to determine if the area's lakes and creeks are contaminated as no fish had been caught in the Ellice River area during the past fall season.[205] Sabina noted that up to four years of water quality data and fish studies have been collected.

Within their respective final written submissions on the FEIS Addendum, several parties commented on water quality monitoring, and proposed revisions to Sabina's new Aquatic Effects Management Plan (AEMP). The Kitikmeot Inuit Association (KIA) recommended the following modifications to the AEMP:

- Sample at least one (1) full year of seasonal data prior to the construction phase to ensure adequate baseline data;
- Modify the proposed location of certain samples to ensure water quality is accurately characterized;

[200] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 813, lines 1-10.
[201] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 819, lines 3-9.
[202] J. Ashevak, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 834-835, lines 16-26 and 1-5.
[203] J. Judas, Wekweètì, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 956, lines 1-15.
[204] J. Tikkiruq, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 921, lines 1-6.
[205] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 932-933, lines 13-26 and 1-3.

- Conduct at least three (3) open water samples times per year at near and mid field sites;
- Measure physiochemical parameters (e.g., temperature, dissolved oxygen, pH, and conductivity) in the receiving environment;
- State what benchmarks and triggers would be used to assess change and implement adaptive management; and
- Include zooplankton in the monitoring program to assess the effectiveness of the Site Specific Water Quality Objective (SSWQO) for arsenic.

The KIA concluded in its final written submission on the FEIS Addendum that needed improvements to the AEMP would be best addressed during the Nunavut Water Board water licensing phase.

In its response to the final written submission on the FEIS Addendum from the KIA, Sabina agreed to the KIA's suggested modification of a joint condition or commitment proposed during the 2016 Final Hearing to include the phrase "the Proponent will ensure sampling is an appropriate and accurate representation of at least one (1) full year of seasonal data." Sabina also noted it has no issue with adjusting the locations of the proposed water quality sampling stations and indicated it would work with the KIA to fully develop the AEMP during the regulatory phase, as previously committed to during the 2016 Final Hearing. With respect to sampling frequency, Sabina stated that it plans to monitor four (4) times per year in the exposure and reference areas and two (2) times per year in all other areas, and that this frequency is in line with the Metal Mining Effluent Regulations requirements. Sabina indicated that monitoring more frequently in the mid-field area would not be necessary at this time, but agreed to discuss the issue further with the KIA and Environment and Climate Change Canada (ECCC) during the regulatory phase. In terms of sampling parameters, Sabina noted it already planned to sample physiochemical profiles but agreed this could be stated more clearly in the AEMP. Lastly, with regards to benchmarks and triggers, Sabina indicated that these can be further discussed and finalized between Sabina, the KIA, and ECCC during the regulatory phase and following collection of additional baseline data. Sabina indicated it would submit benchmarks for approval at least six (6) months prior to any planned discharges to the receiving environment.

During the supplemental Final Hearing, the KIA indicated that based on Sabina's commitments to expand baseline data collection and refine the AEMP during the licensing phase, it was confident the environmental impacts of the issue would be understood and would be mitigable or manageable. [206]

Within its final written submission on the FEIS Addendum, Indigenous and Northern Affairs Canada (INAC) confirmed that while it had raised several issues relating to ground and surface water quality in its 2016 final written submission on the FEIS, it was satisfied with Sabina's responses, on the condition that several commitments proposed during the 2016 Final Hearing are adhered to during the licensing stage. INAC clarified that the level of detail presented in the FEIS in combination with the proposed commitments was appropriate for the environmental assessment stage and adequately addressed the potential for impact. These commitments made in 2016 included the following:

- Model total, rather than dissolved metal concentrations (the former are what CCME and Metal Mining Effluent Regulations limits are based on);

[206] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 422-425, lines 19-26, 1-26, 1-26 and 1-3.

- Monitor pit sump water quality and provide potential mitigation options should monitoring show it necessary;
- Provide additional information on the waste water treatment plant; and
- Include a plan to monitor contact water from the WRSF.

In its response to INAC's final written submission on the FEIS Addendum, Sabina confirmed its commitment to these four (4) terms and conditions and/or commitments proposed during the 2016 Final Hearing. INAC confirmed during the supplemental Final Hearing that it considered the issue resolved.[207]

ECCC also commented on the new AEMP presented in the FEIS Addendum. Numerous specific comments were provided in ECCC's final written submission on the FEIS Addendum regarding: sampling location, frequency, and timing; sampling protocol; the subjects and parameters to be monitored; and the statistical methods:

- The "after" sampling effort should be at least as frequent and comparable to "before" sampling as possible;
- Include details of how the baseline dataset is to be added to prior to construction;
- sampling locations for Slimy Sculpin should be re-evaluated;
- Maintain consistent sampling frequencies;
- Clarify and correct lake trout sampling locations in Tables 4.3-3 and 4.3-4;
- Sample for water sampling in conjunction with the lake trout non-lethal survey;
- Follow the Environmental Effect Monitoring Guidance Document;
- Routine sampling of fishes at locations BRP-35 and BRP-36 should only occur if modeling shows that effluent is measurable at those locations;
- Water quality sampling should occur in each calendar quarter;
- Add turbidity, pH, fluoride, and total organic carbon, and total phosphorus to the list of parameters to be monitored;
- Identifying what statistical methods will be used to evaluate potential differences;
- Sampling for metals in the surficial sediments and use methods that are consistent with baseline to the extent possible. If necessary further baseline samples should be collected which analyze the top 1-2 cm only;
- Specify the method for Particle Size Analysis;
- Reduce the frequency of fish sampling when not required under the MMER EEM;
- Reword to say "outside" rather than "greater than" normal range; and
- Tie the low action level to differences that are statistically significant for comparisons to baseline and/or reference sites.

[207] R. Theoret-Gosselin, Indigenous and Northern Affairs Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 523-524, lines 22 –26 and 1-5.

ECCC also recommended that it be clearly stated that the AEMP would be carried out on an annual basis with annual sampling and reporting. ECCC recommended these revisions to the AEMP be made prior to the submission of the water licence application and early enough to allow time to collect any necessary predevelopment data. In its response to ECCC's final written submission on the FEIS Addendum, Sabina stated that it appreciated the recommended enhancements to the AEMP and committed to addressing these during the regulatory phase.

ECCC emphasized the issue regarding timing of data collection and monitoring during the supplemental Final Hearing, asking Sabina to clarify if it would be willing to collect additional baseline data prior to the regulatory phase to support the ability to determine impacts.[208] Sabina responded in the affirmative and indicated it had started to look at what baseline data is missing. Sabina noted that both 2017 and 2018 would potentially be available to collect additional data.[209] Subsequently, ECCC acknowledged Sabina's commitment to advance the AEMP prior to the licensing phase as per ECCC's recommendations, and concluded that it was satisfied with this response and had no further concerns.[210]

Through final written submissions and during the supplemental Final Hearing, parties also commented on Sabina's new SSWQO for arsenic. INAC indicated in its final written submission on the FEIS Addendum that the FEIS assessment related to arsenic concentrations is likely conservative and acceptable at this stage of assessment, while acknowledging the SSWQO is subject to acceptance by ECCC. ECCC meanwhile identified some concerns in its final written submission on the FEIS Addendum regarding the approach to develop the SSWQO as presented in the FEIS Addendum. Specifically, ECCC was concerned that *Daphnia pulex* showed effects at a lower level than the proposed objective of 0.028 mg/L. ECCC also questioned the relevance of including toxicity to amphibians in the calculations. ECCC did not detail these concerns during the supplemental Final Hearing and acknowledged that Sabina had confirmed its intent to use the original site-specific objective of 0.01 mg/L that was proposed in the FEIS.[211] ECCC confirmed during its technical presentation at the supplemental Final Hearing, as well as following the KIA's technical presentation, that it supports the use of the original FEIS limit of 0.01 mg/L, and indicated that further work on a site-specific water quality objective would not be necessary, if the KIA agreed.[212,213] The KIA confirmed in both instances that it agreed with ECCC and that the commitment for the SSWQO proposed during the 2016 Final Hearing should be removed.[214,215] INAC

[208] A. Wilson, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 276-277, lines 15-26 and 1-3.
[209] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 277, lines 7-21.
[210] A. Wilson, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 488, lines 1-10.
[211] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 278, lines 13-15.
[212] A. Wilson, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 487, lines 2-9.
[213] A. Wilson, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 435, lines 13-21.
[214] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 435, lines 25-26.
[215] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 489, lines 23-25.

subsequently indicated that it too recommended using the original water quality objective of 0.01 mg/L for arsenic and no longer considered the issue a concern.[216]

During the supplemental Final Hearing, a Community Representative from Omingmaktok (Bay Chimo) asked Sabina to clarify the process for disposing of treated pond water. In response, Sabina explained that the process of treating the water would result in a residue that would be classified as a hazardous material and that the material would be collected and shipped to a treatment facility off-site.[217] A Community Representative from Behchokǫ̀ later asked Sabina to clarify what would be contained in the tailings pond if the hazardous material would be shipped south.[218] Sabina replied that tailings essentially consist of ground-up rock, and are not classified as a hazardous material because all the chemicals would be extracted prior to deposition of material into the tailings facility.[219] A Community Representative from Taloyoak further asked Sabina to clarify how sewage would be treated and where hazardous wastes would be sent.[220] Sabina replied that all hazardous waste including sewage would be sent off-site (via Hay River or via Montreal) to an appropriate treatment facility, with documentation to track it the entire time.[221]

During the supplemental Final Hearing, a Community Representative from Cambridge Bay asked the KIA whether water sampling would include the Ellis River, which runs from Goose Lake through the Queen Maud Gulf, noting that the Ellis River watershed and river is used by residents for fishing in both summer and winter.[222] The KIA replied that it understands there is a sampling station at the outflow of Goose Lake and that should capture any effects from the project exiting Goose Lake.[223] Sabina subsequently confirmed this, noting that sample stations are generally located as close to the mine site as possible to understand project-specific effects. Sabina stated that there is no sample station right at the mouth of the river, and suggested that due to its distance from the project site and with other rivers and streams feeding in, that any potential contaminants would likely be diluted and not measurable at the Ellis River. However, Sabina confirmed that if the proposed sampling stations did pick up any issues, then adaptive management would be triggered, and Sabina could potentially start sampling other locations.[224]

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[216] R. Theoret-Gosselin, Indigenous and Northern Affairs Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 524, lines 6-13.

[217] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 662, lines 16-22.

[218] T. Steinwand, Behchokǫ, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 717-718, lines 25-26 and 1.

[219] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 720-721, lines 7-26 and 1-3.

[220] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 695, lines 3-11.

[221] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 697-698, lines 16-26 and 1-12.

[222] J. Haniliak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 863, lines 12-26.

[223] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 864, lines 7-11.

[224] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 864-865, lines 17-26 and 1-10.

4.7.3 Views of the Board

During the 2016 Final Hearing, the Board requested clarification on Sabina's proposed gold extraction process, the use of arsenic, and how the process would be different compared to other mine sites in the past, particularly with respect to arsenic trioxide that was left at the Giant Mine in the Northwest Territories.[225] In response, Sabina noted that its proposed extraction process (conventional milling) would be different than that used at the Giant Mine (roasting) in the Northwest Territories due to differences in ore characteristics between the Back River area (non-refractory) and the Giant Mine area (refractory). Sabina added that by using conventional milling processes at the Back River Gold Mine site, naturally-occurring arsenic in the ore would not be converted to arsenic trioxide.

In the 2016 Final Hearing Report, the Board highlighted considerable uncertainty in relation to arsenic management at the site as a result of the elevated naturally occurring arsenic associated with the Project Development Area and lack of clear criteria for setting and assessing water quality objectives for arsenic. The Board noted that parties raised concerns with respect to Sabina's proposed Site Specific Water Quality Objective (SSWQO) for arsenic, specifically with respect to the elevated levels predicted in Goose Lake and the potential impacts to the aquatic life at the closure phase of the Project. As noted by parties, the proposed SSWQO was calculated using an approach not approved by the Canadian Council of the Ministers of the Environment (CCME), was higher than the CCME water quality objectives, and did not consider recently generated chronic toxicity data. The Board acknowledged that Sabina committed to work with the Kitikmeot Inuit Association (KIA) to develop a site-specific water quality objective for arsenic that would be satisfactory to both the KIA and Environment and Climate Change Canada (ECCC). However, the Board concluded in 2016 that the issue should be addressed prior to the completion of the impact assessment to ensure that a precautionary approach is taken in relation to considerations of surface water specifically to Goose Lake during the post-closure period.

After reviewing the new information provided by Sabina in the FEIS Addendum, and following discussions between the Proponent and Parties during the supplemental Final Hearing, the Board understands Sabina is committed to using the lower SSWQO for arsenic of 0.01mg/L originally proposed in the FEIS. The Board is satisfied with this decision; however, the Board stresses the importance of ongoing monitoring to ensure mitigation measures are implemented where necessary.

In addition to the SSWQO for arsenic, in the 2016 Final Hearing Report, the Board noted that Parties had considerable concerns with Sabina's Aquatic Effects Management Plan (AEMP). Based on the comments made by the KIA and ECCC in their 2016 final written submissions and during their presentations at the 2016 Final Hearing, the need for amendments to the AEMP became evident, as did the need to undertake sampling and monitoring to collect adequate seasonal baseline data to appropriately characterize the receiving environment and the potential impacts from project activities. The Board concluded in the 2016 Final Hearing Report that there was considerable uncertainty in relation to the effects predicted for ground and surface water quality due to the limited development of the AEMP, which was restricted by insufficient seasonal baseline data on which to plan appropriate mitigation measures. The Board noted that addressing these issues is critical to ensure that adequate data are available to assess impact predictions, and inform the appropriate development of adaptive management strategies if required.

[225] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 911, lines 3-12.

During the supplemental Final Hearing, a Board member asked for clarification following discussions about water sampling of Goose Lake and at the Ellis River, which flows into Queen Maud Gulf. Specifically, the Board member asked if the Proponent would be conducting complete water sampling at the Goose Lake outflow prior to beginning operations, during mining operations, and post-mining.[226] The KIA noted in response that it is aware that Sabina has been conducting extensive baseline studies for the Project and has submitted an AEMP. The KIA confirmed that the outflow of Goose Lake to be the best place for water sampling as all water would flow out through there and any issues could be detected at that point.[227] Sabina confirmed that there have been six (6) years of baseline studies, with samples conducted at Goose Lake and Propeller Lake and the outflow, and that the AEMP, reviewed by both ECCC and the KIA, requires continued water sampling in these same areas throughout the mine life and into closure and post-closure. Sabina emphasized that there would be approximately 25 years of analysis on all these waterbodies.[228]

The Board appreciates the additional detail in a revised AEMP provided by Sabina in the FEIS Addendum, acknowledges that additional improvements to the AEMP have been recommended by Parties, and expects that the improvements would be incorporated into further revisions of the plan through the permitting process. The Board considers the proposed water quality sampling and monitoring scheme as discussed through the supplemental Final Hearing sufficient for this stage of the assessment and provides confidence that any Project-related effects on water quality will be detectable.

4.7.4 Conclusions and Recommendations of the Board

The Board concluded in the 2016 Final Hearing Report that there was considerable uncertainty in relation to the effects predicted for ground and surface water quality due to the limited development of the Aquatics Effects Management Plan (AEMP) and the disagreement on the criteria for setting and assessing water quality objectives for arsenic. Following a review of the additional information provided by Sabina in the revised AEMP presented in the FEIS Addendum, and noting agreement during the supplemental Final Hearing among the Proponent and parties with regards to the SSWQO for arsenic, the Board believes that the Project's potential effects related to groundwater and surface water quality could be appropriately managed through the commitments provided by the Proponent and application of the following key mitigation measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Maintain an Aquatic Effects Monitoring Plan (AEMP) designed to determine the short and long-term effects in the aquatic environment resulting from the Project and assess the effectiveness of mitigation and management measures on Project effects in compliance with Metal Mining Effluent Regulations requirements, should an Environmental Effects Monitoring program be triggered. The AEMP should include sufficient sampling and monitoring programs to appropriately characterize the receiving environment and ensure adequate data is available to assess impact predictions made within the Final Environmental Impact Statement (FEIS) and the

[226] A. Maghagak, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 884-885, lines 9-26 and 1-10.
[227] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 885-887, lines 12-26, 1-26 and 1-20.
[228] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 887-889, lines 26, 1-26 and 1-4.

FEIS Addendum; and

- Implement water conservation and recycling at site to maximize water reuse and minimize the use of natural waters.

4.8 SEDIMENT QUALITY

4.8.1 Views of the Proponent

Sabina provided its assessment of potential project-induced effects on freshwater sediment quality in Volume 6, Section 5 of the FEIS. Information pertaining to Sabina's baseline sediment quality studies conducted from 2010 to 2013 was provided in Appendices V6-3A to V6-3C, as well as Appendix V6-4B: Back River Project – 2013 Freshwater Baseline Report. Additional information included in Sabina's impact analysis was provided in Appendix V2-7H: Back River Project – Water and Load Balance Report and in Appendix V6-4A: Back River Report – Goose Lake Hydrodynamic Modelling Report: Arsenic Predictions. Resulting from its assessment of project interaction groups with freshwater sediment quality, Sabina identified four (4) potential sediment quality residual effects from construction and demolition activities, site contact water, mine contact water, and explosives residues. Sabina predicted the potential residual effects, contingent on the application of mitigation measures identified within Volume 10 of the FEIS, would be not significant. Sabina further predicted that the potential residual effects would not contribute to cumulative or transboundary effects due to their limited spatial extent (within the Goose Property Local Study Area (LSA)).

Sabina identified the following three (3) spatial boundaries for its assessment of potential project-induced impacts to freshwater sediment quality:

- *Goose Property Potential Development Area* (Goose Property PDA) — Includes the project footprint which encompasses areas of planned infrastructure at the Goose Property.
- *Goose Property Local Study Area* —Includes the Goose Property PDA in addition to the watershed boundaries of the Propeller and Big watersheds for a total assessment area of 365 square kilometres (km^2).
- *Freshwater Regional Study Area* (RSA) — Includes the Goose Property PDA and the LSA, in additional to areas identified for potential indirect or cumulative effects for a total assessment area of 6,815 km^2. Sabina highlighted the specific inclusion of the upper 80 kilometres (km) of the Ellice Watershed as well as smaller sections of both the Ellice and Back River watersheds into the RSA.

It was noted that the Marine Laydown Area (MLA) was not considered in Sabina's assessment of freshwater sediment quality as the MLA PDA would not be expected to interact with any streams included in its analysis. Sabina indicated that effects related to the MLA were captured in Volume 7, Marine Environment. The temporal boundaries identified in Sabina's assessment aligned with all project phases including construction, operation, reclamation, and post-closure monitoring (see Section 2.2.3: Project Phases).

Sabina highlighted that project activities and components identified for their potential impacts on freshwater sediment quality were grouped by related project activities, shared pathways to the freshwater environment, and shared key sediment quality indicators. Sabina identified construction and decommissioning activities, site contact water, mine contact water, quarries and borrow pits, explosives,

fuels, oils, and polycyclic aromatic hydrocarbons, treated sewage discharge; and dust deposition as the project interaction groups for its effects assessment. To describe linkages between each project interaction group with freshwater sediment quality, Sabina identified runoff, water withdrawal, discharge, and aerial deposition as potential project interaction pathways.

As parameters for its analysis, Sabina adopted indicators from the contaminants of potential concern identified in the Canadian Council of Ministers of the Environment (CCME) sediment quality guidelines. The following four (4) indicators were included as part of Sabina's analysis:

- Particle Size
- Nutrients and Organic Carbon
- Metals
- Hydrocarbons

Sabina noted that the proposed mitigation measures included in its assessment were designed to eliminate or minimize project impacts on the freshwater environment, including freshwater sediment quality. Mitigation measures contained in its evaluation included: optimized design measures; implementation of best management practices; application of monitoring and adaptive management plans; as well as measures to adhere to relevant territorial and federal regulations. Additional information pertaining to Sabina's freshwater sediment quality mitigation and monitoring plans, including its Aquatic Effects Monitoring Plan, was provided in Volume 10 of the FEIS.

Using the identified key indicators, relevant scientific literature, quantitative modelling, and professional judgement, Sabina predicted the occurrence of the following four (4) residual effects:

- Sediment quality changes from construction and decommissioning activities, which is described as the disturbance of the landscape due to construction and reclamation of project infrastructure;
- Sediment quality changes due to site contact water;
- Sediment quality changes due to mine contact water; and
- Sediment quality changes due to the use of explosives and explosives residues.

Sabina predicted, contingent on the application of mitigation measures, that the potential residual effects on the VEC freshwater sediment quality would be not significant. Sabina's significance determination was based on the predicted limited spatial extent (within the Goose Property LSA) of the residual effects, in addition to their expected reversible nature, sporadic and short to long term duration (confined to the life of the Project), and low to moderate magnitude ratings.

Sabina outlined that predicted low magnitude ratings were attributed to predicted residual effects that had indicators within CCME sediment quality guidelines or less than 90% of baseline values if indicators were naturally greater than the respective thresholds (e.g., arsenic). Moderate magnitude ratings were attributed to residual effects that had indicators greater than CCME sediment quality guidelines or greater than 90% of baseline values if indicators were naturally greater than the respective thresholds, but less than ten times the threshold. Through its baseline sediment quality studies, Sabina observed that stream sediments were mainly comprised of sand, with small portions of gravel- and silt-sized particles and smaller proportions of clay. Lake sediments were noted to be mainly comprised of silt or

sand. Sediment metal results indicated that metal concentrations were generally elevated in lake sediment compared to stream sediment and that this difference between lakes and streams could be related to smaller proportions of find sediments in the streams. Sabina further observed that arsenic and copper sediment concentrations were naturally above CCME sediment quality guidelines at several lakes and streams within the Goose Property LSA, with Chair Lake having mean concentrations 4.8 times greater than the CCME Probable Effects Level for arsenic.

Sabina predicted that all potential residual effects on freshwater sediment quality would be restricted to the LSA, and therefore would not contribute to cumulative or transboundary effects. Additionally, Sabina noted that it expected all predicted residual effects to be reversible and that sediment quality would return to baseline conditions due to the resiliency of the freshwater.

No specific information related to this section was provided as part of the Final Environmental Impact Statement Addendum.

4.8.2 Views and Concerns of Interested Parties

In its 2016 final written submission, the Kitikmeot Inuit Association (KIA) noted that the power analysis simulation data provided by Sabina would need to be re-evaluated to improve the statistical power for detecting changes in sediment arsenic and benthic invertebrates.[229] The KIA added that the information provided indicated a potential issue with the Proponent's aquatics monitoring program, in that monitoring may fail to detect important changes in sediment arsenic or benthic invertebrates in time to trigger adaptive management prior to significant biological impacts occurring. The KIA noted that by re-evaluating the power analysis simulation as requested, the findings of significance could be used as a trigger to do more detailed sampling and that further, the monitoring program for sediment arsenic or benthic invertebrates would be improved. In written response to the request, Sabina repeated the simulations and provided the results for parties to review.[230]

The KIA further noted within its 2016 final written submission that Sabina has proposed a methodology to assess effects to sediment quality that permits substantial alteration to the aquatic environment while still allowing for a low magnitude effect classification. The KIA added that this methodology places undue focus on parameters for which a Canadian Council of the Ministers of the Environment (CCME) sediment quality guideline has been derived while ignoring potentially applicable guidance from other jurisdictions. It was noted that if this were to occur, impacts to the aquatic environment associated with project activities may be underemphasized. The KIA requested that Sabina evaluate all sediment quality parameters in the freshwater and marine environments in comparison with the baseline values as part of the effects assessment. For parameters with no associated CCME water quality guideline, the KIA recommended that Sabina look to other applicable jurisdictions for guidance on the application of appropriate water quality criteria. In written response, Sabina noted that the primary interaction pathways between the Project and the freshwater and marine environments are predicted to be runoff and discharge from the mine site. Sabina clarified that the sediment quality assessment was based on the parameters identified in the screening of quantitative water quality predictions and that it considered the approach sufficient. Further, Sabina noted that the parameters that were identified in the water quality screening that did not have CCME sediment quality guidelines for the protection of aquatic life (i.e., aluminum, iron, silver, and chloride) were all predicted to have short-term increases in

[229] Kitikmeot Inuit Association, 2016 Final Written Submission, March 10, 2016.
[230] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.

water concentrations above guideline thresholds in the immediate stream receiving environments. Sabina noted that it anticipates that sufficient baseline and monitoring data would be available to identify effects to aquatic life if additional environmental quality guidelines are developed.

During its presentation at the 2016 Final Hearing, the KIA noted that it had decided to defer the resolution of the "sample size to achieve minimal acceptable power for arsenic" until the water licencing phase of the Project.

4.8.3 Views of the Board

As noted in Section 4.7.3: Groundwater and Surface Water Quality of this report, the Board acknowledged the measures proposed by the Proponent in the FEIS and through discussions at the 2016 Final Hearing, though no new information being provided within the FEIS Addendum, or significant discussions occurred at the supplemental Final Hearing. In 2016, the Board concluded that it was concerned with the potential for changes in sediment quality that may be directly or indirectly attributable to project facilities and activities. The Board recognized that this issue would require further consideration by the respective regulatory authorities should the project proceed to permitting, and expects due consideration will be provided for requiring monitoring of sediment quality to be undertaken throughout the life of the Project.

4.8.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to sediment quality could be appropriately managed. The Board has not recommended specific terms and conditions in relation to sediment quality because the Board is satisfied that the potential for project-induced effects has been adequately addressed by the mitigation, management and monitoring measures proposed in Aquatic Effects Monitoring Plan (see Section 4.7: Groundwater and Surface Water Quality) and that these issues would be addressed in more detail through the Nunavut Water Board's water licensing process.

4.9 FRESHWATER AQUATIC ENVIRONMENT

4.9.1 Views of the Proponent

Sabina included its assessment of potential project-induced impacts on the freshwater aquatic environment in Volume 6, Sections 6 and 7 of the FEIS. To address valued components of the freshwater aquatic environment identified in the NIRB's Environmental Impact Statement Guidelines and through public consultation, Sabina opted to stream its assessment into two (2) categories of VECs labelled Freshwater Fish/Aquatic Habitat (Section 6) and Freshwater Fish Community (Section 7). Sabina highlighted that its assessment of potential effects on fish/aquatic habitats included only potential direct effects of project infrastructure and activities on physical aspects of the aquatic environment that provide distinct habitats for fish species. Potential indirect effects were addressed as part of the freshwater quality and sediment quality assessments (see Section 4.8: Sediment Quality). The assessment of potential effects on the freshwater fish community focused on two (2) abundant species within the Goose Property Local Study Area (LSA): Lake Trout and Arctic Grayling. Supporting baseline information and hydrodynamic modelling results were provided in Appendices V6-6A to V6-6E and V6-3B, V6-3C, and V6-4A.

Sabina indicated, contingent on the application of proposed mitigation measures and the balancing of all fish bearing habitat losses, that no residual, transboundary, or cumulative effects would be expected on the valued ecosystemic components for freshwater fish/aquatic habitat and freshwater fish community. Sabina noted that all fisheries losses would be highly localized (within the PDA) and that Inuit fishing locations would not overlap with any project study boundaries.

Sabina identified the following three (3) spatial boundaries for its assessment of potential project-induced impacts the freshwater aquatic environment:

- *Goose Property Potential Development Area* (Goose Property PDA) — Includes the project footprint which encompasses areas of planned infrastructure at the Goose Property.
- *Goose Property Local Study Area* — Includes the Goose Property PDA in addition to the watershed boundaries of the Propeller and Big watersheds for a total assessment area of 365 square kilometres (km^2).
- *Freshwater Regional Study Area* (RSA) — Includes the Goose Property PDA, the LSA, in additional to areas identified for potential indirect or cumulative effects for a total assessment area of 6,815 km^2. Sabina highlighted the specific inclusion of the upper 80 kilometres (km) of the Ellice Watershed as well as smaller sections of both the Ellice and Back River watersheds into the RSA.

Sabina noted that the Marine Laydown Area (MLA) was not considered in its assessment of the freshwater aquatic environment as the MLA PDA would not be expected to interact with any streams included in its analysis. The temporal boundaries identified in Sabina's assessment aligned with all project phases including mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

Freshwater Fish/Aquatic Habitat

Sabina identified two (2) effects pathways to characterize potential impacts from the Project on freshwater/aquatic habitats:

- Serious harm through loss or reduction of fish habitat by permanent alteration or destruction; and
- Serious harm through changes to water and sediment quality resulting in direct fish mortality or reduction in health and/or indirect reduction of the biological resources of fish through trophic interactions.

Project activities/components highlighted for their potential direct impact to freshwater/aquatic habitats through these pathways included: dewatering of lakes, ponds, and streams; development of open pits; water withdrawal for domestic and process use; water management activities; the Tailings Storage Facility; water intake and discharge pipe construction; airstrip and road crossings; and winter ice road construction.

Using baseline data collected between 2010 and 2015, Sabina estimated the extent of fish habitats within the PDA, LSA, and RSA by multiplying the proportion of fish bearing habitats to non-fish bearing habitats (calculated as 98%) by values for total wetted habitats in the PDA, LSA, and RSA. The resulting values were used to predict potential impacts to fish bearing habitats within the three (3) spatial boundaries. Sabina estimated the direct loss of fish bearing habitat would be 83 hectares (ha) due to the placement of proposed pits, water management structures (e.g., Saline Storage Pond), waste rock storage areas, a tailings storage facility, water intake and discharge pipes, and road crossings. The

above project activities and components were predicted to impact the Llama Watershed (Llama Lake, Umwelt Lake, associated streams and three (3) ponds), the Goose Watershed (Goose Inflow East and seven (7) associated ponds), the Wolf Watershed (538 metres (m) of Rascal Stream East, Goose Inflow East, eight (8) ponds, and a culvert at Gander Pond Outflow), and the Goose and Big lakes. These potentially impacted areas would constitute 11.5% of the fish-bearing habitat within the PDA, 1.2% of the Goose Property LSA, and 0.09% of the freshwater habitat within the RSA. Sabina further noted that proposed water withdrawal from Goose and Big lakes could also result in impacts from decreased amount and suitability of overwintering habitat available for fish, or by potentially exposing overwintering eggs to air.

In its assessment, Sabina noted that the primary mitigation measure to limit potential effects on freshwater/aquatic habitat was to locate proposed infrastructure in areas to avoid freshwater fish habitats whenever feasible. Sabina highlighted that the proposed locations of the camp/plant site, stockpile, and waste rock storage areas were all selected to avoid fish-bearing waters. Other key mitigation measures considered in its analysis included the establishment of maximum water volume uses from lakes during critical life stages of fish; adoption of regulatory best management practices for fish habitat impact avoidance, winter ice road construction, and the preservation of water and air quality; adaptive management protocols; and the adoption of an aquatic effects and fish offsetting monitoring programs, as well as a fish offsetting plan. Sabina indicated that its proposed fish offsetting plan would address all potential serious impacts to fish species with commercial, recreational, or Aboriginal value by creating compensatory fish habitats elsewhere in the landscape. Additional information on Sabina's conceptual fish offsetting plan, monitoring plans, and mitigation measures was provided in Volume 10 of the FEIS.

Sabina stated, contingent on the application of mitigation measures and the adoption of a fish offsetting plan, that no residual effects were expected to freshwater fish/aquatic habitat due to project infrastructure. Sabina stated that unavoidable habitat losses due to proposed project infrastructure would be restricted to the LSA, specifically in the Llama, Goose, and Wolf watersheds, and that all related habitat losses would be offset. Sabina further noted that no potentially affected species are identified in the *Species at Risk Act* or by the Committee on the Status of Endangered Wildlife in Canada. Furthermore, total predicted habitat losses were considered minimal when compared to total habitat available for these species within the LSA and RSA. Additionally, Sabina noted that no cumulative or transboundary effects would be expected to occur due to the absence of residual effects.

<u>Freshwater Fish Community</u>

Sabina identified two (2) effects pathways to characterize potential impacts from the proposed project on the freshwater fish community (Lake Trout and Arctic Grayling):

- Serious harm through direct mortality and changes to population abundance; and
- Serious harm through impacts to water and sediment quality resulting in reductions in health and/or indirect mortality.

Sabina highlighted the following proposed project components and activities with the potential to impact the freshwater fish community through direct mortality and population abundance changes: lake dewatering, building of winter ice roads, construction of infrastructure in the project footprint, water withdrawal for domestic and process use, winter ice road construction, and blasting with explosives. Sabina indicated that direct mortality of Lake Trout and Arctic Grayling (during fish-out plan) would be expected to result from the dewatering of the Llama and Umwelt lakes. Furthermore, reduced

population abundance of Arctic Grayling was noted to be anticipated in Goose Lake as spawning and rearing habitat loss was expected in the lake's southern tributaries. Although several ponds and water systems would be lost as a result of the construction of project infrastructure, Sabina noted that direct mortality of Lake Trout and Arctic Grayling would only be expected for many components if in-water work was completed outside of appropriate timing windows. Additionally, Sabina noted that improper placement, maintenance, and design of infrastructure (e.g., winter ice roads, culverts, and stream crossings) also demonstrated the potential to disrupt seasonal migratory patterns for fish species. Based on relevant scientific literature, Sabina also noted that use of explosives near Lake Trout or Arctic Grayling habitat may cause mortality of incubating eggs, internal organ damage, and behavioural changes. Potential related effects would likely be apparent in habitats near the Llama, Umwelt, and Main pits.

Sabina identified arsenic as a potential contaminant of concern for the freshwater fish community and as a result conducted hydrodynamic modelling to predict arsenic concentrations in Goose Lake at two (2) key Lake Trout spawning and overwintering sites. Based on results from the model, Sabina predicted that all arsenic concentrations would be substantially less than the toxicological thresholds for primary producers, aquatic invertebrates, and fish. Sabina further indicated that it did not anticipate adverse effects on fish communities in Goose Lake as a result of predicted changes to water quality. See Section 6.1: Human Health and Environmental Risk Assessment for additional information on Sabina's assessment of potential bioaccumulation in Lake Trout and Arctic Grayling.

In its assessment, Sabina noted that the primary mitigation measure to limit potential effects on Lake Trout and Arctic Grayling was to locate project infrastructure in areas to avoid fish habitat wherever feasible. Sabina's overall mitigation, monitoring, and adaptive management protocols and measures for the freshwater fish community were consistent with those highlighted above for freshwater fish/aquatic habitat. Within its proposed best management practices, Sabina noted that in-water work would be conducted during approved timing windows as per federal guidelines. Sabina further indicated that unavoidable losses to Lake Trout and Arctic Grayling would be compensated through the implementation of a fish offsetting plan.

Sabina stated, contingent on the application of mitigation measures and the balancing of all fish bearing habitat losses, that no residual effects would be expected on Lake Trout and Arctic Grayling. Sabina noted that potentially affected fish populations reside primarily in the upstream reaches of watersheds resulting in highly localized fisheries losses, located within the PDA, and that Inuit fishing locations do not overlap with the PDA, LSA, or RSA. In addition, Sabina noted that no cumulative or transboundary effects would be expected to occur due to the absence of predicted residual effects.

In Volume 6.7 of the FEIS Addendum, Sabina provided additional information in response to the Board's concerns, as expressed in the 2016 Final Hearing Report, related to the dewatering and fish-out plans and the limited use of Inuit Qaujimaningit when devising these plans. The Board also had concerns due to the limited data presented in the FEIS on the lakes that could be disrupted due to construction of the proposed winter ice roads, and was uncertain that the proposed fish offsetting plan (the Bernard Harbour / Nulahugyuk Creek project) would adequately mitigate all serious harm to fish.

The new or revised information in the FEIS Addendum included the following:

- Rascal Stream Fish way Memo (Appendix V6-6F);
- Winter Ice Road Water Withdrawal Memorandum (Appendix V6-6G);

- Bernard Harbour Report and Baseline (Appendix V6-6H);
- Conceptual Fish-out Plan (Volume 10, Chapter 31);
- Conceptual Fish Offsetting Plan (Volume 10, Chapter 21).

Sabina noted that the additional information provided in the FEIS Addendum did not change the conclusions presented in the Freshwater Fish / Aquatic Habitat section of the FEIS (FEIS Volume 6, Chapter 6).

In the Winter Ice Road Water Withdrawal Memorandum (FEIS Addendum Appendix V6-6G), Sabina detailed its proposed strategy to identify, select, and characterize waterbodies used for de-watering along the proposed ice roads. Sabina noted that providing additional information for all the waterbodies from which water would be withdrawn to support construction of the winter ice roads is in line with two (2) terms and conditions recommended by Fisheries and Oceans Canada (DFO) during the 2016 Final Hearing and agreed to by Sabina. Within the memo, Sabina described its proposal to use high spatial resolution stereoscopic satellite imagery to create bathymetric maps, noting the advantage of available coastal blue, blue, and green wavelengths. The memo further noted that depth, volume, fish overwintering capacity, and spawning shoal habitat would then be assessed for each waterbody, and that the information would be used to avoid, mitigate, or offset any potential harm to incubating eggs and spawning habitat. Within Volume 6.7 of the FEIS Addendum, Sabina confirmed its commitment to a term and condition agreed upon with DFO during the 2016 Final Hearing to follow DFO Best Management Practices to avoid and mitigate harm to fish from the construction, operation, and decommissioning of the proposed winter ice roads and from under ice water withdrawals. Sabina listed a variety of DFO guidelines in Nunavut and the Northwest Territories to which the mitigation actions as proposed in the FEIS would adhere.

The new information Sabina provided in the FEIS Addendum also included a *Draft* Conceptual Fish-out Plan (Volume 10, Chapter 31). This plan outlined proposed methods of fish removal, data to be collected, opportunities for community involvement and input on how fish would be used, as well as how Inuit Qaujimaningit principles and results of previous community consultation and engagement had been incorporated with respect to the proposed fish-out. Sabina noted that, as per a term and condition agreed upon with DFO at the 2016 Final Hearing, the fish-out plan would continue to be developed through collaboration with DFO and the impacted communities at the regulatory stage.

During the 2016 Final Hearing, DFO raised concerns that Arctic Grayling may not be able to access high quality spawning and rearing habitat within the upper reaches of Rascal Stream East following construction of project infrastructure, which could result in habitat losses in the lower reaches of the stream. During the 2016 Final Hearing, DFO and Sabina agreed on term and condition that Sabina would work with DFO in the design, construction, and operation of a proposed fishway to ensure fish passage. In the FEIS Addendum, Sabina provided information on the design, construction, operation, and monitoring program of fish passage mitigation via Rascal Stream West (Appendix V6-6F).

Lastly, the FEIS Addendum also included a revised Conceptual Fish Offsetting Plan (Volume 10, Chapter 21). Sabina noted that, as per several terms and conditions recommended during the 2016 Final Hearing, Sabina would work with DFO and the Kitikmeot Inuit Association (KIA) to further develop the offsetting plan, which would be finalized during the permitting phase of the Project and submitted as part of the Application for Authorization under the *Fisheries Act*. The FEIS Addendum also included results of baseline studies conducted at Bernard Harbour since the 2016 Final Hearing (Appendix V6-6H),

intended to further advance the plan. Sabina noted in Volume 6.7 of the FEIS Addendum that the 2016 baseline studies at Bernard Harbour focused on measuring Arctic Char migration and movement in Nulahugyuk Creek, and on characterizing the stream habitat and low-flow channels in the context of improving fish passage. Sabina added that the 2016 baseline studies also included opportunities for students and other community members in education and stewardship.

4.9.2 Views and Concerns of Interested Parties

In its 2016 final written submission, the Kitikmeot Inuit Association (KIA) noted that only two fisheries monitoring sites are being proposed by the Proponent in the project study area: one in Goose Lake and one in Propeller Lake.[231] The KIA noted concern with these two centrally located monitoring sites as they would be unsuitable for adequately assessing potential effects to slimy sculpin. The KIA noted that slimy sculpin reside in small home ranges and thus could benefit from smaller discrete sampling sites. The KIA recommended that additional slimy sculpin monitoring sites be included within the Aquatic Effects Management Plan (AEMP), and that site locations are situated where water quality/sediment quality/benthic invertebrate sites have been proposed. The KIA further recommended that each site should also have a sufficient number of replicates to determine potential project effects, and fish tissues should be analyzed for metal concentrations. In response, Sabina agreed with the KIA's assessment and indicated that it would add one (1) additional monitoring site as part of the AEMP. During its presentation at the 2016 Final Hearing, the KIA noted that the location of the proposed additional monitoring site "*… should be in close proximity to stations used for sampling for the purpose of testing water quality*."[232]

Within its 2016 final written submission the KIA noted Sabina's conclusions that no residual effects on freshwater fish and fish habitat would occur due to the application of an offsetting plan, and that thus, residual, cumulative, and transboundary effects analysis were not considered within the FEIS. The KIA recommended that the Proponent re-analyze the residual effects assessment without considering offsetting as a mitigation strategy, including an assessment of significance. The KIA recommended that if appropriate; the cumulative and transboundary effects assessment sections should also be revised. In response to the KIA's 2016 final written submission, Sabina indicated that the methodology used for evaluating potential residual effects on fish and fish habitat was consistent between the *Draft* Environmental Impact Statement (DEIS) and the FEIS and that re-analyzing the residual effects assessment without considering offsetting would be a significant departure from the assessment methodology that was found acceptable in the review of the DEIS.[233] Sabina clarified that the assessment, based on the methodology, concluded that there would be no project-related residual effects anticipated on fish and fish habitat. During its presentation at the 2016 Final Hearing, the KIA noted concern with Sabina's level of understanding of serious harm and residual effects on fish and fish habitat and that it would be satisfied with a commitment from Sabina to work with the KIA during the permitting phase on this issue. The KIA outlined that this would include reviewing the Fish Offsetting Plan as required under the *Fisheries Act* and the updates related to the assessment of impacts and offsetting for the Goose Lake Arctic grayling population.[234] Within Sabina's joint submission with the KIA

[231]Kitikmeot Inuit Association, 2016 Final Written Submission, March 10, 2016.
[232] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 633-634, lines 26 and 1-5.
[233] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[234] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 638, lines 6-16.

(Exhibit 93) submitted during the 2016 Final Hearing, Sabina committed to work with the KIA during the permitting phase to review the Fish Offsetting Plan as required under the *Fisheries Act*.[235,236]

The KIA further noted within its 2016 final written submission that several fish-bearing, or potentially fish-bearing waterbodies, which would be lost due to project activities were not considered as potentially causing residual serious harm to fish. As these waterbodies were subsequently omitted from fisheries productivity loss accounting, the KIA noted these waterbodies would not be part of any compensation plans either. The KIA requested that the Proponent outline the process for omitting each individual waterbody and recommended that all fish-bearing or potentially fish-bearing waterbodies be considered as potential fisheries productivity losses. To ensure the process is transparent and understandable to the reader, the KIA requested several documents for the exclusion of these waterbodies. In response to the KIA's request, Sabina provided two (2) updated tables with information on fish-bearing versus non-fish bearing waterbodies in the Goose Potential Development Area.

The KIA indicated within its 2016 final written submission that it was unclear if the 2014 monitoring results would provide sufficient baseline characterization of the Nulahugyuk Arctic Char population as the monitoring period may not reflect the entire migration period based on comparison with other nearby Arctic Char populations. The KIA noted that it identified several potential uncertainties surrounding the feasibility and successful implementation of the proposed offsetting program and recommended that any future baseline data collection should aim to address program uncertainties such as migration timing and inter-year variability. The KIA also recommended that the Proponent develop a robust adaptive management and monitoring plan in the event that the program requires ongoing mitigation or contingencies. In written response to the recommendations, Sabina noted that it addressed the uncertainties within the Conceptual Fish Offsetting Plan and is confident that the baseline characterization within the plan is reliable to inform future monitoring methods and successful implementation of the Bernard Harbour offsetting option. During its presentation at the 2016 Final Hearing, the KIA noted that Sabina committed to implementing robust monitoring methods to address unforeseen changes in fisheries.

The KIA further noted in its 2016 final written submission that the biomass projection calculations, assumptions, and rationales were not sufficiently understandable and transparent in the FEIS; that the biomass projections may not be realistic as the calculations did not include any potential limitations to Arctic Char population growth; and that the equation used to predict biomass losses in the project area was a broad-scale equation that may not have accurately reflected biomass in the project area. In response to the requests, Sabina provided the biomass equations, calculations, and projections and included additional discussions to support the requests. During its presentation at the 2016 Final Hearing, the KIA noted its concern that the fish biomass model used to determine fish gains in the proposed offsetting plan was not ecologically realistic and population projections as predicted in the model were not fully understood. The KIA noted that it would be satisfied with a commitment from Sabina to actively involve the KIA in adaptive management of the Fish Offsetting Plan. The KIA also noted concern with Sabina's level of understanding of Arctic Char productivity, fish biomass projections, and the Bernard Harbour system carrying capacity. The KIA again noted it would be satisfied with a commitment from Sabina to actively involve the KIA in evaluating early outcomes from monitoring and

[235] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1077-1078, lines 24-26 and 1-2.

[236] Sabina Gold & Silver Corp. and Kitikmeot Inuit Association, Joint Submission, Exhibit 93, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.

in updating the fish offsetting plans.[237] Within Sabina's joint submission with the KIA (Exhibit 93) submitted during the 2016 Final Hearing, Sabina committed to actively involve the KIA to assess the fish offsetting plan with the goal of determining if fish gains and population estimates are accurate in improving the plan where necessary. Further, within Exhibit 93, Sabina committed to actively involve the KIA in evaluating what progress or success is made early on in the implementation of the offsetting plan. The fish offsetting plan would be updated based on this evaluation to make sure goals are being reached.[238] The KIA also noted that it supports the fish offsetting plan for Bernard Harbour.[239]

Within its 2016 final written submission Environment and Climate Change Canada (ECCC) outlined concerns with the proposed discharge of treated camp effluent to the tundra, noting that the discharge of poor quality surface runoff to adjacent waterbodies would be highly deleterious to aquatic organisms, as well as to soil bacteria and invertebrates.[240] ECCC recommended that the discharges of treated wastewater should be of acceptable quality such that the surface runoff would not present impacts to adjacent waterbodies or toxicity to soil-dwelling organisms. In response to ECCC's 2016 final written submission, Sabina provided a summary of typical treated discharge concentrations for nitrogen species, noting that the predicted concentration of nitrite would not be expected to present toxicity to soil-dwelling organisms.[241] Sabina further noted that the results provided are the current state of practice.

Fisheries and Oceans Canada (DFO) raised numerous concerns in its 2016 final written submission regarding the Project's potential to impact the freshwater aquatic environment.[242] DFO indicated that the proposed project includes flow reductions in Rascal Stream East, Goose Inflow South, and Goose Inflow East that have the potential to cause *serious harm to fish* as defined by the *Fisheries Act.* DFO noted concern that fish passage may be impeded or *serious harm to fish* may occur from the Project if appropriate avoidance and mitigation practices are not employed in water crossing design, construction, and maintenance. DFO recommended that the Proponent implement all available best management practices to mitigate *serious harm to fish* as a result of water crossing construction, operation, and decommissioning activities. DFO further recommended that the proposed monitoring program include measures to ensure that barriers to fish passage do not form over time. In response to the written submission, Sabina acknowledged the measures as noted by DFO and indicated that it would implement all available best management practices to avoid and mitigate serious harm to fish. Sabina further noted that the monitoring program as proposed for fish bearing culverts would also include measures to ensure that barriers to fish passage do not form over time and that it would provide DFO with detailed site-specific plans of all fish-bearing water crossings prior to construction.

DFO further stated within its 2016 final written submission that water withdrawal from ice covered waterbodies for the development of the winter ice roads has the potential to have a negative impact on fish and fish habitat and provided recommendations to the Proponent, including requesting bathymetry, location and fish habitat features within the selected waterbodies used for winter water withdrawal. In written response to DFO's request Sabina agreed to provide the requested information and noted again

[237] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 638-639, lines 26 and 1-6.
[238] Sabina Gold & Silver Corp. and Kitikmeot Inuit Association, Joint Submission, Exhibit 93, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[239] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1078, lines 3-22.
[240] Environment and Climate Change Canada, 2016 Final Written Submission, March 9, 2016.
[241] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[242] Fisheries and Oceans Canada, 2016 Final Written Submission, March 7, 2016.

that it would implement all best management practices to avoid and mitigate *serious harm to fish*. During its presentation at the 2016 Final Hearing, DFO noted that this technical issue had been resolved to the satisfaction of the Department based on the responses provide by the Proponent.[243]

During the 2016 Final Hearing, Board staff requested clarification on the type of information that was collected to confirm that lakes selected for seasonal water withdrawal to support the proposed winter ice roads would be capable of providing the required amounts of water without adversely affecting the natural hydrology or aquatic wildlife habitat, and whether the routing of the winter ice road would stay the same if it was found that alternate withdrawal sources were required.[244] In response, Sabina noted that bathymetry studies of the large lakes across the proposed winter ice road corridor were completed but as per DFO's 2016 final written submission, additional information would be required and would be provided. Further, Sabina noted that it is confident that there is sufficient water to build the winter ice road as proposed, even if it would need to withdraw water from other lakes.[245]

Board staff also requested clarification from Sabina on how experience gained from other winter ice roads operating in northern Canada informed its assessment, particularly with regards to potential impacts from traffic noise on fish and aquatic wildlife. Board staff also requested clarification on why potential noise impacts on fish from the proposed winter ice road was not considered important and whether Sabina is "*… aware that the operational practices of the winter roads used in Northwest Territories were designed such as to limit or prevent impacts to fish and aquatic species?"*[246] Sabina noted that the focus of its review was on the Tibbitt-Contwoyto winter ice road and the methodology used to limit wildlife movement. Sabina clarified that the assessment of potential noise impacts focussed on terrestrial mammals as it was not considered that noise from the winter ice road would impact fish. Sabina noted that the period of time when fish would be exposed to noise from the winter ice road would be during the spring migration; however, this would occur during spring ice break-up and would be unsafe for vehicles to travel on the winter ice road. Thus, Sabina concluded that, the potential impacts from winter ice road traffic on fish would be minimal.[247]

Within its 2016 final written submission, DFO further noted uncertainty as to whether Goose Lake Arctic Grayling would be able to access Upper Rascal Stream East and Rascal Stream West habitat for spawning, as access would require migration through Gander outflow, to Gander Pond and then upstream through the reaches of the Rascal Stream West. DFO indicated that a quantitative assessment of Arctic Grayling migration through Rascal Stream East had not been completed by Sabina. DFO also noted uncertainty as to whether Sabina assessed the suitability of all the undisturbed streams, ponds, and lakes connected to Goose Lake to determine their suitability as spawning, rearing, and nursery habitat for the Arctic Grayling population. DFO noted concern that the Goose Lake Arctic Grayling population may be lost due to lack of confirmed spawning habitats available in other undisturbed streams, ponds, and lakes. As a result of these concerns, DFO recommended that the Proponent re-

[243] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 477-478, lines 2-26 and 1-8.
[244] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 150 and 152, lines 6-19, 5-13.
[245] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 150-152, lines 22-26, 1-26, 1, and 16-24.
[246] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 153, 154, lines 2-10 and 15-22.
[247] K. Marchinko, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 155, lines 5-22.

asses the availability of spawning and rearing habitat for the Goose Lake Arctic Grayling population, including an assessment of the suitability of the other undisturbed Goose Lake tributaries. Based on the outcome of the re-assessment, DFO recommended the Proponent re-assess the potential impacts of the loss of Arctic Grayling spawning and rearing habitat on the Goose Lake population based on the outcome of re-assessment of availability of spawning and rearing habitat. In response to DFO's 2016 final written submission, Sabina noted that based on the baseline studies completed from 2013 through 2015, there appears to be a total of 6,467 metres (m) of fair to good quality spawning habitat available to Arctic Grayling for overwintering in Goose Lake. Sabina added that the majority of spawning and rearing habitat is found in Rascal Stream East, Goose Inflow East, and Goose Inflow South, while smaller amounts are available in Rascal Stream West and in the Goose to Propeller Lake Outflow and tributaries. Sabina noted that after further review of its baseline studies, the assessment of Arctic Grayling, and the Conceptual Fish Offsetting Plan, it appeared questionable that Arctic Grayling from Goose Lake would consistently be able to migrate between the Gosling Ponds 1 and 2 and Rascal Stream East to access spawning habitat in the upper reaches of Rascal Stream East. Sabina outlined that baseline studies showed that although Arctic Grayling adults and fry use Rascal Stream West (including Gander Pond and Gosling Ponds 1 and 2), low flows in late summer may, under certain conditions, restrict movement of fish within this area and to habitat in Rascal Stream East. Noting DFO's preference to mitigate rather than offset, Sabina committed to ensuring adequate fish passage between Gosling Ponds 1 & 2 and spawning habitat in upper Rascal Stream East. Sabina noted that although options will be further assessed with DFO and other interested parties during the regulatory phase, the conceptual installation of a migratory fishway, connecting the natural spawning habitat in upper Rascal Stream East to Gosling Pond 1, is currently preferred based on known information.

During the 2016 Final Hearing, the KIA requested that Sabina comment on the potential effects stream habitat loss would have on the Arctic Grayling population with offsetting as the primary mitigation measure, specifically to the serious harm that could be incurred to the Arctic Grayling population in Goose Lake.[248] Sabina re-iterated in response that the methodology used was found acceptable in the DEIS and then brought forward in the process for the FEIS. Sabina indicated that the absence of predicted significant residual effects does not necessarily mean that serious harm to fish would not occur, and referred to the loss of Llama Lake, Umwelt Lake, and spawning habitat in Goose Lake. Sabina noted that all potential impacts on fish were included in the Fish Offsetting Plan and that impacts would be fully offset through the plan which would be covered during the application for a *Fisheries Act* authorization.[249]

During the 2016 Final Hearing, DFO also requested clarification on the written response to 2016 final written submissions by Sabina that describes the use of a diversion channel to connect Rascal Stream East to allow Arctic Grayling to access the upper reaches of Rascal Stream East to allow Arctic Grayling, and how this would be accomplished when baseline data indicated that, under certain conditions, movement of fish would be restricted within this area due to a small cascade/waterfall within the stream.[250] In response, Sabina indicated that while no studies had been completed to look at the ability of Arctic Grayling to pass over the cascade, it was noted during baselines studies that it could potentially

[248] N. Lower, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 139 and 140 lines 12-22 and 2-4

[249] K. Marchinko, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 140-141, lines 5-26 and 1-2.

[250] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 144-145, lines 20-26 and 1-18.

be a barrier during low flow but would need to be verified. Sabina noted that the barrier would potentially only be a few inches and would be within the range of what adult Arctic Grayling would be able to surmount, although juveniles would have difficulty navigating the obstruction.[251] During its presentation at the 2016 Final Hearing, DFO reiterated its concerns with respect to Arctic Grayling population having access to the high quality spawning and rearing habitat but noted that Sabina agreed with DFO's assessment committed to: ensuring adequate fish passage between Gosling's pond 1 and 2 and the spawning habitat in the upper Rascal Stream East; working with regulatory bodies on developing a design of a stream diversion; and updating the habitat offsetting calculations to reflect the loss of a portion of upper Rascal Stream West resulting from the stream diversion.[252] Sabina committed to a suggested term and condition to further engage parties during the regulatory phase in the design, construction, and operation of adequate fish passage to permit migration of Arctic Grayling from Goose Lake to natural spawning and rearing habitat located within upper Rascal Stream East, south of the planned airstrip (Exhibit 85, 2016 Final Hearing).[253]

DFO also indicated within its 2016 final written submission that blasting operations may have the potential to negatively impact fish and fish habitat if adequate blasting thresholds and set-back distances are not appropriately calculated and implemented. DFO recommended that Sabina revise its instantaneous pressure threshold limit to 50 kilo Pascal (kPa), recalculate appropriate setback distances, develop adequate mitigation measures to address the effects of blasting on fish to reduce the risk of *serious harm to fish,* and develop an appropriate blast monitoring and mitigation plan to ensure that peak particle velocities do not affect spawning habitats in Goose lake. In response to the written submission, Sabina noted that it would adhere to DFO's guidelines of 100 kPa pressure threshold limit and would develop blast monitoring and mitigation measures to ensure that particle velocities do not exceed 13 mm/s at important spawning habitat in Goose Lake.

During the 2016 Final Hearing and during its presentation, DFO reiterated its recommendation that Sabina consider using 50 kPa as the instantaneous pressure threshold limit as research in the north has shown it to be more protective of fish during blasting activities. DFO also requested clarification on the threshold Sabina was considering.[254] Following offline discussions with Sabina, DFO noted that its concerns with respect to threshold limits would be addressed if Sabina were to employ an approach similar to that used by Baffinland Iron Mine Corp. for the Mary River Iron Mine Project. DFO referenced term and condition 48 from the Mary River Iron Mine Project Certificate and noted that it speaks to exploring possible project-specific thresholds that would exceed the requirements of DFO's guidelines for use of explosives in or near Canadian waters.[255] During the 2016 Final Hearing, Sabina worked with DFO and developed wording for a recommended term and condition where Sabina has committed to engage with DFO in exploring possible project specific thresholds, and mitigation and monitoring

[251] K. Marchinko, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 145-145, lines 21-26 and 1-15.
[252] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 473-477.
[253] Federal Departments Submission, Exhibit 85, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[254] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 142-143, lines 12-26 and 1-16.
[255] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 471-472, lines 14-26 and 1-4.

measures for blasting that would exceed the requirements of DFO's Guidelines for the Use of Explosives in or near Canadian fisheries waters (Exhibit 85).[256]

The Yellowknives Dene First Nation also requested clarification from Sabina during the 2016 Final Hearing on how Sabina would establish the threshold for negative impacts on fish without being able to measure effects directly to fish.[257] Sabina noted that established minimal thresholds for the vibration frequency were determined following literature reviews but that it would also conduct fish population monitoring programs to determine if any deformations or lesions are caused by blasting. However, Sabina expressed that thresholds would be established to avoid these types of effects.[258]

Finally within its written submission, DFO noted the importance of understanding the fish-out process that would be followed in Llama and Umwelt lakes to ensure that the amount of fish lost is accurately documented. DFO noted the development of an appropriate Offsetting Plan is required to address *serious harm to fish* as part of the *Fisheries Act* Authorization process for the Project. DFO also noted this concern during the 2016 Final Hearing and requested clarification on the proposed sequence of the dewatering and fish-out program for Llama Lake.[259] DFO further noted within its 2016 final written submission that there was a change in mine plan from the *Draft* Environmental Impact Statement (DEIS) with respect to Umwelt Lake and that the Proponent is now proposing to use the Umwelt Lake basin as a Saline Water Management Pond. DFO noted that this change created uncertainty regarding the application of Section 36 of the *Fisheries Act* and highlighted that it would work with the Proponent and ECCC to determine the applicability of the Metal Mining Effluent Regulations (MMER) with the use of Umwelt Lake as a Saline Water Management Pond. Once a determination has been made on the regulatory requirements, DFO recommended that Sabina continue to work with DFO and the impacted communities to develop a detailed fish-out and dewatering plan and to finalize the Conceptual Offsetting Plan.[260] During its presentation at the 2016 Final Hearing, DFO noted that the Proponent committed to working with ECCC and DFO to reconcile the regulatory requirements to use Umwelt Lake as a Salient Water Management Pond, and further committed to working with DFO and impacted communities to finalize the conceptual fish offsetting plan. Based on the responses provided by Sabina, DFO noted that this technical issue was resolved to the satisfaction of DFO.[261]

Following DFO's presentation at the 2016 Final Hearing, Sabina requested confirmation that the information provided in its baseline studies was sufficient for the impact assessment process, acknowledging that a significant amount of work would still be required for the regulatory review process.[262] DFO responded, noting the information provided to date was adequate for the impact assessment review.

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[256] Federal Departments Submission, Exhibit 85, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[257] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 147-149.
[258] K. Marchinko, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 147-148, lines 22-26, 1, and 8-20.
[259] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 141-142, lines 15-24.
[260] Fisheries and Oceans Canada, 2016 Final Written Submission, March 7, 2016.
[261] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 478-481.
[262] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 486, lines 17-26.

The Kugluktuk Hunters and Trappers Organization (Kugluktuk HTO) provided a summary during the 2016 Final Hearing on the fish offsetting project that it has with Sabina. The program included the potential Bernard Harbour Fish Restoration Project and studies, as well as Traditional Knowledge studies that had been conducted in partnership with Sabina and the Kugluktuk HTO.[263] The HTO noted concern with the time frame of the proposed the Bernard Harbour Fish Restoration Project and wanted confirmation from Sabina, the KIA, and DFO on whether the intention is to proceed with the Bernard Harbour Fish Restoration Project this year.[264]

Board staff also requested that DFO briefly describe the requirement for offsetting, how the offsetting requirements would be quantified from the details of the proposed works associated with the Back River Project, and then how it would apply to habitat rehabilitation near the community of Kugluktuk, Bernard Harbour, and the Nulahugyuk Creek Fish Rehabilitation Project. Further clarification was requested on how habitat would be compensated if the Proponent potentially removed more habitat than initially predicted.[265] DFO stated that the *Fisheries Productivity Investment Policy* used by DFO allows for flexibility in choosing an offsetting plan with the selection of offsetting measures focused on improving fisheries productivity. Based on the available areas that could be restored within Nunavut, the Bernard Harbour Fish Restoration Project was brought up the community of Kugluktuk as being a concern. With respect to the proposed Fish Offsetting Plan, DFO noted that the Proponent would have to compensate for habitat deficits if it determines the lost habitat is more than what was predicted.[266]

During the 2016 Final Hearing, a Community Representative from Kugaaruk requested clarification on the regulations (and regulatory bodies) responsible for allowing a mine (and a mine camp) near waterbodies. [267] Sabina responded by noting the any dewatering of lakes would require approval from DFO and would work closely with KIA.[268]

A Community Representative from Dettah, Northwest Territories noted concern regarding haul truck traffic along the proposed winter ice road and the potential impacts to the fish and the lakes. Further, the representative asked whether testing of the lake water at Back River would be conducted, noting experience with the winter ice road that goes to Contwoyto Lake that has been used by the mining industry since 1958 for hauling.[269] A Community Representative from Cambridge Bay requested clarification on how sea ice and lakes would be monitored once the haul trucks are hauling on the ice roads, especially for leakage of oil and spills from the trucks.[270] Sabina responded by noting that rules would be put in place that drivers would have to follow such as speed limits, stopping for wildlife, and

[263] L. Adjun, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 985-988.
[264] L. Adjun, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1081, lines 14-22.
[265] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 489-490, 493, lines 24-26, 1-8 and 2-12.
[266] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 491-495.
[267] M. Nartok, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 831-832, lines 21-26 and 1-3.
[268] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 832-833, lines 10-26 and 1-13.
[269] A. Crapaud-Baillargeon, Dettah, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 914, lines 7-20.
[270] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 933, lines 19-25.

waste disposal, and that staff would be monitoring the haul road truck drivers for compliance with these rules.[271] A Community Representative from Wekweètì requested clarification on how many lakes the winter ice road would cross and further noted concern with hauling fuel and the potential for it to seep into the water and having an impact on the environment, including fish and seals.[272]

A Community Representative from Omingmaktok (Bay Chimo) requested clarification on where the water and fish would be diverted to after the dewatering of Llama and Umwelt lakes.[273] Sabina responded by providing a summary of its dewatering and fish-out plans.

A Community Representative from Gjoa Haven noted concern with the potential impacts to the land, vegetation, and fish and fish habitat from hauling activities during the winter months.[274] Another Community Representative from Kugaaruk requested that studies be conducted on fish and small mammals to ensure that they are not impacted from chemically impacted soils near the mine site.[275]

A Community Representative from Kingaok (Bathurst Inlet) requested clarification from DFO, ECCC, and Transport Canada (TC) on the agency's abilities to inspect the Proponent's project activities to ensure the mitigation plans are being implemented.[276] DFO noted that the Proponent would have to follow the *Fisheries Act* authorization that would be issued to them and that DFO's goal would be to visit the site once a year.[277] ECCC noted that the Proponent would be required undertake an Environment Effects Monitoring program as required under the *Fisheries Act* and the Metal Mining Effluent Regulations.[278] TC indicated that once the *Navigation Protection Act* authorizations have been issued, TC would be doing follow-up and monitoring to ensure that the works are built as per the *Navigation Protection Act* approvals.

A Community Representative from Kugluktuk requested that Sabina describe the proposed fish-out and dewatering process that it would be conducting.[279] Sabina responded by describing the process and noting that plans have been established for both Umwelt and Llama lakes and that the fish-out program would be undertaken in two (2) stages.[280]

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[271] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 936, lines 8-26.
[272] J. Judas, Wekweètì, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 954-955, lines 22-26 and 1-15.
[273] N. Haniliak, Omingmaktok (Bay Chimo), NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 938, lines 18-20.
[274] S. Hiqiniq Sr., Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1053-1054, lines 26 and 1-5.
[275] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1277, lines 19-22.
[276] C. Kapolak, Bathurst Inlet, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1186, lines 5-9.
[277] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1186-1187, lines 14-26 and 1-14.
[278] L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1188, lines 18-24.
[279] C. Westwook, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1190, lines 1-4.
[280] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1190-1191, lines 5-26 and 1-7.

Within its final written submission on the FEIS Addendum, the Kitikmeot Inuit Association (KIA) made the following recommendations to address concerns with the new Rascal Stream Fishway Memo in the FEIS Addendum:

- Revise figures and corresponding text for clarity and consistency to ensure the full extent of potential fish habitat loss is clear;
- Provide a conceptual drawing of the proposed fishway, including basic channel and flow characteristics to ensure fishway would provide adequate compensation for predicted effects;
- Provide more comprehensive site-specific baseline information on Arctic grayling that includes additional Inuit Traditional Knowledge;
- Revise monitoring program to collect baseline information at Year 0 rather than Year 1;
- Clarify meaning of 'fishway', 're-aligned stream' and 'enhanced Rascal Stream West' and ensure consistent use;
- Provide additional details on the timing of the proposed fishway mitigation activities, and clarify whether the effects would be considered as losses to fisheries or fish habitat; and
- Indicate how mitigation success would be evaluated.

In its written response to the KIA, Sabina provided a revised figure of the proposed Rascal Stream Fishway (Figure 1.1-2 from the Rascal Stream Fishway Memo, FEIS Addendum Appendix V6-6F) referred to other fish habitat losses presented in Figure 6.5.1 in the FEIS (Volume 6, Chapter 6) and Figure 2.2-2 of the Rascal Stream Fishway Memo, and indicated that the figures would be updated during the regulatory phase to accurately detail potential habitat loss areas, as well as flow direction, and elevation of relevant ponds and lakes along with a table of stream width, length, and area of stream habitat losses. Sabina further referred to Table 6.5-5 from the FEIS (Volume 6, Chapter 6) which provides more information on fish habitat losses. During the supplemental Final Hearing, the KIA stated that it was satisfied with the additional information provided by Sabina regarding the proposed Rascal Stream Fishway and confident that the environmental impacts of this issue were understood, mitigable, or manageable, and would be further addressed through the *Fisheries Act* authorization should the project be allowed to proceed.[281]

The KIA also recommended in its final written submission on the FEIS Addendum that Sabina refer to the Rascal Stream Fishway as compensation or offsetting, rather than as "mitigation by design", as the latter would allow potential impacts of the construction of the fishway itself to be overlooked. In its response, Sabina reiterated that the fishway would result in greater habitat connectivity but acknowledged that habitat would be lost in lower sections of Rascal Stream East. Sabina indicated that these losses were accounted for in the Conceptual Fish Offsetting Plan and reiterated its commitment to working with both Fisheries and Oceans Canada (DFO) and the KIA regarding the proposed fishway during the regulatory phase, noting inclusion of the KIA as a minor modification to a previously proposed term and condition. During the supplemental Final Hearing, the KIA agreed with Sabina's reasoning that the fishway is better described as a mitigation measure and not considered part of the offsetting plan.[282]

[281] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 425-428, lines 4-26, 1-26, 1-26, and 1-3.
[282] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 425, lines 14-25.

Within its final written submission on the FEIS Addendum, DFO requested that Sabina provide them with a detailed Rascal Stream fish passage plan and an associated annual monitoring plan during the regulatory phase, prior to construction of the fishway. In its response, Sabina committed to providing DFO with a Rascal Stream fish passage plan during the regulatory phase and prior to its construction, which would include design, construction, operation, monitoring, closure/remediation, and design of habitat creation. Sabina also committed to submitting to DFO an annual monitoring plan regarding the Rascal Stream Fish Passage during the regulatory phase. In the FEIS Addendum, Sabina further noted its agreement with an associated term and condition or commitment jointly provided to the NIRB during the FEIS Final Hearing calling for Sabina to engage DFO and other interested parties during the regulatory phase on the design, construction, and operation of the fish passage, with Sabina noting that the KIA would also be engaged (modification of term and condition originally proposed). During the supplemental Final Hearing, DFO indicated that based on the response of the Proponent, it considered the issue resolved.[283]

Within its final written submission on the FEIS Addendum, the KIA commented on the Winter Ice Road Fish Habitat Memo (FEIS Addendum Appendix V6-6G), and noted that Sabina needed to clarify the season in which the satellite imagery would be obtained to generate bathymetric maps. Sabina responded that the satellite imagery would be collected between July and August. DFO also commented on the Winter Ice Road Memo in its final written submission on the FEIS Addendum, noting that it agreed with the proposed terms and conditions that Sabina would provide DFO with detailed bathymetry for lakes from which water would be withdrawn for the proposed winter ice road construction and would implement all applicable DFO best management practices. DFO recommended these terms and conditions be added to the revised Final Hearing Report should the Board recommend the project be allowed to proceed. DFO indicated during the supplemental Final Hearing that it considered the issue of water withdrawal for winter roads to be resolved.[284]

In its final written submission on the FEIS Addendum, DFO also commented on the proposed water crossings (up to five (5)) that would be required to maintain drainage patterns across the haul road and airstrip. DFO referenced two (2) terms and conditions that had been proposed during the 2016 Final Hearing which required Sabina to follow DFO's best management practices for water crossings (culverts), and develop detailed design drawings and a monitoring program to be produced prior to construction during the regulatory phase. In its written response, Sabina confirmed its commitment to adhere to these requirements.

DFO also provided comments within its final written submission on the FEIS Addendum regarding blasting. DFO recommended that, if the Project was allowed to proceed, a term and condition recommended during the 2016 Final Hearing be added to the revised Final Hearing Report requiring Sabina to work with DFO to explore possible project-specific thresholds, mitigation, and monitoring for blasting to meet or exceed the requirements of Fisheries and Oceans Canada's Guidelines for the Use of Explosives In or Near Canadian Fisheries Water. In its written response, Sabina confirmed its

[283] M. D'Aguiar, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 502, lines 18-21.
[284] M. D'Aguiar, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 500, lines 5-10.

commitment to this commitment. DFO concluded during the supplemental Final Hearing that it considered this issue to be resolved for the environmental assessment phase.[285]

In its final written submission on the FEIS Addendum, the KIA commented on Sabina's new Conceptual Fish Offsetting Plan (Volume 10, Chapter 21), and requested clarification on how lakes and ponds were classified as fish bearing or non-fish bearing if no fish were captured. The KIA also noted that the offsetting plan should consider losses to fisheries productivity for species such as Lake Trout, Arctic Grayling, and Round Whitefish. Additionally, the KIA's submission listed several commitments from the 2016 Final Hearing requiring Sabina work with the KIA while completing the detailed Fish Offsetting Plan during the permitting phase.

In response, Sabina clarified that any effects to shallow ponds without small-bodied fish and characterized by limited hydrologic connectivity to other waterbodies which support large-bodied fish would not result in residual serious harm to fish. Sabina indicated it would clarify the text in the next version of the Conceptual Fish Offsetting Plan during the regulatory phase. Sabina added that fisheries productivity was assessed in the Conceptual Offsetting Plan (FEIS Addendum Volume 10) and that it was confident that the assessment of gains and losses and proposed offsetting option meet the requirements and expectations of DFO, regardless of species. Sabina further confirmed it would work with the KIA and DFO to develop the detailed fish-out and offsetting plans during the permitting phase and would engage with the KIA in evaluating early outcomes from monitoring and updating fish offsetting plans. Subsequently, the KIA concluded during the supplemental Final Hearing that it was confident that further discussions during the regulatory stage, along with ongoing monitoring and evaluation of early outcomes, would lead to potential environmental impacts being mitigable or manageable.[286]

In its final written submission on the FEIS Addendum, DFO confirmed that it would work with Sabina and the affected communities during the regulatory phase to finalize the Conceptual Fish-Out Plan and the Conceptual Offsetting Plan (Bernard Harbour / Nulahugyuk Creek fish restoration project) as per the 2016 recommended term and conditions provided in its 2016 final written submissions on the FEIS. DFO noted that within Sabina's table of commitments included in the FEIS Addendum (Volume 6), Sabina did not mention its commitment to work with DFO and the impacted communities at the regulatory approval stage to develop a detailed dewatering plan. DFO recommended that the dewatering plan should be reviewed with DFO during the regulatory phase as per the 2016 term and condition. In its response, Sabina confirmed it would continue to work with DFO and the impacted communities at the regulatory stage to develop a detailed fish-out and offsetting plan. During the supplemental Final Hearing, DFO acknowledged that Sabina had engaged DFO regarding the Bernard Harbour Project and DFO recommends these discussions continue and include the KIA, and considered the issue resolved.[287]

Following DFO's technical presentation during the supplemental Final Hearing, the KIA asked the department to clarify how the KIA and hunters and trappers organizations would be involved through the *Fisheries Ac*t authorization process. DFO clarified that although Sabina and DFO would likely engage

[285] M. D'Aguiar, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 500, lines 11-23.
[286] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 428-429, lines 21-26 and 1-4.
[287] M. D'Aguiar, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 504-505, lines 6-26 and 1-5.

in discussions prior to submission of the *Fisheries Act* authorization, once an application for the authorization was received, DFO could involve any group interested in providing comments. DFO indicated that while the onus would be on Sabina to consult with the public[288], DFO could conduct its own consultations if need arose, suggesting it likely would.[289] Sabina subsequently responded that it would be happy to work with DFO to make sure that the consultation requirement is met within the communities.

In its final written submission on the FEIS Addendum, Environment and Climate Change Canada (ECCC) provided recommendations on the potential for diving-bird entanglement in gill nets to be used during the planned fish-out. Specifically, ECCC requested further details on the proposed mitigation measures (e.g., increasing visibility of gill nets or the use of bird deterrents) as well as further details on reporting, triggers, and adaptive management measures. In its written response to ECCC's submission, Sabina noted that it would use both noise (bear bangers and screamers when birds sighted) and visual (predatory bird decoys) stimuli to deter migratory water birds during the fish-out of lakes and that daily records of bird activity would be taken during the fish-out and used to adapt the management strategies accordingly. Sabina proposed a new corresponding term and condition and/or commitment, calling for Sabina to engage with ECCC during the development of the fish-out plan to ensure adequate and appropriate protection measures are in place for birds. ECCC indicated during the supplemental Final Hearing that it was satisfied with Sabina's response.[290] For additional discussion, see Section 4.12: Birds and Bird Habitat.

During the supplemental Final Hearing, the Burnside Hunters and Trappers Organization (BHTO) recommended that DFO have someone present, such as a representative from the KIA or HTO, to process the fish during the fish-out, noting that community members prefer eating freshwater fish over saltwater fish.[291] A Community Representative from Gjoa Haven also stressed that the fish taken out of the lakes during dewatering should be provided to community members, for example, widows and widowers that are unable to go out hunting and cannot provide for themselves.[292] In reply, Sabina noted that approximately 700 fish would be available through the dewatering of the two (2) lakes, and that it was committed to working with the communities to ensure the fish-out process is appropriate and that the fish are provided to communities for their use.[293] Sabina reiterated this response later during the supplemental Final Hearing in response to a question from a Community Representative of Kugaaruk regarding how the fish-out would be conducted.[294]

[288] M. D'Aguiar and V. D'amours Gauthier, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 507-508, lines 16-26, 14-21.
[289] V. D'amours Gauthier, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 511 lines 14-22.
[290] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 478, lines 14-25.
[291] C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 509, lines 21-25.
[292] M. Aglukkaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 689-690, lines 19-26 and 1-5.
[293] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 690-691, lines 16-26 and 1-2.
[294] O. Alakannuark, Kugaaruk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 980, lines 2-5.

A Community Representative from Wekweètì expressed concerns with Sabina's plans to dewater lakes, noting the importance of fish and the freshwater environment. The representative stated "*we've got to have great respect for what's in the water*…"[295] The representative questioned Sabina on how the road would be built over streams and rivers and whether culverts or bridges would be used. In response, Sabina emphasized that the two (2) lakes to be dewatered (Llama and Umwelt) are connected to each other but not connected to anything else, and as such fish would be unable to move from them to other waterbodies. Sabina noted that there are few fish in those lakes compared to other lakes that have been dewatered elsewhere, and the fish from them would be made available to communities. Sabina also reiterated the work on the Bernard Harbour restoration project would offset the loss of fish in Llama and Umwelt "many, many times over." [296] Lastly, Sabina emphasized that the proposed winter ice road would be a winter road only, composed of snow and ice, and no permanent infrastructure would be built. [297]

A Community Representative from Taloyoak and a Community Representative from Gjoa Haven noted that they did not like the idea of building dikes or dams because of potential impacts to fish and wildlife.[298,299] In response to suggestions that bridges could be used instead of dikes, Sabina noted that only two (2) small waterways would be blocked by the Project, and any proposed dikes or berms are in reference to keeping contact water or tailings in place. [300]

During the supplemental Final Hearing, a Community Representative from Kugluktuk commended Sabina for working with the HTO on the Bernard Harbour offsetting project.[301] The representative went on to note that McGill University and the Science Centre in Montreal had recently picked the Bernard Harbour Fish Restoration Project and the Coppermine River Water Quality, another project the Kugluktuk HTO is working on, to be part of the Top 6 out of 60 projects across Canada for showcasing Aboriginal and Indigenous climate change adaptation. Sabina replied that it is proud of the project and hopes to maintain a strong relationship with the HTO throughout the project life. Kugluktuk Community Representatives also thanked the KIA, DFO, and Transport Canada for supporting the Bernard Harbour restoration project, noting that the project is an example showing how an Inuit organization and Traditional Knowledge can work hand in hand with industry and western science.[302,303]

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[295] J. Judas, Wekweètì, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 725-726, lines 18-26 and 1-12.

[296] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 730, line 10.

[297] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 729-730, lines 20-26 and 1-23.

[298] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 694-695, lines 23-26, 1-2.

[299] M. Aglukkaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 690, lines 6-7.

[300] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 697, lines 5-14.

[301] L. Adjun, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 669, lines 1-16.

[302] J. Palongayak, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 861, lines 2-5.

[303] L. Adjun, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 978, lines 14-23.

4.9.3 Views of the Board

During the 2016 Final Hearing, the Board requested clarification on the depths of the two (2) lakes that would be dewatered, whether the lakes have fish, what would happen to the fish during dewatering, and the proposed process following closure and reclamation.[304] In response, Sabina noted that Llama Lake is approximately 13 metres deep and has three (3) species of fish (Lake Trout, White Fish and Arctic Grayling) while Umwelt Lake is approximately three (3) metres deep and has two (2) species of fish (Lake Trout and Arctic Grayling). Sabina also noted that the fish would be removed prior to dewatering of the lakes, as per the proposed fish-out program provided in the FEIS, and the lakes would be re-flooded during closure. The Board also asked what would happen to the fish removed from the lakes, questioning whether the fish would be "*…removed into another lake, if so, is there any danger of overpopulating a lake with – with that many fish? I raise that because there could be, you know, depletion of food for the resident fish in the other lake".*[305] In response, Sabina indicted that the potential for movement of the fish to another lake would be established with Fisheries and Oceans Canada (DFO) and only with agreement with the Kitikmeot Inuit Association (KIA) during the regulatory phase. Sabina noted that it was considering options for the fish to be caught, processed, and supplied directly communities as it is not generally recommended to move fish from one waterbody to another for ecological reasons such as those articulated by the Board's question.[306]

During the 2016 Final Hearing, the Board further requested clarification whether the Fish Offsetting Plan included the 51 lakes proposed for the winter ice road and whether details were provided on how often the lakes are used by people and wildlife.[307] Sabina noted that the Fish Offsetting Plan did not include the lakes proposed for the winter ice road as it would only withdraw amounts that would not impact fish populations; however, adding that it would continue discussions with DFO and the KIA. With respect to the details on how often the lakes are used by people and wildlife, Sabina clarified that it conducted land use studies in Kugluktuk and Cambridge Bay as well as a Traditional Knowledge study which included the entire length of the proposed winter ice road, the Marine Laydown Area, and the Goose Property. Sabina indicated that based on this study, no areas were identified as particularly sensitive or important for use by Inuit.[308] The Board also asked DFO if it is "*…aware of studies that look at the potential impacts of ice roads on fish populations and behaviour, either near settlements or other ice roads?"*[309] DFO responded that literature is available from the diamond mining industry in the Northwest Territories and from earlier work done in the Mackenzie Delta and the Beaufort Sea area for oil and gas development. DFO noted that the literature indicates fish in Nunavut would not be

[304] H. Ohokannoak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 156-157, lines 22-26 and 1-4

[305] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 158-159, lines 23-26 and 1-4.

[306] K. Marchinko, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 159, lines 6-14.

[307] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p.160, lines 6-8 and 22-23.

[308] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p.160-162, lines 9-19, 7-26 and 1-2.

[309] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 499, lines 4-7.

negatively impacted from truck noise on the ice roads as most of the fish present are not particularly sensitive in hearing.[310]

In 2016 the Board also requested further clarification on what lakes are included within the requirement for an offsetting plan.[311] DFO indicated that it examined all waterbodies where work is being proposed to occur, including water withdrawal, placement of an outfall pipe, and/or structures within water.[312]

The Board concluded in the 2016 Final Hearing Report that it was not confident that the mitigation measures as proposed would be sufficient to mitigate effects because of limited consideration of Inuit Qaujimaningit principles in the project design regarding the planned fish-out and dewatering of multiple lakes, and limited data presented on the lakes that could be disrupted due to water extraction associated with the winter ice road. Further, although the Board recognized that the Bernard Harbour offsetting plan was clearly supported by parties, there was a lack of assurance that it would be sufficient to offset all anticipated *serious harm to fish* caused by the Project. In the 2016 Final Hearing Report, the Board also noted that effects to fish and fish habitat may arise due to climate change impacts on water temperature, air temperature, precipitation, and ultraviolet radiation, and these impacts may interact with the Project to cause cumulative effects on fish and freshwater biota.

After reviewing the new information provided by Sabina in the FEIS Addendum and the supplemental Final Hearing as well as the updated views of Parties, the Board has determined that the relevant issues have been adequately addressed for this stage of assessment. In particular, the Board acknowledges the additional information provided by Sabina regarding the fish-out plan, fish offsetting plan, fish passage memo, and winter ice road water withdrawal memo increased the Board's confidence that project effects could be appropriately mitigated or offset. The Board's preference would be that all aquatic habitat is protected and maintained; however the Board recognizes that Sabina will work with DFO to establish appropriate fish habitat compensation, and that the proposed compensation measures, in particular the Bernard Harbour offsetting plan, are well supported by Parties. The Board also acknowledges a commitment by Sabina to work with local communities and the KIA to develop an appropriate fish-out plan and relocation or use of the fish. Finally, the Board is aware that there are a number of issues such as the fish-out plan and fish offsetting plan and thresholds for blasting that will require further consideration and approval by the respective regulatory authorities during the regulatory phase.

4.9.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board concluded that it is not confident that the mitigation measures as proposed would be sufficient to mitigate effects on freshwater aquatic habitat because of insufficient detail as well as limited consideration of Inuit Qaujimaningit principles in the project design. After reviewing the new information provided by Sabina in the FEIS Addendum and the supplemental Final Hearing as well as the updated views of Parties, the Board believes that the Project's potential effects related to the freshwater aquatic environment could be appropriately managed through the

[310] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 499, lines 10-26.
[311] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 500, lines 2-7.
[312] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 500-501, lines 10-26 and 1-10.

commitments provided by the Proponent and application of mitigation measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Maintain appropriate setbacks or mitigation between project quarries and fish-bearing or permanent waterbodies to prevent acid rock drainage or metal leaching into such waterbodies;
- Designing project infrastructures in watercourses to reduce barriers of water movement in fish bearing streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada;
- Exploring possible Project specific thresholds, monitoring, and required mitigation where based on 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);
- Engage with interested parties during the regulatory phase on the design, construction, and operation of adequate fish passage to permit migration of Arctic Grayling from Goose Lake to natural spawning and rearing habitats located in upper Rascal Stream East;
- Update bathymetry, depth and location of proposed water withdrawal sites, volumes to be extracted, anticipated water level decreases, and fish habitat features within each waterbody proposed to be used for winter water withdrawal in support of the construction of the winter ice roads;
- Implement best management practices to avoid and mitigate serious harm to fish as a result of the construction, operation, and decommissioning of winter ice roads, and from under ice water withdrawals;
- Implement best management practices to avoid and mitigate serious harm to fish as a result of water crossing construction, operation, and decommissioning for all fish-bearing water crossings;
- Implement monitoring program for culverts on fish bearing watercourses during operations and closure to ensure that barriers to fish passage do not form; and
- Provide annual monitoring reports regarding the Rascal Stream Fish Passage that enables parties to determine its effectiveness.

The Board further notes that a recommended term and condition in Section 4.7.4: Groundwater and Surface Water Quality relates to the Proponent maintaining an Aquatic Effects Monitoring Plan is relevant to the Freshwater Aquatic Environment.

4.10 VEGETATION

4.10.1 Views of the Proponent

Sabina provided its assessment of potential project-induced effects on vegetation in Volume 5, Section 4 of the FEIS. Sabina included terrestrial vegetation and special landscape features (e.g., eskers, wetlands, and cliffs) in its overall assessment based on results from community consultation, the ecological importance of vegetation in providing important habitat for wildlife species, and the limited representation of certain landscape features and their higher likelihood to support rare or unique plant

species or communities. Supporting baseline information, including detailed reports on rare plant, invasive plant, and lichen species, was provided in Volume 5, Appendix V5-4A: Back River Project – 2012 Ecosystems and Vegetation Baseline Report.

Resulting from its assessment of potential project interactions with vegetation and special landscape features, Sabina predicted the occurrence of two (2) potential residual effects: vegetation loss and special landscape feature loss. The potential residual effects were determined, contingent on the application of mitigation measures contained in Volume 10 of the FEIS, to be not significant based on their expected long-term duration, but low magnitude and limited spatial extent. Sabina identified the potential for interaction with three (3) future projects within the Regional Study Area (RSA), and estimated the potential cumulative loss of 557 hectares (ha) due to future road and infrastructure development. Sabina predicted the potential cumulative effects to be not significant based on their expected low magnitude, permanent and long-term duration, and confined spatial extent. Sabina concluded that no transboundary effects would occur based on the determination that the predicted residual and cumulative effects would be confined to the Potential Development Area(s) (PDAs), Local Study Area (LSA), or RSA, all within Nunavut.

Sabina identified the following three (3) spatial boundaries for its assessment of potential project-induced impacts on vegetation and special landscape features:

- *Potential Development Areas* (PDA) — includes the project footprint which encompasses areas of planned infrastructure at the Goose Property and the Marine Laydown Area (MLA), in addition to one (1) kilometre (km) buffers around each PDA.
- *Local Study Area* (LSA) — includes the Goose Property and MLA PDAs, connecting winter ice roads, the George exploration camp area, in addition to sub-watershed areas used as the LSA boundary where watersheds encompassed proposed project components and were considered as large as areas of potential loss or degradation.
- *Regional Study Area* (RSA) — includes the Goose Property and MLA PDAs, the LSA, and a 35 km buffer on either side of all proposed infrastructure and connecting winter ice road corridors for a total assessment area of 1,262,005 ha.

The temporal boundaries identified in Sabina's assessment aligned with all project phases, including mobilization, construction, operation, reclamation, and post-closure monitoring (see Section 2.2.3: Project Phases).

Sabina based its assessment of potential project effects on vegetation and special landscape features using two (2) indicators: loss of vegetation and special landscape features, and degradation of vegetation. Sabina indicated that the majority of potential direct vegetation loss would occur from the physical clearing of areas for infrastructure at the Goose Property and MLA PDAs during the construction and operations phases, with small incremental losses potentially occurring during the reclamation and closure phases. Sabina stated that potential effects contained in its assessment of vegetation degradation included physical disturbances causing bare soil exposure leading to soil erosion and the introduction of invasive species; impacts from airborne fugitive dustfall; potential project-related changes to water quality and quantity, permafrost, snow accumulation, active growth layers; and other indirect impacts. For its analysis of the indicators noted above, Sabina identified proposed project components with the potential to interact with vegetation or special landscape features. Proposed components included open pits, camp, plant, landfill, and airstrip sites; winter and access

roads; stockpiles, waste rock, tailings, and explosives storage areas; quarries; the barge landing area; and other smaller site infrastructure (e.g., diversion channels, water intakes, and interception ditches).

In its assessment, Sabina proposed mitigation, monitoring, and adaptive management measures designed to eliminate or minimize potential project effects on vegetation and special landscape features. Proposed mitigation measures included: optimized design measures to confine and minimize the project footprint within local watersheds and to capitalize on the use of winter ice roads; dust reduction and maintenance measures for roadways, heavy machinery, and operational infrastructure; and the application of adaptive management protocols based on results from various monitoring plans. Sabina provided additional information pertaining to the above mitigation, monitoring, and adaptive management measures in Volume 10 of the FEIS.

Sabina's assessment of potential project-induced effects on vegetation and special landscape features resulted in the predicted occurrence of two (2) residual effects: vegetation loss and special landscape feature loss. Sabina noted that for planning purposes, it assumed that both PDAs would experience a total loss of vegetation and landscape features. However, it was noted that the expected realized losses would be less considering the Goose Property and MLA physical infrastructure footprints represent only 12.3% and 27.5% of their respective PDAs. Sabina noted that collectively, these total PDA losses would represent 4.8% of the baseline distribution for vegetated ecosystems within the LSA, and less than one percent (1%) within the RSA. Sabina predicted that the greatest losses in the Goose Property and MLA PDAs would be from the mesic and marine dwarf shrub tundra ecosystems, respectively.

Sabina's assessment also included predicted losses within ecosystem classes including the bedrock, disturbed/barren, esker, marine beach, tundra, riparian, riparian marine, wetland, wetland marine, freshwater, and marine ocean classes. Sabina indicated that losses within ecosystem classes would be below 10% of their respective baseline distributions in the LSA, with the exception of the marine beach (13%) and riparian marine (20%) ecosystems. These classes were noted to be commonly observed beyond the LSA boundary and throughout the RSA. Sabina concluded that the total vegetated area loss within the LSA would be 5,226.8 ha.

Sabina estimated the loss of special landscape features would be four percent (4%) of their collective distribution within the LSA, similar to values for vegetated ecosystem loss, with the majority of losses from wetland ecosystems in the Goose PDA. Losses for the majority of specific features would also be below 10% of their respective baseline distributions, with the exception of the marine beach, marine riparian shrub, and old beach head classes.

Sabina anticipated, contingent on the application of mitigation measures, that the potential residual effects would be not significant based on their long-term duration, but low magnitude and limited spatial extent. Sabina defined low magnitude as an expected loss of one percent (1%) to 10% of LSA availability. Sabina also indicated that the predicted residual effects were assumed to be irreversible, but that recovery may occur post-closure. Based on quantitative and qualitative analysis, Sabina also noted that vegetation would not be degraded as a result of the Project due to fugitive dust, airborne emissions, or other media (see Country Foods within Section 6.1: Human Health and Environmental Risk Assessment).

Due to the predicted occurrence of residual effects, Sabina conducted an assessment of potential cumulative effects within the RSA boundary. Within its assessment, Sabina identified the potential for interaction with three (3) future projects: the Hackett River Base Metals Mine, Bathurst Inlet Port and

Road (BIPR) projects, and the George Property. Sabina estimated that an additional 557 ha of cumulative loss could occur within the RSA resulting from the potential development of roads and infrastructure associated with the three (3) projects. Sabina indicated that only the future BIPR and George Property Project would result in cumulative loss within the LSA due to the proposed port location.

Sabina noted that mitigation and monitoring plans are not yet available for the future Hackett River Base Metals Mine Project; however, mitigation and monitoring measures for both the Hackett River Base Metals Mine and George Property projects are expected to be consistent with those presented for the Back River Project. Sabina indicated that proposed mitigation and monitoring plans developed for the BIPR project would include a vegetation management plan and invasive plants management plan. Sabina noted that the coordination of these plans with Sabina's existing proposed plans would further minimize the potential for adverse effects on vegetation.

Sabina concluded that the estimated cumulative loss of all three (3) projects would be less than one percent (1%) of the RSA and would be considered low in magnitude with long-term duration, limited spatial impact, continuous and permanent frequency, and confined spatial extent. Based on these determinations, Sabina predicted the potential residual cumulative effect (vegetation loss) for vegetation and landscape features to be not significant. Sabina further concluded that no transboundary effects would occur based on the determination that the predicted residual and cumulative effects would be confined to the PDAs, LSA, or RSA, which are all within Nunavut.

Within Volume 5, Section 4 of the FEIS Addendum Sabina provided its response to the Board's concerns related to vegetation, as expressed in the 2016 Final Hearing Report. Sabina organized its response by grouping four (4) topics it viewed as the Board's concerns: limited baseline information (FHR-NIRB-4.10(A)); additional mitigation, monitoring, progressive reclamation, and revegetation measures (FHR-NIRB-4.10(B)); measures to limit the introduction of invasive species (FHR-NIRB-4.10(C)); and measures to quantify impacts from planned annual construction and operation of the winter ice road (FHR-NIRB-4.10(D)). As part of its response, Sabina indicated that none of the additional information presented in the FEIS Addendum affected Sabina's conclusions as originally presented in the FEIS. Sabina provided a new Vegetation Monitoring Plan (VMP) within Volume 10 of the FEIS Addendum.

Sabina noted its view in the FEIS Addendum that it provided a sufficient level of baseline vegetation information in the FEIS within the 2012 Ecosystems and Vegetation Baseline Report (FEIS Appendix V5-4A). Sabina stated that throughout the Review of the Back River Project, only one (1) comment was received regarding vegetation baseline data through the DEIS and FEIS technical review phases, which was addressed, and limited baseline vegetation data was not an issue raised by parties, the Board, or NIRB staff during the 2016 Final Hearing.

Sabina discussed two (2) topics that it felt may have created uncertainty for the Board: the proposed realignment of the proposed winter ice road north of Tahikafflok Lake (Bathurst Lake), and the Kitikmeot Inuit Association's (KIA) past concern that Sabina would be placing significant fill material on the over-land portions of the proposed winter ice road alignment. Sabina noted that in response to Traditional Knowledge collected and a request by the KIA, it had realigned a 5.5 kilometre (km) section of the proposed winter road route to address potential impacts to riparian zones identified during two (2) local focus group workshops in Cambridge Bay and Kugluktuk. Sabina noted that this commitment was made during the Draft Environmental Impact Statement (DEIS) stage, that 96% of the proposed deviation would be on lakes, and that the deviation is not expected to change the evaluation of effects, nor the

identification of potential effects, for any of the terrestrial wildlife Valued Ecosystemic Components, including vegetation. Regarding the use of fill material for the overland portions of the proposed winter ice road, Sabina reiterated its expectation that the road would be constructed using snow and ice only, and should minor amounts of granular fill be required, it would ensure that all proper terrestrial assessments would be completed.

Sabina provided highlights of its 2012 Ecosystems and Vegetation Baseline Report and committed to performing a vegetation assessment of the portion of the winter ice road that was realigned and that would be outside of the FEIS Local Study Area.

In response to the Board's concerns as expressed in the 2016 Final Hearing Report on the need for additional mitigation, monitoring, progressive reclamation, and revegetation measures, Sabina provided a review of proposed commitments, measures, and plans related to vegetation mitigation, monitoring, reclamation, and revegetation made to parties throughout the NIRB's Review process. Sabina also provided a new specific Vegetation Management Program (VMP) with the following objectives:

- Measure plant species abundance and diversity at vegetation plots along the winter ice road, Marine Laydown Area (MLA), and Goose site;
- Measure direct loss of plant communities resulting from the construction and operations of project infrastructure at Goose Property, the MLA, and winter ice road;
- Measure plant health (vigour) as part of the vegetation monitoring program;
- Measure distribution and abundance of non-native invasive plant species;
- Monitor and evaluate the effectiveness of mitigation measures;
- Identify unanticipated effects; and
- Provide an early warning of undesirable change in the environment and to inform adaptive management measures.[313]

In response to the Board's concerns related to revegetation and reclamation, Sabina highlighted discussions and commitments made during the Review of the Project, measures and commitments contained within its Mine Closure and Reclamation Plan (FEIS Volume 10, Section 29), and reiterated its commitment to researching substrate and plant species selection trials, soil and plant processes, and progressive revegetation monitoring.

In response to the Board's concerns related to progressive reclamation as expressed in the 2016 Final Hearing Report, Sabina provided clarification on definitions as well as summaries of progressive reclamation measures which it committed to incorporating within Section 4.0 of its next version of the Mine Closure and Reclamation Plan. Sabina presented further clarification on what constitutes progressive reclamation and opportunities for progressive reclamation, while also providing progressive reclamation summaries for:

- Waste Rock Storage Areas;
- Tailings Storage Facility;
- Open Pits and Tailings Facility;

[313] FEIS Addendum, Volume 10, pt. 5, Vegetation Monitoring Plan, p. 10

    - Llama reservoir, Umwelt Tailings Facility, Goose Main Tailings Facility, Echo Pit
- Underground Mines;
    - Llama Underground
    - Umwelt and Goose Main Underground
    - Echo Underground
- Buildings Equipment and Infrastructure; and
- Contaminated Materials and Waste Disposal

Sabina noted that during the review of both the DEIS and FEIS, it had received one (1) comment from parties relating to invasive species, which was responded to and addressed during the DEIS phase. Sabina indicated that the Proponent had used two (2) regional classification systems to map ecosystems in the Regional Study Area, and that in the Local Study Area, no invasive species were identified. Sabina further added that its baseline studies included a combination of ecosystem classification and mapping, field verification, rare plant surveys, invasive plant surveys, and plant tissue collection for baseline metals analysis. Sabina also discussed the potential for invasive species to be introduced to the project area through various pathways, including the movement of machinery and equipment, and reiterated its commitment to apply best management practices to reduce the potential for introduction and spread of invasive species. Sabina also committed to adhere to relevant guidance such as Fisheries and Oceans Canada's Measures to Avoid Causing Harm to Fish and Fish Habitat, and noted a measure specific to invasive species which requires the proper cleaning of maintenance of machinery. Sabina further indicated that its new VMP includes additional information to further clarify its approach to invasive species management, which includes supplemental invasive plant species mitigation measures as well as an approach to invasive plant species monitoring.

Sabina noted that during the 2016 Final Hearing, the Government of Nunavut (GN) agreed that its joint submission with Sabina met the requirement to quantify impacts from planned annual construction and operation of the proposed winter ice road. Sabina highlighted the commitment and noted that its new VMP includes the measures detailed in the joint submission, and that the plan quantifies impacts from planned annual construction and operation of the winter ice road.

4.10.2 Views and Concerns of Interested Parties

In its 2016 final written submission, the Government of Nunavut (GN) observed that in the FEIS it was assumed that potential impacts to vegetation resulting from the proposed winter ice road would be minor and that potential interaction between the Project and the natural environment was not carried forward into the assessments for vegetation or wildlife.[314] The GN stated that given the exceptionally long recovery times of arctic tundra vegetation communities following destruction or modification, the Proponent should attempt to validate the assumption that potential impacts from the proposed winter ice road would be minor. As such, the GN recommended that Sabina undertake vegetation monitoring along the winter ice road alignment for the duration of the Project and ensure the findings from these studies are used to inform reclamation planning. The GN reiterated this recommendation during the 2016 Final Hearing and agreed with the Proponent's suggested term and condition to meet this recommendation with the suggested additional wording that Sabina consult with the GN and other

[314] Government of Nunavut, 2016 Final Written Submissions, March 7, 2016.

relevant authorities.[315] In response to the GN's 2016 final written submission, Sabina committed to develop and implement a vegetation monitoring plan for the winter ice road that would be designed to quantify potential impacts on vegetation.[316] The plan would be submitted to the NIRB prior to construction of the winter ice road and findings from these studies would be used to inform reclamation planning as appropriate.

The North Slave Métis Alliance (NSMA) noted within its 2016 final written submission that the Proponent did not plan to revegetate the disturbed areas as part of its intended progressive reclamation nor after closure of the mine.[317] The NSMA noted concern that given the significance of the site as the potential future calving ground for caribou, it would be important that Sabina make the best effort to restore the habitat quality and recommended that Sabina commit to conduct research on new technology to accelerate the revegetation of disturbed sites. In response to the concerns raised in the 2016 final written submission, Sabina indicated that its Mine Closure and Reclamation Plan provided proposed progressive reclamation activities that would evolve during the operation phase of the Project. Sabina further noted that potential research studies include numerous topics and the progress of these possible options would be dependent on the advancement of project plans, closure plans, and timing. During the 2016 Final Hearing, the NMSA noted that Sabina indicated in its response to the 2016 final written submissions that there were three (3) potential research topics related to revegetation and requested clarification on the ongoing research related to revegetation. The NMSA requested a commitment from Sabina to conduct research related to revegetation to ensure minimum cumulative impacts on wildlife habitat.[318] In response, Sabina indicated that regulators requested that Sabina look at revegetation options at closure. Sabina stated that while it did conduct a desktop review based on the baseline data collected that resulted in the three (3) potential research studies, at this time no research has been completed. It was further noted that any research regarding revegetation would follow approval of the proposal and could occur following closure of the waste rock storage areas. Sabina further noted that it has committed to an ongoing research program that would start at the construction stage.[319,320] During its presentation at the 2016 Final Hearing, the NMSA re-iterated its request to Sabina to commit to revegetation research specifically in relation to the three (3) potential research topics that Sabina identified.[321]

The Yellowknives Dene First Nation requested clarification during the 2016 Final Hearing regarding the research that would be undertaken to address habitat loss through revegetation efforts or through mitigation measures.[322]

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[315] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 419, lines 1-13.
[316] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[317] North Slave Métis Alliance, 2016 Final Written Submissions, March 7, 2016.
[318] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 295, 297, 298, lines 11-21, 7-13, 15-25.
[319] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 296-297 and 298, lines 17-26, 1-4 and 1-11.
[320] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 300, lines 12-20.
[321] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 725, lines 7-14.
[322] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 326, lines 17-23.

Within its final written submission on the FEIS Addendum, the Government of Nunavut (GN) expressed concerns that the new Vegetation Monitoring Plan (VMP) lacked details regarding the size, number, and distribution of vegetation monitoring plots, the timing and frequency of monitoring, and the methods of data collection. The GN noted that the lack of detail made it difficult to quantify the potential impacts of the proposed winter ice road on vegetation. Further, the GN noted that the VMP should monitor effects on plant diversity through both species richness and relative abundance, and that it was unclear whether the study design would support the estimation of key metrics of vegetation change along the proposed winter ice road alignment. The GN noted that, ideally, these metrics would inform reclamation planning and future impact assessments related to the operation of winter ice roads.

Sabina indicated in its response to the final written submissions on the FEIS Addendum that the VMP is a conceptual plan to address a jointly-submitted proposed term and condition submitted during the 2016 Final Hearing. Sabina noted that through further discussion with the GN, it agreed to the GN's recommended modification to the proposed term and condition which would include consultation requirements with the Kitikmeot Inuit Association (KIA), the GN, and other relevant parties for the development and implementation of a VMP for the winter ice road. It was stated that the VMP would be designed to quantify the potential impacts on vegetation including, but not limited to, total estimated areas subject to vegetation loss and changes in abundance and/or diversity, changes in abundance and/or diversity, and introduction of invasive species, and would require submission to the NIRB prior to construction and use of findings to inform reclamation planning. During the supplemental Final Hearing, the GN confirmed that its concerns related to the VMP were resolved based on Sabina's commitments.[323]

Within its final written submission on the FEIS Addendum, the North Slave Métis Alliance (NSMA) expressed concern that Sabina did not appear to commit to revegetating disturbed areas during progressive reclamation operations or after the closure of the mine. The NSMA acknowledged the challenges involved with revegetation in the Arctic, and requested that the Proponent commit to researching new technologies to accelerate the revegetation of disturbed areas. In its response to the NSMA's submission, Sabina agreed with the recommendation and highlighted measures within the FEIS Mine Closure and Reclamation Plan to conduct revegetation research on large footprint areas to improve long-term stability and usability following closure. Sabina clarified that this research would consider the use of new methodologies and technologies focussed on improving revegetation on northern projects, such as the Back River Project.

For additional discussions related to the mitigation of potential effects (including effects on vegetation) from spills or accidents or malfunctions, see Section 6.2: Accidents and Malfunctions Assessment.

During the supplemental Final Hearing, a Community Representative from Omingmaktok (Bay Chimo) questioned Sabina on what would occur should the winter ice road melt earlier than April. In response, Sabina noted that it would be monitoring conditions closely and that April 15 would be the last operational day each year. Sabina noted that similar to the Tibbit-Contwoyto road in Nunavut and the Northwest Territories, if the winter ice road started to melt early it would be closed.[324]

[323] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 449-450, lines 18-26 and 1-6.
[324] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 658, lines 7-20.

During the supplemental Final Hearing, a Community Representative from Kugluktuk expressed concerns regarding the seasonal development and use of the winter ice road and the potential for impacts to the land and tundra due to variability in snow accumulation as a result of climate change. The representative questioned Sabina on its threshold for snow depth for the development and operation of the winter ice road. In response, Sabina acknowledged that changes in snow patterns are occurring, and clarified that the minimum depth required on the road would be 10 centimetres (cm) of compacted snow. Sabina further noted that generally it would take 20 cm to 25 cm of unpacked snow to achieve the required thickness, and that it could take until January or February to achieve that level. Sabina added that it has been monitoring snow thickness and could install snow fencing to assist with snow accumulation along the winter ice road. Sabina also noted that it would only require approximately six (6) to seven (7) weeks as an operational window for the ice road in order to meet its resupply and trucking needs, and based on current conditions it is expected that the operational window is currently in the range of 12 to 15 weeks.[325]

During the supplemental Final Hearing, a Community Representative from Taloyoak commented on changes in country food he had experienced during his lifetime, noting that these changes could be a result of climate change or animal behaviour. Sabina responded that it is committed to monitoring various aspects, including dust emissions, which could potentially have impacts on vegetation and subsequently on wildlife and wildlife harvesters.[326] For additional discussions related to dust and dust-related impacts refer to Section 4.11: Terrestrial Wildlife and Wildlife Habitat, Section 4.1: Air Quality, and Section 6.1: Human Health and Environmental Risk Assessment.

4.10.3 Views of the Board

Within the 2016 Final Hearing Report the Board recognized that although Sabina conducted baseline studies to characterize the baseline ecosystems and vegetation present within the local and regional study areas of the proposed Project in 2012, it had considerable uncertainty owing to the limited availability of baseline data in the project area, particularly in areas associated with the proposed winter ice road. The Board further noted its concern with the potential for changes and impacts to vegetation in the area that may be affected by the Project, concerns related to the potential effectiveness of revegetation during reclamation due to there being limited examples of projects in similar settings, and concerns with potential impacts from the construction and operation of the winter ice road, as well as well as daily traffic throughout the mine site.

During the supplemental Final Hearing, the Board requested that Sabina elaborate on the locations and frequency of sampling proposed within the Vegetation Monitoring Plan (VMP) along the proposed winter ice road. The Board further requested that Sabina specify whether sampling would be passive or active, as well as the rationale behind choosing sampling locations, considering the winter ice road would utilize lakes and would involve the development of ramps.[327] In response, Sabina stated that the VMP would look specifically at the potential effects of the winter ice road on vegetation communities by pairing sampling locations that would be located along the road alignment as well as in adjacent

[325] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 823-825, lines 9-26, 1-26, and 1-17.
[326] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 699-700, lines 4-26 and 1-17.
[327] K. Kaluraq, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 257, lines 7-15.

undisturbed areas. Sabina clarified that results would be stratified based on the different types of vegetation communities and different potential levels of disturbance from the winter ice road. Sabina noted that sampling would occur in areas where predictions indicate the road could have greater impacts, as well as areas with less predicted impact, but that the exact study locations had not been determined.[328]

The Board acknowledges Sabina's recognition of its concerns as previously expressed, and appreciates the particular focus applied by Proponent in the FEIS Addendum to address the Board's uncertainties related to vegetation. The Board notes that as a result of the additional information provided within the FEIS Addendum, particularly the conceptual Vegetation Monitoring Plan, as well commentary provided during the supplemental Review phase, it has increased confidence in the Proponent's ability to proactively mitigate, monitor, and adaptively manage impacts to vegetation that could be realized during the Project. However, the Board notes that although the conceptual VMP provides a framework for vegetation monitoring and management, ongoing refinements should consider the collection of additional baseline data to maintain an accurate understanding of vegetation features in the area, and to effectively identify and respond to potential impacts, as well as invasive species. Further, particular care should be taken by the Proponent in selecting appropriate methods for all reclamation activities, including revegetation, and Sabina should seek out relevant and applicable examples of vegetation management and reclamation operations in similar environments to supplement its ongoing vegetation management and reclamation efforts. In this regard, the Board continues to emphasize the importance of Inuit Qaujimaningit and notes that the potential for the Project to impact upon the abundance and distribution of unique or valuable plants can affect the importance of the landscape, as perceived by Inuit that use the areas in proximity to the project area (i.e., aesthetics and availability of country food). This should be considered by Sabina throughout the life of the Project and communities should be informed of the results of studies on vegetation sampling and the efficacy of dust control as inferred by results from vegetation surveys.

The Board also notes its expectation that the Proponent will apply particular caution in the seasonal development, use, maintenance, and closure of the winter ice road to ensure that all potential impacts to vegetation are mitigated, monitored, and adaptively managed throughout the Project. This caution should include a precautionary approach to establishing operational schedules, and maintenance protocols, for the winter ice road to ensure protective road depths are maintained at all times.

4.10.4 Conclusions and Recommendations of the Board

Resulting from the information provided throughout the Review processes, discussions and commentary provided between parties, and in particular the additional information provided by the Proponent within the FEIS Addendum, the Board has increased confidence in the Proponent's ability to manage impacts that could be realized as part of the Project, in particular throughout site operations as well as the planned seasonal construction and operation of the winter ice road. The Board also has increased confidence in the Proponent's ability to employ effective measures for the reclamation and recovery of vegetation in the project areas. In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to vegetation could be appropriately managed through the commitments provided by

[328] C. De La Mare, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 257-258, lines 22-26 and 1-19.

the Proponent and requiring key mitigation and monitoring measures as outlined below (the text that follows is brief summary of the recommended terms and conditions and is provided for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Minimizing the Project footprint;
- Implementing various measures to ensure that equipment and supplies brought to the project sites do not introduce invasive vegetation species;
- Developing and implementing a specific Vegetation Management Plan to minimize the potential for impacts to vegetation along the winter road/trail routings and around project sites;
- Developing a progressive revegetation program for disturbed areas that are no longer required for operations; and
- Including revegetation strategies within the Project's Mine Closure and Reclamation Plan to support progressive reclamation and revegetation of project sites.

4.11 TERRESTRIAL WILDLIFE AND WILDLIFE HABITAT

4.11.1 Views of the Proponent

Sabina provided its assessment of potential project-induced effects on terrestrial wildlife and wildlife habitat in Sections 5, 6, 7, and 8 of the FEIS. Sabina included caribou (Section 5), grizzly bear (Section 6), muskox (Section 7), and wolverine and furbearers (Section 8) in its overall assessment of the terrestrial wildlife environment based on their potential interaction with the proposed project, consultation with regulatory authorities, results from community consultation, and the incorporation of Traditional Knowledge. Sabina noted that other aspects considered in its selection of the wildlife VECs included species at risk or of conservation concern; species requiring enhanced consideration under regulatory mandates; species identified for having strong biological importance in the study area; and species identified as being culturally, socially, and economically important to Inuit and other community members. Supporting baseline information, including details on individual species and habitat studies, was provided in Appendices V5-5A to V5-6B. Sabina noted that baseline data was collected for its assessment of respective wildlife species using a variety of methods including satellite collaring, motion-triggered cameras, aerial surveys, denning and land surveys, DNA mark-recapture studies, species-specific habitat suitability modelling, and the incorporation of Inuit Traditional Knowledge.

Sabina's assessment of potential project-induced effects on terrestrial wildlife species resulted in the predicted occurrence of the following residual effects:

- Habitat Loss (caribou, grizzly bear, muskox, wolverine, and grey wolf);
- Disturbance due to noise (caribou, grizzly bear, muskox, wolverine, and grey wolf);
- Attraction (grizzly bear and wolverine); and
- Reduction in reproductive productivity (caribou, grizzly bear, muskox, and wolverine).

Sabina predicted, contingent on the application of mitigation measures, that all predicted residual effects would be not significant. For each wildlife species assessed, Sabina also conducted cumulative effects assessments (CEA) for all predicted residual effects identified as having potential interaction with

past, present, or foreseeable developments in Nunavut and the Northwest Territories (NWT). Based on Sabina's expectation that other projects would have mitigation measures similar to those proposed for the Back River Project, Sabina determined that all residual cumulative, and transboundary, effects would be not significant.

Sabina identified the following two (2) spatial boundaries for its assessment of potential project-induced impacts on the terrestrial wildlife environment:

- *Local Study Area* (LSA) — Includes the Goose Property and Marine Laydown Area (MLA) Potential Development Areas (PDA), connecting winter ice roads, the George exploration camp area, in addition to sub-watershed areas used as the LSA boundary, for a total assessment area of 134,369 (ha).
- *Regional Study Area* (RSA) — Includes the Goose Property and MLA PDAs, the LSA, and a minimum 35 kilometre (km) buffer on either side of all proposed infrastructure and connecting winter ice road corridors for a total assessment area of 1,262,005 ha.

The temporal boundaries identified in Sabina's wildlife assessment aligned with all Project phases including construction, operation, reclamation, and post-closure monitoring (see Section 2.2.3: Project Phases).

Sabina selected sustained population health as the key criterion to assess potential project-induced residual effects for all wildlife VECs. To evaluate this criterion, Sabina identified eight (8) potential effects that could occur through the interaction of wildlife with project components. The potential effects, developed from relevant scientific literature, professional judgement, experience at similar projects in Nunavut and the NWT, Traditional Knowledge, include: habitat loss, disturbance due to noise, disruption to movement, direct mortality and injury, indirect mortality, attraction, exposure to contaminants, and reduction in reproductive productivity (due to all effects of the project combined). The potential effects identified were assessed in relation to project components in the Goose Property and MLA, including open pits, camps, processing plant, landfill, airstrip sites, winter and access road infrastructure, stockpiles, waste rock piles, tailings, explosives storage areas, quarries, the barge landing area, and other smaller infrastructure (e.g., diversion channels, water intakes, interception ditches).

Within Sabina's respective assessments, direct habitat loss was attributed to the development of infrastructure and project components within the respective PDAs. Potential habitat loss for each species was calculated by comparing the total impacted area within the PDAs to suitable species-specific habitat values, developed through habitat suitability modelling. Noise modelling for wildlife was based on the estimation of potential zones of influence (ZOI) around project activities and components, and the calculation of potential noise levels in those areas in excess of:

- 108 decibels (dB; instantaneous noise);
- 180 dB for blasting;
- 45 dBA (continuous noise) for general project noise; and
- 80 dBA for aircraft noise.

Sabina noted that ZOIs and the respective thresholds were established based on relevant literature, regulatory noise level guidelines, and specific scientific observational data for mammal noise response thresholds. Sabina used noise modelling values from Year 3 of operations for its assessment, as it was

identified as the year when overall project noise would be at its high-highest and could represent worst-case noise conditions.

In its analysis of potential project-induced effects on wildlife VECs, Sabina considered mitigation, monitoring, and adaptive management measures included in its Wildlife Mitigation and Monitoring Program Plan (WMMPP) designed to reduce or eliminate potential effects on wildlife (Volume 10, Section 20). Measures proposed to mitigate potential impacts to wildlife included: optimized project design measures to site project infrastructure away from sensitive wildlife areas (e.g., caribou calving areas, high-use wildlife areas, and denning areas); measures to reduce dustfall from operations and storage areas; measures to design and maintain infrastructure to exclude wildlife; specific waste and chemical management protocols; noise abatement and attraction reduction measures; use of open-water shipping; use of underground mining where possible; incorporation of best management practices such as work stoppages around sensitive wildlife temporal periods; aircraft flight restrictions; vehicle operations restrictions; and the incorporation of adaptive management protocols based on results from facility-specific and species-specific monitoring programs. Information pertaining to Sabina's WMMPP, as well as other management plans containing wildlife-related mitigation measures, was provided in Volume 10 of the FEIS.

In its response to the 2016 final written submissions, Sabina indicated that it met with the KIA, the GN, and the GNWT to discuss the proposed monitoring programs for wildlife and to revise the WMMPP to improve the quality of wildlife mitigation and monitoring for the Project. On April 11, 2016 Sabina submitted a revised WMMPP which included noted to address concerns expressed by interested parties and included:

- Further details regarding predicted effects for wildlife from the FEIS and associated monitoring objectives;
- Descriptions of monitoring plans with additional mitigation and monitoring commitments; and
- Descriptions of source data used for the plans.

Sabina noted that the updated monitoring plans for caribou incorporated revised monitoring protocols to trigger mitigation and additional monitoring measures to evaluate potential effects on caribou. Among the various additional components within the WMMPP related to caribou, Sabina included: updated calving, post-calving, and collar monitoring measures to include the Beverly caribou herd; a regional monitoring plan initiative using satellite collars to examine any potential ZOI for caribou and a behaviour monitoring program to evaluate caribou responses to potential disturbances such as noise; expanded trigger distances for ground-based monitoring that would consider satellite data reporting delays; expanded trigger threshold to 2.5 km during calving and post-calving periods and 1.5 km for all other periods; additional information pertaining to environment staff training, monitoring locations, methods, and Kitikmeot hiring commitments; amended caribou group size classifications to trigger mitigation; additional details pertaining to the proposed caribou behaviour monitoring program and the development of a behaviour monitoring program for caribou detected at the project site; a stress hormone study to evaluate stress effects to caribou that might be missed through behaviour monitoring; a noise report within the wildlife effects monitoring program detailing total noise and noise levels in the hearing range of caribou; and additional information on government-led herd research support.

Sabina also indicated that the updated WMMPP included amended monitoring plans for grizzly bear,

wolverine, and muskox. Sabina noted that in place of the previously proposed monitoring programs for grizzly bear, wolverine, and muskox, it would employ a new regional program using remote-triggered cameras with the goal to evaluate species distribution and any potential species avoidance of the Project site. Sabina indicated that cameras within this program would be arrayed in treatment, ZOI, and control areas surrounding the Project.

During the 2016 Final Hearing Sabina provided joint submissions with the Government of Nunavut and the Kitikmeot Inuit Association, respectively, containing mutually agreed upon commitments to be incorporated within an updated WMMPP that would be made available for all parties and for the NIRB's review. Within the joint submissions (marked as Exhibits 92 and 96, 2016 Final Hearing) Sabina committed to: revising the WMMPP to ensure that all mitigation and monitoring measures proposed for Bathurst caribou extend also to Beverly caribou; increasing considerations for caribou mitigation and monitoring during the July 26 to August 31 period; providing additional technical specifications around the proposed collar-based regional monitoring programs designed to monitor project-effects on caribou; revising mitigation measures within the WMMPP to include a reduction of project activities should calving or post-calving caribou ranges overlap with the Project based on recent collar and monitoring data; adding a mitigation trigger threshold of four (4) km during calving, post-calving and summer for specific caribou group sizes; further description of project activities that would be reduced during a planned cessation as well as a noise modelling for the associated activities; supporting government cumulative effects and regional monitoring programs for caribou, grizzly bear, wolverine, and/or muskox; avoiding bear dens by one (1) km during construction of the ice road except under exceptional circumstances which would require GN consultation; providing additional mitigation for grizzly bear and muskox; developing further mitigation around the winter ice road; clarifying measures that would be taken should animals deemed project-tolerant in consultation with the GN and relevant authorities. Within the joint submissions Sabina further committed to consulting with relevant parties prior to construction and throughout the life of the Project, as well as updating WMMPP components based on best available science. [329,330]

Caribou

Sabina identified eight (8) caribou herds as having geographic ranges that overlap with the terrestrial wildlife RSA or the marine wildlife RSA (see Section 4.14: Marine Wildlife). Of the identified herds, the Bathurst, Beverly, Dolphin and Union (identified as a species of "Special Concern" in the *Species at Risk Act*), and Ahiak herds formed the basis of Sabina's analysis of caribou. This was noted to be due to their longer duration, extent, and frequency of interactions with the proposed project's RSA as demonstrated through aerial surveys, collar data, motion-triggered camera studies, habitat modelling, and baseline studies (see Section 2.1.1: Biophysical Conditions). Sabina identified that since 2002, the Beverly herd has shifted its calving range to join the Ahiak herd in the western Queen Maude Gulf area and that the two herds were referred to as the Beverly herd in its analysis (as was also done by the Government of Nunavut). It was noted that other herds identified (the Queen Maude Gulf, Lorillard, Wager Bay, and Peary herds) were either represented by proxy in Sabina's assessment or were not included in the assessment based on their lack of spatial-temporal overlap with the proposed project.

Sabina's assessment of potential project-induced effects on caribou resulted in the predicted occurrence

[329] Sabina Gold & Silver Corp. and Government of Nunavut, Joint Submission, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.
[330] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016.

of three (3) potential residual effects: habitat loss, disturbance, and reduction in reproductive productivity. Sabina noted that these effects were primarily predicted for the Beverly caribou herd as there was no overlap discovered between the seasonal ranges of the Bathurst herd and the Project using current and past herd scenarios.

Sabina indicated that high-quality habitat lost due to the development of the Project during the snow-free season would be 5,399 hectares (ha), which would be expected to increase seasonally to 7,355 ha during the winter while winter ice roads were operational. These values represent 0.5% and 0.7% of the available high-quality habitat identified in the wildlife RSA, respectively.

Quantitative noise modelling, as well as qualitative analysis, resulted in the prediction that project noise outside of the Project's PDAs could disturb between 2,153 to 4,504 ha, representing under two percent (2%) of the high-quality habitat identified in the wildlife LSA. Sabina concluded that noise disturbance would be expected to have the largest impact on the caribou population, likely resulting in the avoidance of project areas, and potentially leading to the occupation of lesser quality habitats, causing range shifts and potential reductions in reproductive productivity.

For its assessment of reproductive productivity, Sabina considered seven (7) potential factors thought to contribute to the overall effect: forage availability, annual variation in food quality, disease and parasites, insect harassment, predation, fire in the winter range, harvesting, climate change, and industrial development. The identified factors were selected based on relevant scientific literature and Traditional Knowledge. Sabina concluded that only the Beverly herd would be expected to interact with negative reproductive productivity factors (forage availability and annual variation in food quality) due to the expected overlap between their summer ranges, the Goose Property PDA, and the anticipated ZOI surrounding the PDA.

Sabina estimated the magnitude of all three (3) predicted residual effects would be low, reversible, and of medium term duration (within the life of the Project). It was noted that the exception would be habitat loss within areas of the project footprint, which was predicted to be long term and irreversible. The predicted effects were further predicted to be sporadic in nature and confined spatially to either the project footprint (habitat loss), the LSA (noise disturbance), or potentially the RSA (reduction in reproductive productivity). Sabina defined low magnitude as a slight decline or improvement in VEC condition during the life of the project and within the bounds of natural variation. For a quantifiable effect like habitat loss, Sabina defined low magnitude as a ratio of area lost to the area of the wildlife RSA between 0.1 to 4.9%. Sabina predicted, contingent on the application of mitigation measures, that the significance of residual effects for caribou would be not significant.

Due to the predicted occurrence of residual effects, Sabina conducted a CEA that considered several spatial boundaries based on the post-calving and summer seasonal ranges of the Bathurst herd, the summer and winter ranges of the Beverly herd, and their potential interaction with past, existing, and reasonably foreseeable developments in Nunavut and the NWT. Sabina identified ten possible projects (including four (4) potential future projects) that could contribute cumulatively to the Project's residual effects within the Bathurst herd's CEA boundary, and five (5) possible projects (including three (3) potential future projects) that could contribute cumulatively to the Project's residual effects within the Beverly herd's CEA boundary.

Based on results from quantitative modelling and qualitative assessment, Sabina predicted that the magnitude of all three (3) of the predicted residual cumulative effects on both caribou herds would be

low, with medium-term duration (confined to the life of the Project), with the exception of habitat loss within specific areas of the project footprint. The potential residual cumulative effects were predicted to be sporadic in nature, and confined to local areas (habitat loss and noise disturbance), and potentially the cumulative study area (reduction in reproductive productivity). The potential residual cumulative effects were also predicted to be reversible, with the possible exception of habitat loss within specific areas of the project footprint. Sabina determined, contingent on the application of mitigation measures, that the significance of the potential residual cumulative effects for caribou, and the potential transboundary effects, would be not significant.

Sabina noted that it would be conducting ongoing caribou monitoring programs as outlined in Volume 10 of the FEIS and that it expected to continue to collaborate with the Government of Nunavut – Department of Environment throughout the life of the Project on the collection of caribou satellite collar and motion-triggered camera data and research.

Grizzly Bear

Sabina stated that three (3) bear species were considered as potential species for analysis in its assessment: brown bear, grizzly bear, and polar bear. Sabina noted that although polar bear occur in other parts of Nunavut, they do no interact spatially with the RSA and therefore were scoped out of its assessment. The barren-ground grizzly bear (grizzly bear) was identified as the only sub-species of brown bear to occur within the project area and was selected as the primary species for its assessment. Sabina noted that grizzly bear are listed as a species of "Special Concern" but are not yet listed in the *Species at Risk Act* and are listed as "Sensitive" by the Canadian Endangered Species Conservation Council in the NWT and Nunavut.

Sabina's assessment of potential project-induced effects on grizzly bear resulted in the predicted occurrence of four (4) residual effects: habitat loss, disturbance due to noise, attraction, and reduction in reproductive productivity. Sabina noted that grizzly bear habitat lost due to the proposed development of the Goose Property and MLA PDAs would result in the loss of approximately 0.5% (6,080 ha) of the high-quality grizzly bear habitat identified in the wildlife RSA. Based on noise modelling, Sabina predicted that an area constituting 1.1% of the RSA around the Goose Property PDA would have elevated noise levels that bears may avoid, and therefore lose habitat. Sabina further noted that intermittent aircraft noise was identified as the largest contributor to noise impacts out of all project components considered. Sabina indicated that specific mitigation measures adopted from other Arctic mining projects would be expected to minimize bear attraction; however, there would exist the possibility of interaction should the proposed measures be insufficient. Sabina proposed a bear management program that would trigger a review of waste and camp management programs if bear were observed consistently at the Project site.

Sabina noted that its habitat and noise disturbance models revealed potential effects levels that were not considered to contribute to the reduction of reproductive productivity. Sabina based its conclusion on the limited expected spatial extent of the effects, and the expectation that bear populations would not suffer the effects of reduced energetic intake, stress, or population health if they chose to occupy impacted areas. Sabina noted that its recognition of reduction in reproductive productivity as a residual effect was based on regulatory concern for the health of the species and the precautionary principle.

Sabina predicted that all four (4) of the predicted residual effects would be low in magnitude, reversible, and have medium term duration (confined to the life of the Project), with the exception of habitat loss which would be long term within specific areas of the PDA and irreversible. The predicted residual

effects were further described as being sporadic in nature, and confined within the PDA (habitat loss and attraction), the LSA (noise disturbance) and potentially the RSA (reduction in reproductive productivity). Sabina predicted, contingent on the application of mitigation measures, that the residual effects for grizzly bear would be not significant.

Due to the predicted occurrence of residual effects, Sabina conducted a CEA that considered the movement patterns and home ranges for male and female bears and their potential interaction with past, existing (including the Back River Project), and reasonably foreseeable developments in Nunavut and the NWT. Sabina identified eleven possible projects that could contribute cumulatively to the Project's residual effects within the grizzly bear CEA boundary.

Sabina determined the magnitude of all four (4) residual cumulative effects in the CEA boundary would be low, reversible, with medium term duration (confined to the life of the Project), except for habitat loss which would be long term and irreversible within specific areas of project footprints. The predicted cumulative effects were further defined as being sporadic in nature and confined to the local areas (habitat loss and noise disturbance) and potentially the CEA boundary (reduction in reproductive productivity). Sabina determined, contingent on the application of mitigation measures, that the significance of the potential residual cumulative effects for grizzly bear, and the potential transboundary effects, would be not significant.

Muskoxen

Sabina's assessment of project-induced effects on muskoxen resulted in the predicted occurrence of three (3) residual effects: habitat loss, disturbance due to noise, and reduction in reproductive productivity. Sabina noted that muskox habitat lost due to the proposed development of the Goose Property and MLA PDAs and winter ice road would result in the total loss of approximately 0.8% (9,477 ha) of the high-quality muskox habitat identified within the wildlife RSA. Sabina predicted that an area outside of the Goose Property PDA, totalling approximately 1.1% of the high-quality muskox habitat in the wildlife RSA, would have elevated noise levels that would be expected to have short term (e.g., flight) or long term (e.g., avoidance or habituation) impacts on muskoxen. Sabina noted potential disturbance due to noise was modelled as having the greatest potential to affect muskoxen. However, due to the small spatial extent of predicted noise-disturbed habitat and the expected low population density of muskoxen in the RSA, noise disturbance would only be expected to impact a small number of individual muskox. Sabina noted that reproductive productivity was identified as a potential residual effect following the precautionary principal and based on scientific and regulatory concern regarding the declining rates of muskox reproduction recently observed within the RSA.

Sabina predicted that all three (3) of the residual effects would be low in magnitude, reversible, and of medium term duration (confined to the life of the Project), with the exception of habitat loss which would be long term within specific areas of the PDA and irreversible. The predicted residual effects were further described as being sporadic in nature, and confined within the PDA (habitat loss and attraction), the LSA (noise disturbance) and potentially the RSA (reduction in reproductive productivity). Sabina predicted, contingent on the application of mitigation measures, that the potential residual effects for muskoxen would be not significant.

Due to the predicted occurrence of potential residual effects, Sabina conducted a CEA that considered maximum muskox movement patterns in the region and their potential interaction with past, existing (including the Back River Project), and reasonably foreseeable developments in Nunavut. Sabina identified twelve possible projects that could contribute cumulatively to the Project's residual effects

within the muskox CEA boundary. Sabina determined that the magnitude of all three (3) residual cumulative effects in the CEA boundary would be low, reversible, with medium term duration (confined to the life of the Project), except for habitat loss which would be long term and irreversible within specific areas of project footprints. The predicted cumulative effects were further defined as being sporadic in nature and confined to the local areas (habitat loss and noise disturbance) and potentially the CEA boundary (reduction in reproductive productivity). Sabina determined, contingent on the application of mitigation measures, that the significance of potential residual cumulative and transboundary effects for muskoxen would be not significant.

Wolverine and Furbearers

Sabina indicated that it used wolverines and grey wolves as representative furbearer species for its assessment. Sabina's assessment of project-induced effects on wolverine and furbearers resulted in the predicted occurrence of four (4) potential residual effects on wolverine (habitat loss, disturbance due to noise, attraction, and reduction in reproductive productivity) and two (2) residual effects on grey wolf (habitat loss and disturbance due to noise).

Using a habitat suitability model, Sabina predicted the total high-quality habitat lost for wolverine would be 2,866 ha (0.6% of available habitat in the RSA) and 67 ha (0.6% of available habitat in the RSA) for grey wolf. These values represent high-quality habitat lost due to the development of the MLA and Goose Property PDAs. High-quality wolverine habitat lost or disturbed due to noise outside of the PDAs was predicted as 15,388 ha during the snow-free period, representing approximately 1.1% of the high-quality wolverine habitat available in the wildlife RSA. Sabina noted that grey wolf habitat lost due to noise outside of the PDAs would represent 1.1% of its available high-quality habitat in the wildlife RSA.

Based on knowledge from similar projects in the Nunavut and the NWT, Sabina noted that wolverine, unlike grey wolf, are commonly known to interact and scavenge from project sites and thus attraction was identified as a potential residual effect. Sabina noted that reduction in wolverine reproductive productivity was identified as a potential residual effect so that it could be assessed in its cumulative effects assessment, although it noted that wolverine populations surrounding large operating mines appear to be robust elsewhere in the Arctic. Sabina stated that it would not expect the proposed Project to affect grey wolf reproductive productivity due to the Project's distance from the nearest wolf den and the expectation that it would not impact wolf prey species.

Sabina determined that the magnitude of all of the predicted residual effects for both wolverine and wolves would be low, reversible, and of medium-term duration (confined to the life of the Project) with the exception of habitat loss within specific areas of the project footprint which would be long term and irreversible. The potential effects were further predicted to be sporadic in nature, and confined to within the project footprint (habitat loss and attraction), the LSA (noise disturbance), and potentially the RSA (reduction in reproductive productivity). Sabina determined, contingent on the application of mitigation measures, that the significance of potential residual effects for wolverine and furbearers would be not significant.

Due to the predicted occurrence of residual effects, Sabina conducted species-specific CEAs using estimated maximum movement patterns for wolverine (wildlife RSA) and grey wolf (summer range of prey - Bathurst and Beverly caribou herds) and their potential interaction with past, existing (including the Back River Project), and reasonably foreseeable developments in Nunavut and the NWT. Sabina identified three (3) possible projects that could contribute cumulatively to the Project's residual effects within the wolverine CEA, and 14 that could contribute cumulatively within the grey wolf CEA. Sabina

determined the magnitude of all residual effects on wolverine and furbearers would be low, reversible, with medium-term duration (confined to the life of the Project), with the exception of habitat loss which would be irreversible and long-term within specific project footprints. Sabina further predicted the potential residual cumulative effects to be sporadic in nature and confined to local areas (habitat loss, disturbance, and attraction), and potentially the CEA boundary (reduction in reproductive productivity). Sabina determined, contingent on the application of mitigation measures, that the potential residual cumulative and transboundary effects for wolverine and furbearers would be not significant.

Sabina provided responses to the Board's concerns as expressed in the 2016 Final Hearing Report related to terrestrial wildlife and wildlife habitat, with particular focus on caribou, in Volume 5, Section 5 of the FEIS Addendum. Sabina identified that the purpose of the supplemental content was to address the Board's concerns respecting uncertainty of impacts to caribou and wildlife. The FEIS Addendum section was organized to address several concerns raised by the Board within sections 4.11 (Terrestrial Wildlife and Wildlife Habitat), 6.4 (Cumulative Effects), and 6.7 (Transboundary Effects) of the 2016 Final Hearing Report related to caribou, grizzly bear, muskox, and wolverine and furbearers. The supplemental section included three (3) new appendices which consisted of two (2) expert third-party reviews of the revised Wildlife Mitigation and Monitoring Program Plan (WMMPP), and a note for the record by Sabina in response to the expert third-party reviews of the WMMPP (FEIS Addendum Appendices V5-5I, V5-5J, and V5-5K). Sabina provided Version 7 of the WMMPP within Volume 10 of the FEIS Addendum. As part of its response, Sabina highlighted that none of the additional information presented in the FEIS Addendum affects the conclusions presented in the caribou, grizzly bear, muskox, or wolverine and furbearer FEIS assessments.

Sabina introduced its response to concerns expressed by the Board within the 2016 Final Hearing Report by providing reference to issues identified within the 2016 Final Hearing Report related to the Board's uncertainty with the caribou effects assessment, the proposed adaptive management measures, and caribou sensitivity to any impact that could be realized. Sabina structured the content provided within the supplemental section into five (5) sub-sections, which included an introduction, a caribou herd summary, a background on the FEIS effects assessments for wildlife and caribou, an overview of the WMMPP, and responses to specific wildlife issues identified as uncertainties by the Board within the 2016 Final Hearing Report including:

- Caribou herd vulnerability;
- Mitigation measures should caribou herd experience a range shift;
- Decline of caribou herds;
- Interactions with winter ice roads for caribou;
- Precautionary principle;
- Regulatory capacity;
- Attractiveness of the site for grizzly bears and wolverine; and
- Suitability of mitigation for muskox, grizzly bear, and wolverine.

Introduction

In the introduction, Sabina highlighted the collaborative approach taken to address the Board's concerns and uncertainties, which included a review of the 2016 Final Hearing Report and submissions from parties during the NIRB's Review of the Project; consultation with Kitikmeot communities to obtain

feedback on the 2016 Final Hearing Report and Sabina's approach to caribou management; meetings and consultations with the Kitikmeot Inuit Association (KIA), the Government of Nunavut (GN), the Government of the Northwest Territories (GNWT), focus groups, and community groups on the WMMPP; and commissioning expert third-party reviews of the WMMPP. Sabina further highlighted where it revised the WMMPP between consultations and technical reviews to include measures committed to during the 2016 Final Hearing, as well as measures and details further developed during its supplemental consultation with community groups, focus group, Intervenors, and expert third-party assessments. Sabina noted its opinion that, as a result of the supplemental review and consultation undertaken, the revised WMMPP represents the most conservative and proactive approach to caribou protection of any industrial site in the Arctic and that the new mitigation measures were a significant improvement from their previous plans.[331]

Sabina identified that along with enhanced monitoring measures, it would employ mitigation measures which were described as being part of four (4) broad categories including ongoing mitigation, staged reductions, operational shutdowns (rapid and planned), and other management measures.

Caribou Herd Summary

Sabina provided an overview of the main caribou herds that occur at or near the proposed Project, including the Beverly/Ahiak herd, the Bathurst herd, and the Dolphin and Union herd. Sabina's overview included cursory details regarding potential project interactions, select caribou population trends, and calving/post-calving proximities, and included references to relevant commentary provided by parties throughout the Review of the Project and further details provided within the revised WMMPP. Within the overview, Sabina reiterated that both the Beverly/Ahiak and Bathurst herds were included in the FEIS as Valued Ecosystemic Components (VECs), but that the Project would be located 145 kilometres (km) and 160 km away from the respective core herd calving grounds. Sabina further identified that while the Dolphin and Union herd occurs within the Marine Regional Study Area, it would not overlap with the proposed Project due to the commitment made for undertaking project-related shipping during the open-water period only.

Background of Effects Assessments for Wildlife and Caribou

Sabina reviewed the FEIS effects assessment for eight (8) terrestrial wildlife VECs, and two (2) marine wildlife VECs, including caribou (Bathurst, Beverly/Ahiak, and Dolphin and Union herds), grizzly bear, muskox, furbearers (wolverine), migratory birds (waterbirds and upland birds), raptors, marine mammals (ringed seals), and marine birds. Sabina reiterated that the current status for each wildlife population was described using Traditional Knowledge, regional reports, scientific studies, and baseline studies conducted between 2007 and 2015 for the Project. Sabina highlighted that the FEIS considered six (6) potential direct effects to terrestrial wildlife (habitat loss, disturbance dues to noise, disruption of movement, direct mortality and injury, indirect mortality, and attraction) and one (1) potential indirect effect (reduction in reproductive productivity). Sabina highlighted that for each wildlife VEC, residual effects were predicted to be not-significant based on the species biology, degree of interaction with the Project, and the mitigation, monitoring and adaptive management measures outlined in the WMMPP.

Sabina indicated that its caribou effects assessment included Traditional Knowledge sourced from three (3) Traditional Knowledge studies commissioned in the Back River Area, as well from the NIRB's Public Scoping Meetings Summary Report and focus group sessions with hunters from the Kitikmeot

[331] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 179-181, lines 10-26, 1-26, and 1-10.

communities. Sabina highlighted findings used in its effects assessment derived from Traditional Knowledge including traditional Bathurst caribou historical calving locations, as well as seasonal movement patterns, river/lake crossings, and traditional activity areas. Sabina reiterated that its effects assessment for caribou described past, current, and potential future effects on caribou and incorporated information from the Traditional Knowledge it sourced, along with collar data, and other studies using aerial survey, remote cameras, and habitat mapping to evaluate potential effects of the Project on caribou. Sabina highlighted how its assessment of potential direct and indirect effects to caribou was adapted to potential caribou-specific interactions. For example, habitat loss was evaluated as the loss of habitat compared to the size of seasonal ranges where caribou may overlap the proposed Project site, compared to the total herd range, and disruption of movement considered the location of the Project compared to migration routes identified from Traditional Knowledge and satellite collars, and the traffic level on roads compared to threshold values that can result in a barrier effect to caribou. Sabina noted that reduction in reproductive productivity was evaluated through a literature review of productivity and energetics studies on caribou.

Sabina reiterated its recognition that land use by caribou can change over time, and that it addressed potential changes in land use and effects uncertainty through its assessment in five (5) ways within the FEIS, including:

- The use of a Potential Development Area (PDA) that would be approximately seven (7) times larger than the actual proposed PDA which would overestimate habitat loss;
- The evaluation of three (3) potential calving range shift scenarios for the Bathurst caribou herd;
- The evaluation of potential effects of disturbance due to noise, dust, and aircraft overflights on caribou by evaluating a zone of influence (ZOI) using a four (4) km and worst-case 14 km buffer, compared to seasonal and annual ranges;
- The assessment of cumulative effects for both Bathurst and Beverly/Ahiak herds; and
- The inclusion of monitoring and mitigation measures within the FEIS WMMPP for the Project which anticipate and react to shifts in the distribution of caribou calving and post-calving ranges, which were updated during and following the 2016 Final Hearing.

Sabina reiterated conclusions drawn from its FEIS effects assessment for caribou, and highlighted that in the status-quo scenario for the Bathurst caribou herd range, there would be no effects, and non-significant effects on the herd in the two (2) other scenarios considered, the potential effects of both ZOI scenarios were evaluated as not-significant for caribou, and that its cumulative effects assessment estimated that past, present, and reasonably foreseeable future projects would remove less than 0.1% of the annual range of either caribou herd. As a result, potential effects were rated as not-significant.

Overview of the WMMPP

As part of its overview of the WMMPP and its development, Sabina provided details on how it collaborated with stakeholders, regulatory authorities, and the public leading up to and during the 2016 Final Hearing, as well as following the Hearing. Sabina highlighted where the WMMPP was revised during the various NIRB Review stages to address concerns expressed by parties, including the KIA, GN, and the GNWT, regarding uncertainty in the effectiveness of proposed mitigation and monitoring measures. Sabina also illustrated consultations held following the 2016 Final Hearing with Kitikmeot communities, government and Inuit parties, stakeholders, and expert reviewers, which resulted in the development and submission of WMMPP Version 7 within the FEIS Addendum. Sabina highlighted where it incorporated commitments made during the 2016 Final Hearing through joint submissions with

both the GN and the KIA (provided as tables).

Sabina discussed proposed monitoring measures within the revised WMMPP, noting where comments from the KIA, GN, and GNWT were addressed, including the commitment to staff wildlife monitors year-round to monitor for caribou, with collar data to be used as supplemental information collected by wildlife monitors. Sabina noted that detailed methods of its monitoring programs would be finalized during permitting, in consultation with the KIA, GN, and the GNWT, and that results of the programs would be reported in its annual Wildlife Effect Monitoring Program where Sabina, the NIRB, KIA, GN, and the GNWT would be able to evaluate project effects on caribou. Sabina discussed the following proposed monitoring measures, found in Version 7 of the WMMPP, to be undertaken as part of the Project to trigger mitigation measures such as staged reductions of activities, operational shutdowns, and adaptive management measures:

- Active caribou monitoring – year-round monitoring by trained wildlife monitors for caribou, grizzly bear, and muskox through mounted high-powered closed-circuit television (CCTV) cameras (preferred), observation blinds (secondary), and/or vehicle-based observation from elevated terrain on site road (tertiary);
- Caribou range mapping – seasonal range mapping for the Bathurst and Beverly/Ahiak herds to identify shifts and potential overlaps;
- Near real-time collar monitoring – caribou collar monitoring using data provided by the GN and the GNWT;
- Incidental observations – observations of caribou by all project personnel;
- Zone of influence monitoring – comparison of satellite collar data to historical data throughout the life of the Project to study potential avoidance of the project site by caribou;
- Behaviour monitoring – conducted by wildlife monitors to determine how caribou respond to stimuli at varying distances from the mine site;
- Stress hormone study – analysis of stress hormones in fecal pellets to determine whether caribou near the Project have higher stress levels;
- Noise monitoring – conducted to determine what noise levels are produced by the Project;
- Dust monitoring – conducted to determine how much dust is deposited on the landscape and how much additional dust is deposited due to project activities;
- On-site motion-triggered cameras – used to monitor wildlife interactions with specific project components and features;
- Collaborative herd-scale monitoring – collaborative monitoring with the GN and GNWT to monitor the regional population of caribou;
- Regional camera monitoring program – motion-triggered cameras to monitor wildlife, including caribou, grizzly bear, wolverine, and muskox, in select areas, including important habitat sites and around specific infrastructure at increasing distances;
- Over-the-horizon monitoring – use of CCTV cameras to monitor at greater distances, with the potential for other methods to monitor caribou at greater distances;
- Human activity monitoring – incidental observations of harvesters using the winter ice road and the area surrounding the Project would be recorded; and

- Footprint monitoring – monitoring of the constructed footprint of the Project.

Sabina classified the proposed mitigation measures in the WMMPP into the following four (4) categories: ongoing mitigation, staged reductions, operational shutdowns, and other management measures. The levels of protection for caribou were further organized from Level 1 to Level 6: Level 1 – Normal Operations, Level 2 – Site Notification, Level 3 – Site Alert, Level 4 – Staged Reduction in Project Activities, Level 5 – Rapid Operational Shutdown, and Level 6 – Planned Operational Shutdown.

Sabina identified ongoing mitigation measures as activities that would be conducted at all times, regardless of whether caribou, as well as other types of wildlife, are on-site. Sabina noted that general mitigation measures included in the FEIS Addendum WMMP remained largely unchanged from the FEIS WMMPP as the measures are typically industry-standard best management practices or are legislated by international, federal, or territorial bodies. However, Sabina noted that the FEIS Addendum WMMPP organized all measures together for easier readability. Sabina highlighted and discussed several proposed mitigation measures included in the WMMPP, such as wildlife interaction policies, employee education programs, noise and dust abatement measures, project design and operational measures, fuel and hazardous material management measures, and road operations measures. Sabina also highlighted where other project management plans provided as part of the FEIS include environmental and wildlife protection measures.

Sabina highlighted that the staged reduction in project activities were intended to reduce potential effects to caribou and other terrestrial wildlife once observed in the vicinity of the project site, and that management measures in the WMMPP were directed towards activities known to cause reactions in wildlife, particularly caribou, including blasting, heavy mobile equipment operation, light vehicle operation, and helicopter and aircraft operation. Sabina discussed various revisions made to the WMMPP to address concerns expressed by parties such as the KIA, GN, and GNWT leading up to, and following, the 2016 Final Hearing which included the following:

- Updates to the applicability of the WMMPP to all caribou, regardless of the herd;
- Cessation of blasting if 30 or more caribou are observed within four (4) km of the project site year-round;
- Delaying blasting if groups of less than 30 caribou are observed within 500 metres (m) of blasting sites until animals have moved off;
- Delaying blasting should large groups (over 250 caribou) be observed within the four (4) km trigger distance, with resumption only once the group moves beyond the four (4) km threshold;
- Suspending heavy equipment operations during calving, post-calving, and early summer if groups of 30 or more caribou are observed within one (1) km of the specified mine operations, and employing a trigger distance of 0.5 km during the remainder of the year;
- Reducing light vehicle speeds should a caribou, or large mammal, be observed within 500 m of any road and issuing alerts;
- Light vehicle movement cessation protocols on all-season roads should caribou be observed within 50 m with associated alert protocols;
- Light vehicle movement cessation protocols should caribou be observed on the all-season roads; and
- Helicopter and fixed-wing aircraft caribou avoidance measures, with increasing protection

during sensitive seasons such as calving, post-calving, and early summer.

Sabina identified that rapid and planned operational shutdowns were management actions included in the WMMPP through discussions with the KIA, GN, and GNWT. Sabina noted that rapid operational shutdowns would be triggered if large groups of caribou are observed within four (4) km of the project site during calving and post-calving seasons, and planned operational shutdowns would be triggered if collar data indicated that a caribou herd shifted its calving or post-calving range to permanently overlap the Project. Mitigation measures that would be undertaken during rapid or planned operational shutdowns include:

- Daily communication with regulators;
- Cessation of open pit and surface blasting;
- Cessation of open pit activities;
- Cessation surface heavy equipment use;
- Cessation of helicopter landings and take-offs;
- Reduction or cessation of fixed-wing aircraft use;
- Reduction of light vehicle use on surface;
- Continuation of select or cessation of underground activities;
- Reduction in on-site workforce (planned); and
- Reduction in mill operations (planned).

Sabina described other management measures as measures that were introduced within the WMMPP to capture special cases, and discussed mitigation measures should caribou interact with the Tailings Storage Facility (TSF), measures to manage project-tolerant animals, and measures to manage caribou should they occupy the runway. Sabina highlighted throughout its discussion of mitigation measures where input received from parties, specifically the KIA, GN, and the GNWT, during the NIRB Review process and through consultation, was incorporated into the development of specific plans/programs, methodologies, and mitigation protocols.

Sabina discussed the predicted effectiveness of its proposed WMMPP and highlighted various measures incorporated into its proposed operations that relate to those employed through other projects/operations in Nunavut, the Northwest Territories, British Columbia, and the Yukon. Sabina referenced similar measures employed at the Tibbit to Contwoyto Lake Winter Road (Northwest Territories/Nunavut), the Doris North Project (Nunavut), the Ekati Diamond Mine (Northwest Territories), noting that its proposed mitigation measures are largely standard industry best practices and have been proven effective over time. Sabina further noted that its proposed aircraft avoidance and operational shutdown protocols incorporate the Mobile Caribou Conservation Measures for the Kivalliq Region, Nunavut.

Specific Topics Identified by the Board in the 2016 Final Report

Herd Vulnerability

In response to the Board's concern expressed in the 2016 Final Hearing Report regarding whether Sabina could prevent or limit impacts to caribou given the present population health of the herd and

those that could be experienced during the life of the Project, Sabina noted that it added a section to the WMMPP related to caribou population health and the potential for future change, as well as a section describing how the WMMPP would be updated throughout the life of the Project. Sabina highlighted that it adopted the Beverly and Qamanirjuaq Caribou Management Plan 2013-2022 approach for its mitigation activities, and noted that the "Herd Vulnerability and the Sabina Adaptive Management Approach" (WMMPP V7, Section 7.1.3) section of the WMMPP describes its methodology. Sabina indicated that should herd vulnerability increase, mitigation, management, and monitoring measures would also increase. Sabina further clarified that herd vulnerability would be determined by appropriate government agencies and applied by Sabina accordingly.

Mitigation measures should a caribou experience a range shift

In response to the Board's concerns expressed in the 2016 Final Hearing Report regarding the potential for the Project to overlap with caribou herd ranges should they shift in the future, and the effectiveness of management measures should such a shift occur, Sabina outlined and described several considerations it incorporated into the revised WMMPP. Sabina discussed how seasonal caribou ranges were estimated using 20 years of satellite collar data and were agreed upon by the GN and GNWT; how future potential calving range shifts were assessed through the consideration of three (3) different calving range scenarios for the Bathurst herd; and the incorporation of rapid planned operational shutdowns into the WMMPP. Sabina also highlighted where it incorporated commitments made to the KIA and the GN during the 2016 Final Hearing within the WMMPP related to caribou range shifts and reduction in project activities.

Decline in caribou herds

Sabina acknowledged the opinions expressed by various participants during the 2016 Final Hearing that mining has had a deleterious effect on barren-ground caribou populations, particularly the Bathurst herd. In response, Sabina reiterated that the Project would not have any interaction with the Bathurst herd, and that all past and existing mines occupy only 0.018% of the Bathurst herd's range. Sabina further highlighted that studies and monitoring have not shown a clear link between mining activities and the decline of caribou herds, nor have they shown that mining activities would limit herd recovery. Sabina also discussed the GNWT's statement made during 2016 Final Hearing which suggested that herd decline could be the result of natural fluctuation and over-harvesting.

Interactions with winter ice roads for caribou

In response to the Board's concerns related to the proposed mitigation measures for caribou around the proposed winter ice road, Sabina discussed concerns raised by agencies during the 2016 Final Hearing related to the potential for caribou movement to be impeded by the road, and concerns regarding the potential use of the winter ice road by harvesters.

Sabina highlighted the proposed operational period for the winter ice road, and noted that it would be located in the north-western extent of the winter range of the Beverly/Ahiak herd, and that during spring migration approximately 1.5% of the herd migrates from the west across the road toward their calving grounds in the Queen Maud Gulf Migratory Bird Sanctuary. Sabina reiterated mitigation measures contained within the WMMP related to the winter ice road, including limiting the height and slope of snowbanks and reduced speed and stoppage protocols, and noted that the expected traffic rate on the road (2-3 vehicles/hour) would be below the reported threshold for caribou avoidance (20-30 vehicles/hour). Sabina further identified additional measures it incorporated into the revised WMMPP following discussions with the KIA and the GN through the 2016 Final Hearing, including specific seasonal closure protocols to limit interaction with migration, ice road closure protocols based on collar

data and ground-based monitoring results, and greater movement cessation thresholds should operations extend beyond April 15.

Sabina discussed its proposed measures for managing use of the winter ice road by harvesters and noted that the road would be located approximately 375 km from the nearest populated centre, in a low caribou density area, and that other herds would be closer to the populated centres for hunting. Sabina highlighted measures contained within the WMMPP for human activity monitoring and reporting - some developed during and following the 2016 Final Hearing - which include the commitment to develop more comprehensive monitoring plans should more than five (5) people be observed on the winter ice road per year; personnel firearm restrictions; harvesting monitoring protocols; restrictions to public access; commitments to liaise with relevant hunters and trappers organization for enhanced management measures if triggered; and restrictions under the *Nunavut Wildlife Act*.

Sabina noted that with the proposed measures in place, its commitments to work with other parties to monitoring and develop additional mitigation as needed, and given the distance between the nearest community and the beginning of the winter ice road, potential effects on caribou populations would be effectively mitigated.

Precautionary Principle

Sabina acknowledged the Board's consideration of the Precautionary Principle within the 2016 Final Hearing Report, and noted that it has worked with government agencies, including the KIA, GN, and the GNWT, throughout the NIRB Review process on enhanced caribou protection measures and is of the view that the precautionary principle has been properly considered in accordance with the Environmental Impact Statement Guidelines. Sabina highlighted excerpts from the Back River Environmental Impact Statement (EIS) Guidelines related to the Precautionary Principle, the requirements of proponents to employ the Principle throughout the development of an EIS, and identified and discussed three (3) ways it applied the Principle for the protection of caribou including:

- The use of worst-case-scenarios or a range of potential effects in the effects assessment for all wildlife VECs where there was any uncertainty in scientific evidence;
- The inclusion of the Bathurst caribou herd in the FEIS cumulative effects assessment, although it could have been excluded from the assessment based on its lack of interaction with the project area currently and over the last 20 years; and
- Updates made to the WMMPP through consultation with the KIA, GN, GNWT and Kitikmeot Communities following the 2016 Final Hearing.

Sabina discussed the purpose and expected effectiveness of the WMMPP and noted that the WMMPP was developed in collaboration for the purpose of mitigating any unacceptable effects to caribou through the application of the Precautionary Principle, and that it has committed to ongoing dialogue with the KIA, GN, and GNWT to review and update the WMMPP as needed.

Regulatory Capacity

In response to the Board's concerns noted within the 2016 Final Hearing Report regarding regulatory capacity and the number of ongoing initiatives for caribou management, Sabina noted that no regulators, including the KIA, have identified any issues with respect to capacity or fiscal restraint that could affect their regulatory oversight of the Project with respect to the caribou management. Sabina suggested that to address the Board's concerns regarding government monitoring, it could develop

terms and conditions through a Project Certificate, pursuant to the *Nunavut Agreement*, to fully address its concerns. Sabina referenced and discussed sections of the *Nunavut Agreement* that allow the Board to establish conditions assigning responsibilities for the Proponent, the Board, and the government; grant the NIRB the ability to require regulatory agencies to supply the NIRB with information as part of project monitoring; and legally require responsible government agencies and departments to fulfill their responsibilities for monitoring and data collection.

Attractiveness of the site for grizzly bears and wolverine

In response to the Board's concerns that mitigation measures may not limit grizzly bear and wolverine site attraction, Sabina reviewed management measures proposed within the FEIS WMMPP that were included to limit the potential for wildlife site attraction, including the proper management of wastes and specific project infrastructure as well as design considerations. Sabina highlighted that measures to reduce site attraction are well understood, are successful when followed, and discussed the effectiveness of similar mitigation measures on other northern projects such as the Diavik Diamond Mine Project (Northwest Territories), the Ekati Diamond Mine Project (Northwest Territories), and the Doris North Project (Nunavut).

Sabina noted that few comments were received from interested parties regarding the proposed management measures for site attraction, except that the measures were originally distributed throughout the FEIS WMMPP and not clearly organized. To address this, Sabina amalgamated all mitigation and management related to the attraction of grizzly bear and wolverine within Section 9.1.7 of the revised WMMPP. Sabina further discussed the measures contained within the WMMPP related to wildlife site attraction including: design mitigation measures; wildlife attractant management; general measures to reduce human-wildlife interactions; response protocols for grizzly bear and wolverine observations; and protocols for managing problem wildlife.

Suitability of mitigation for muskox, grizzly bear and wolverine

In response to the Board's concerns that the proposed mitigation and management measures included in the WMMPP may not be protective of muskox, grizzly bear, and wolverine, Sabina provided an outline of updates made to the WMMPP during the NIRB's Review process, including additional measures incorporated during and following the 2016 Final Hearing through consultation with the KIA and the GN. Sabina highlighted various measures contained within the WMMPP, as well as changes made to the WMMPP throughout the Review of the Project, including:

- Extending the blasting cessation trigger for muskox and grizzly bear from 500 m to 1 km;
- Extending the speed reduction trigger for vehicles and heavy equipment on roads for muskox and grizzly bear from 250 m to 500 m;
- Operational measures to reduce traffic frequency on the winter ice road, traffic management, further speed reductions based on large aggregations of terrestrial wildlife, and stoppage protocols during wildlife road crossings;
- Helicopter and fixed-wing aircraft avoidance measures; and
- Winter ice road construction protocols such as avoiding areas with higher chance of supporting grizzly bear denning, conducting pre-construction surveys as required, bear den location marking and avoiding bear dens identified through pre-construction surveys by 1 km, and consulting with the GN in circumstances when logistics require construction within the 1 km den boundary.

Sabina stated in its conclusion that through the updates to the WMMPP, it had produced a set of management actions that would be protective of muskox, grizzly bear, and wolverine, and would meet or exceed those at other mines in the Canadian Arctic.

Sabina indicated that the supplemental content provided within Section 5.5 of the FEIS Addendum was also meant to address the Board's concerns related to the potential for project-induced cumulative effects (Section 6.4 of the 2016 Final Hearing Report) on caribou, grizzly bear, wolverine, and muskox, and the potential for transboundary effects on caribou and terrestrial wildlife (Section 6.7 of the 2016 Final Hearing Report). Sabina reiterated that the revised WMMPP would be protective of caribou and other terrestrial wildlife, and would ensure that cumulative and transboundary effects are minimized. Sabina further reiterated its commitment to working with the KIA, GN, the GNWT, and other interested parties to refine and update the WMMPP throughout the Project.

As part of Volume 5 of the FEIS Addendum, Sabina provided two (2) independent third-party technical reviews of the WMMPP as appendices (FEIS Addendum Appendices V5-5I and V5-5J). The reviews analyzed and assessed Sabina's proposed terrestrial and marine wildlife mitigation, monitoring, and adaptive management measures and provided commentary on the effectiveness of the WMMPP and its ability to manage uncertainty in future habitat use by caribou, its ability to address mobile protection measure objectives, and its breadth in relation to other plans in Nunavut and the Northwest Territories. The reviews also provided feedback to Sabina to improve select points identified in the respective assessments. Feedback from the reviews included statements that Sabina demonstrated a willingness to plan and operate a project with care and precaution for caribou populations regardless of their potential sensitivity to the Project and that Sabina's approach to mitigation and monitoring exceeds generally accepted mitigation principles in that it does not rely on the presence or prediction of adverse project effects to trigger protective mitigation measures. Other comments noted that Sabina's WMMPP meets or exceeds that of other northern mines, and that overall, the WMMPP is comprehensive and has sufficient details on the objectives and methods for testing impact predictions, evaluating the effectiveness of mitigation, and providing feedback and triggers for the adaptive management of mining operations to protect people, wildlife, and wildlife habitat. In response to the comments and recommendations presented in the respective reviews, Sabina provided an additional appendix (FEIS Addendum Appendix V5-5K) that highlighted changes made to the WMMPP to address the recommendations made, or further rationale on topics identified by the reviewers.

Prior to, and again during the supplemental Final Hearing, Sabina submitted Version 8 of the WMMPP to the NIRB and parties, which included revisions to address comments received by the NIRB during the technical review of the FEIS Addendum and during the NIRB's Technical Meeting held via teleconference.[332] Revisions included as part of Version 8 of the WMMPP consisted of updated and clarified mitigation, monitoring, and/or adaptive management measures for terrestrial and marine wildlife including:

- Winter ice road operations, monitoring, and adaptive management protocols;
- Helicopter operations and aircraft monitoring measures;
- Clarified terminology and definitions;
- ZOI monitoring and adaptive management protocols;
- Transportation and marine shipping considerations;

[332] Sabina Gold & Silver Corp., Exhibit 17, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.

- Species at risk identification and management;
- Vegetation monitoring details;
- Raptor avoidance protocols and consultation procedures;
- Updates to operational shutdown protocols and collaboration measures;
- Camera monitoring design;
- Water monitoring and waterbird exclusion protocols;
- Marine bird and waterbird monitoring protocols and collaboration commitments; and
- Details regarding the establishment and function of a Caribou Technical Advisory Group.

During the supplemental Final Hearing, Sabina provided further details during its presentation on revisions made to the WMMPP since the 2016 Final Hearing and discussed how input was considered and incorporated into the revised WMMPP.[333]

During the supplemental Final Hearing, Sabina highlighted that:

> *The goal of the wildlife mitigation and monitoring plan is to have no impact on caribou herds from the Project. That's a clear, concise statement. That is the objective. There may be impacts on individuals, but there will be no impact on the herd itself.*[334]

Sabina committed to revise Version 8 of the WMMPP with additional details and measures related to wildlife mitigation and monitoring including the following:

- Removal of the discussions of herd vulnerability related to planned operational shutdowns;
- Reduction of the trigger for rapid operational shutdowns from 250 caribou within four (4) km of the Project (4.1 caribou/square kilometre [km^2]) to a density of two (2) caribou/km^2 within four (4) km of the Project during calving and post-calving periods;
- Reduction of the group size to trigger staged reductions in project activities from greater than or equal to 30 animals to greater than or equal to 25 animals;
- Commitments to study caribou group sizes during summer and fall seasons during the first three (3) years of the Project to update triggers for staged reduction protocols in the WMMPP in collaboration with the Caribou Technical Advisory Group;
- Reduction of the group size trigger for staged reductions during calving from greater than or equal to 30 caribou to greater than or equal to 10 breeding female caribou;
- Increasing the setback distance for cessation of blasting from four (4) km to five (5) km during calving;
- Increasing the trigger distance for stoppage of heavy mobile equipment during summer from 500 m to 750 m, excluding equipment that is obscured from view by caribou;
- Producing a winter road Schedule each year of winter ice road operations; and

[333] Sabina Gold & Silver Corp., Exhibit 19, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[334] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 181-182, lines 24-26 and 1-3.

- Additional commitments to review various thresholds, monitoring, and mitigation measures with the Caribou Technical Advisory Group.[335]

Sabina also submitted additional documents which contained suggested revised, updated, and/or new terms and conditions and/or commitments developed in collaboration with parties which included measures for wildlife protection.[336,337]

4.11.2 Views and Concerns of Interested Parties

Within their respective 2016 final written submissions, the Kitikmeot Inuit Association (KIA), Government of Nunavut (GN), Government of the Northwest Territories (GNWT), North Slave Métis Alliance (NSMA), and the Yellowknives Dene First Nation (YKDFN) expressed concerns regarding the wildlife mitigation measures included within Sabina's proposed Wildlife Mitigation and Monitoring Plan (WMMPP)[338], as well as concerns relating to the appropriateness and scientific rationale behind Sabina's triggers for mitigation. Parties noted particular concern with mitigation trigger thresholds proposed within the FEIS, stating that the scientific rationale behind the use of various mitigation distance thresholds, zone of influence (ZOI) estimations, and wildlife group size determinations remained unjustified and required modification given the presence of wildlife (caribou, muskox, bear, and wolverine) in the area, the state of caribou herds that would interact with the Project, and the potential for future range shifts within the Bathurst and Beverly caribou herds. The GN also noted concerns with the lack of clarity regarding grizzly bear and wolverine management and recommended that additional measures be included in the WMMPP to develop buffers around dens encountered during construction activities, as well as measures to improve public safety and minimize risk of bear mortalities. In its 2016 final written submission and during the 2016 Final Hearing the GN also stated that Sabina should consult with relevant authorities for the development of strict criteria and procedures for governing the deterrence of wildlife from blast zones and the relaxation of mitigation measures for animals deemed project-tolerant.[339]

In its response to the 2016 final written submissions, Sabina indicated that trigger distances during calving and post-calving periods, and during the remainder of the year, were based on the sensitivity of caribou to disturbance and were developed to be consistent with mitigation measures applied at the Meadowbank and Doris North mining projects. In response to comments received Sabina noted that trigger distances were revised within the updated WMMPP to extend mitigation trigger thresholds to 2.5 kilometres (km) during the calving and post-calving periods, and 1.5 km outside of calving and post-calving periods. Sabina also noted that the revised WMMPP included: updated protocols to liaise with the GN should immediate mitigative action for bears be required; updated measures to avoid dens detected during pre-construction surveys; and management actions to increase the safety of project personnel around wildlife, including bear and wolverine. Further, Sabina committed to including additional information in the WMMPP on the circumstances and methods used to determine if an animal became habituated to the Project and if mitigation actions would need to be modified. Sabina

[335] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[336] Sabina Gold & Silver Corp., Exhibit 45, NIRB supplemental Final Hearing File No. 12MN036, June 1, 2017.
[337] Sabina Gold & Silver Corp., Exhibit 106, NIRB supplemental Final Hearing File No. 12MN036, June 3, 2017.
[338] Throughout the commenting periods and at the 2016 Final Hearing, select parties referred to the Wildlife Mitigation and Monitoring Program Plan as the Wildlife Mitigation and Monitoring Plan.
[339] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 417-418, lines 18-26 and 1.

also noted that within the revised WMMPP, caribou group sizes were re-classified, technical details were provided, and that wildlife observation programs and methodologies were further described to address parties' respective concerns (see Section 4.11.1: Views of the Proponent).

During the 2016 Final Hearing, the KIA expressed concerns regarding the mitigation distances based on noise-level thresholds that would be employed to protect caribou from blast noise disturbances. The KIA noted that Sabina based its threshold distances around blasting on the highest noise level available in referenced literature and suggested that a more conservative approach be considered that would use a noise threshold between 85 and 96 decibels (dB) to establish a required buffer distance around blasting activities. In response, Sabina indicated that although its current effects assessment included the 96 dB range, it would amend the WMMPP to include this decibel rating threshold.[340,341] In response to a question from the GN regarding the sound effect of the original 108 dB threshold rating, Sabina added for reference that 130 dB of instantaneous sound is approximately the sound of a hand clapping loudly, and that instantaneous, short term, and continuous noise would be monitored and mitigated through its WMMPP.[342] Similarly, in response to a question from the YKDFN regarding the number of noise events that would be expected to reach top noise limits, Sabina stated noise reaching the 108 dB level would only be expected to occur roughly once per day during scheduled blasting events. [343]

During the 2016 Final Hearing the GN noted that it had outstanding concerns related to mitigation measures included in Sabina's revised WMMPP and recommended that Sabina strengthen mitigation measures for caribou in all seasons and for all herds in the project area, increase activity and infrastructure setback distances from bear dens to 1 km for dens that are occupied or may be occupied during the denning season, and collaborate consistently with the GN in its planning processes.[344] The GN further requested that Sabina schedule project construction outside of the summer period between July 26 and August 31 to avoid disturbance to wildlife and to minimize interaction with caribou. In response to a question from the Board staff, the GN added that this recommendation was made to avoid project interaction with wildlife during periods identified as having the greatest occurrence of caribou through the year, and also the largest amount of outdoor disturbance, as identified within the FEIS.[345]

In response to the GN's concerns, Sabina reiterated its response to the 2016 final written submissions, noting that it incorporated recommendations specifically related the grizzly bear mitigation within the revised WMMPP.[346] Sabina also stated that it would be essential to the feasibility of the Project to conduct construction activities between July 26 and August 31 as these periods correspond directly with

[340] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 244, lines 12-23.
[341] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[342] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 270-271, lines 6-26 and 1-3.
[343] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 316-317, lines 23-26 and 1.
[344] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 413-415.
[345] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 430-431, lines 13-26 and 1-16.
[346] C. Kowbel, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 427, lines 9-12.

the short summer time-frame critical for its multi-year construction plan. Sabina indicated that construction outside this window could pose undue safety risks to personnel, increase economic liability, and logistically would cause significant challenges with regards to installation, shipping, as well as permitting. Sabina further added that it felt that the GN's recommendation to cease construction activities during the proposed window had no reasonable basis from a wildlife protection standpoint, as the revised WMMPP included protection measures for caribou year-round, and during periods of heightened sensitivity such as calving and post-calving. Sabina further noted that the revised WMMPP included comprehensive mitigation and monitoring measures and was supplemented with stakeholder recommendations, Traditional Knowledge, and industry best-practices consistent with relevant supporting literature.[347]

A Community Representative from Gjoa Haven noted during the 2016 Final Hearing that:

> *You have to be very careful and aware that the grizzlies don't get at your construction material the supplies that your ships have brought in. Your supplies may be -- may be disturbed by some of the grizzlies that will probably arrive in that area unexpectedly.* [348]

In response to this statement and others related to wildlife attraction, Sabina indicated that site attraction would be mitigated through site hardening to exclude animals from buildings, waste storage and handling measures to properly manage wastes as to not attract wildlife, and monitoring measures to ensure that mitigation was effective. Sabina added that its hazardous chemical management and handling plans are also designed protect wildlife from chemical exposure and associated impacts. [349,350]

The GN commented during the 2016 Final Hearing that the measures to implement site shutdowns should calving and post-calving caribou overlap with the project area were removed from the revised WMMPP and requested clarification from Sabina as to why these measures were omitted from the updated plan.[351] In response, Sabina stated that there were inconsistencies in language within the original WMMPP between the concept of "staged reduction of activities" and the term "shutdown", therefore it opted to incorporate more specific language to describe what types of activities would be stopped if calving or post-calving caribou overlapped with the project area. In response to a request from the GN and the NSMA to further elaborate on what activities would cease operation should overlap occur, Sabina explained that should caribou approach the project area, the staged reduction of further-reaching project activities would first occur, followed by the temporary cessation of activities in closer proximity to the site should caribou continue to approach the project area. [352] Sabina clarified, however, that while many activities would temporarily cease operating, indoor activities such as maintenance and operation of the mill, generators, and pumps would continue as it would not be operationally feasible to completely close the entire mine site, and these activities would have limited

[347] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 523-527.
[348] B. Putuguq, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 829, lines 2-7.
[349] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 347-348, lines 14-26 and 1-17.
[350] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 830, lines 16-25.
[351] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 260, lines 1-9.
[352] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 260-261, lines 10-26 and 1-9.

effect on disturbing caribou.'[353] In their closing remarks the KIA agreed with Sabina, noting that it did not see the need for a complete cessation of all activities during the summer season as it would threaten the feasibility of the Project.[354]

During the 2016 Final Hearing, the KIA noted that within Sabina's revised WMMPP no contingency plan was included to mitigate caribou interaction with tailings water should water quality be below expected quality levels. In response, Sabina indicated that although no effects would be expected on wildlife based on toxicology reports included within the FEIS, there would be a camera monitoring program in place around the tailing impoundment area to monitor wildlife interaction with the facility. Sabina added that this would complement adaptive management protocols should they be required and that it would be open to developing a commitment on the management of caribou in this regard through consultation with the KIA.[355]

The GN further noted during the 2016 Final Hearing that within the revised WMMPP there were no provisions for the suspension of aircraft flights when caribou are present on the runway, and questioned Sabina as to whether it would be open to including measures to allow for the temporary suspension of air traffic during periods when distance buffers would not be feasible to mitigate potential impacts on caribou. In response, Sabina indicated that its revised WMMPP contained mitigation measures for both fixed-wing aircrafts and helicopters, as well as protection measures should caribou be located on the airstrip. However, Sabina noted that currently there are no plans to manage landings and takeoffs as these flights would be essential to supply and staff the Project.[356] In response to a request from the YKDFN to clarify what mitigation would be in place for fixed-wing aircrafts, Sabina noted that fixed-wing aircrafts would be required to stay above 610 metres (m) year-round except during landing and takeoffs.[357]

During the 2016 Final Hearing Sabina submitted, in conjunction with the GN and the KIA, respective joint submissions (Exhibits 96 and 92) which included mutually agreed upon commitments to address the KIA's, the GN's, and other parties' wildlife-related concerns as discussed through the 2016 final written submissions and throughout the 2016 Final Hearing (see Section 4.11.1: Views of the Proponent).[358,359]

Within their respective 2016 final written submissions, the KIA, the GN, and the GNWT expressed concerns regarding Sabina's proposed wildlife monitoring program framework and its focus on monitoring cumulative effects in the Kitikmeot region through government-led initiatives in place of project-specific and focused species-based programs. The KIA and the GN noted that in response to

[353] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 303, lines 4-11.
[354] P. Emingak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1345, lines 4-7.
[355] G. Sharam, Sabina, Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 248-249, lines 2-25 and 1-20.
[356] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 268-269, lines 8-26 and 1-19.
[357] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 309, lines 5-15.
[358] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[359] Sabina Gold & Silver Corp. and Government of Nunavut, Joint Submission, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.

requests made for additional details on back-up wildlife monitoring plans during the information request phase, Sabina reiterated its commitment to contribute funding to government-led caribou and grizzly bear monitoring programs as back-up monitoring initiatives, and suggested it would monitor wolverine reproductive success through den surveys in the Project regional study area. The KIA noted that no back-up monitoring plans were provided for muskoxen. Parties noted concerns with the lack of clarity provided in Sabina's existing monitoring programs, in addition to how these programs and data would be used to inform project impacts and adaptive management plans at the proposed Back River Project. Within Sabina's joint submission with the GN (Exhibit 96, 2016 Final Hearing), Sabina committed to contribute to GN/GNWT cumulative effects and regional monitoring programs for caribou, grizzly bear, wolverine, and muskox. Within the joint submission, the GN withdrew its recommendations around the need for back-up wildlife monitoring plans.[360] During the 2016 Final Hearing the KIA indicated that it considered this issue resolved based on additional commitments made within the revised WMMPP.[361]

During the 2016 Final Hearing, the KIA and the GNWT expressed additional concerns regarding Sabina's reliance on collar data to retrospectively analyze shifts in caribou calving and post-calving ranges to assess the effectiveness of mitigation measures and recommended that additional detail be provided for the cessation of outdoor activities should the core range for calving and post-calving caribou overlap with the Project in the same year it occurs. The YKDFN also added that Sabina should further illustrate in its WMMPP how monitoring core caribou habitat would influence following years' mitigation measures should they be required.[362] In response, Sabina reiterated that the calving grounds of both the Bathurst and Beverly caribou herds would not overlap with the project site and added that based on historical monitoring, calving ground shifts happen very slowly and this analysis would be effective to allow for yearly adaptive planning. Sabina further added that standard monitoring and mitigation measures would still be in place, including site monitors, during the calving and post-calving periods which would trigger mitigative actions should caribou be within different ranges of the project site.[363] To obtain additional details from Sabina on specific mitigation measures that would be employed during staged reduction scenarios, the KIA suggested that it continue discussions with Sabina offline. Within its concluding statements, the KIA stated that the adaptive wildlife management approach included in Sabina's updated wildlife management plans would be sufficient to adjust caribou management concerns and that it was satisfied the management and monitoring commitments made with respect to the protection of caribou around the proposed mine site. [364,365]

The KIA and the GN further recommended that Sabina develop a framework to more clearly collect data, as well as test and monitor predictions made in the FEIS in order to inform associated adaptive management protocols. To do so, the KIA recommended that Sabina form a wildlife working group

[360] Sabina Gold & Silver Corp. and Government of Nunavut, Joint Submission, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[361] Kitikmeot Inuit Association, 2016 Final Hearing Presentation, Exhibit 59, NIRB 2016 Final Hearing File No. 12MN036, April 27, 2016.
[362] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 324, lines 11-17.
[363] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 236-238, lines 23-26 and 1-18.
[364] P. Emingak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1345, lines 1-4 and 8-10.
[365] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.

comprised of interested parties to develop a more detailed conceptual outline for a wildlife effects monitoring program that would formalize study timelines, contribution agreements, and data-sharing agreements within the program. Additionally, the GN noted that it supported Sabina's plans to collaborate on government-led regional studies; however, it recommended that revisions to Sabina's monitoring programs should include suitable back-up plans for the monitoring of wildlife species in the event that collaboration with government bodies does not occur or where government-led monitoring programs are unsuitable for monitoring project-specific or cumulative effects. The parties also recommended that Sabina revise its proposed WMMPP to incorporate a study of wildlife responses to different project-related noises in conjunction with the collection of data on noise generated by the Project, as concerns were noted regarding the methodologies used by Sabina to determine zones of influence around proposed project activities and components. During the 2016 Final Hearing the KIA indicated that it decided to not pursue the request for further grizzly bear monitoring as additional monitoring could result in impacts to grizzly bear from helicopter disturbance.[366] The KIA and the GN further indicated during the 2016 Final Hearing that they considered this issue resolved given Sabina's commitment to undertake additional regional noise and behaviour monitoring programs. [367,368]

The GWNT, the NSMA and the YKDFN expressed concerns regarding the lack of effects monitoring for caribou within Sabina's monitoring plans. The three (3) parties noted specific concerns regarding the uncertainty surrounding the size, magnitude, and implications of the potential ZOI surrounding the Goose PDA and winter ice roads, and how effects monitoring would be conducted and in turn influence adaptive management protocols and cumulative effects management. As a result, the parties recommended that Sabina develop a focal species monitoring program for caribou that would reduce uncertainty surrounding the extent, magnitude, and implications of the potential ZOI surrounding project components through a caribou distribution change program and/or a caribou behaviour monitoring program. The GNWT also recommended that Sabina continue to engage with government, industry, and interested stakeholders in the development of caribou monitoring protocols and initiatives to address cumulative effects on the Bathurst caribou herd. Additionally, the NSMA recommended that Sabina revisit its Air Quality Management and Monitoring Plan to include dustfall as a potential contributor to the Project's ZOI and include dust monitoring locations 15 km downwind or beyond from major dust sources. During the 2016 Final Hearing, the GNWT suggested that its concerns regarding effects monitoring were addressed within the revised WMMPP and through commitments made during discussions with the KIA and the GN; however, recommended continued collaboration throughout the plan's development and engagement as plans and measures are refined.[369]

In response to the NSMA's recommendation to incorporate additional dustfall monitor stations, Sabina indicated that the majority of dustfall would be expected to fall within 100 m of the Project, with very little change in dustfall beyond 300 m. Sabina stated that its current proposed monitoring program includes stations at 30 m, 100 m, one (1) km, three (3) km, and five (5) km downwind of high activity areas, and that no detectable increase in dust would be expected beyond four (4) km, making the five

[366] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 632, lines 17-24.
[367] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 633, lines 4-9.
[368] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 419-420, lines 23-26 and 1-15.
[369] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 685-686, lines 21-26 and 1-11.

(5) km monitoring station a control site. Further, Sabina noted that one (1) additional monitoring site between the Goose PDA and the MLA PDA would be beyond the potential ZOI distance for caribou and would be expected to provide an adequate measure of background dustfall concentrations. Sabina noted that in addition to dustfall control measures, results from dustfall monitoring would contribute to adaptive management protocols for caribou.

During the 2016 Final Hearing, a Community Representative from Behchokǫ̀ requested that Sabina clarify how it would be monitoring dust, noting that dust produced from the Ekati Diamond Mine in the NWT has been recorded up to 30 km from the mine site, which can impact caribou health and nutrition. In response, Sabina clarified dimensions of the dust monitoring and adaptive management programs and noted that the Ekati Diamond Mine has a much larger operational footprint and is over five (5) times the size of the proposed Back River Project.[370]

During the 2016 Final Hearing, a youth representative from Kugluktuk requested that Sabina clarify how it would adaptively manage impacts to caribou should monitoring indicate that caribou are being affected by the Project.[371] In response, Sabina explained that within the WMMPP protocols are clearly defined that initiate adaptive management procedures should monitoring indicate that project activities are affecting caribou and wildlife. Sabina further clarified that effects identified as unacceptable within their current parameters would be subject to their adaptive management protocols, and that ongoing discussion with communities and government departments would also supplement measures taken.[372]

The KIA, GN, GNWT, NSMA, and the YKDFN expressed concern regarding insufficient levels of detail and scientific rationale included within Sabina's caribou-specific monitoring framework. Parties noted that throughout the information response period additional details were requested from Sabina on the reasoning behind its proposed use of a 25 km radius threshold to trigger monitoring activities based on caribou collar data, as well as how monitoring would be accomplished once caribou were detected through collar reports within 25 km of the project site during the calving and post-calving periods. The KIA noted in its 2016 final written submission that it disagreed with Sabina's rationale for the threshold radius and suggested that Sabina underestimated the distance caribou may travel during the post-calving migration period. Based on relevant scientific data, the KIA noted that caribou can travel up to 20 km per day during the post calving period. Given the estimated lag time of three (3) days for collar data to report caribou locations, the KIA noted that caribou shown to be 74 km away from the project area could be within a 14-km ZOI before collaring reports would be received. The KIA recommended that to employ a more conservative approach to monitoring, Sabina should incorporate a 74 to 85 km monitoring threshold to account for satellite collar data lag times and potential caribou movement rates. The KIA also suggested that Sabina work with the recommended wildlife working group to develop a mutually agreeable caribou monitoring plan, provide more details related to dedicated monitoring staff, and work with the GNWT on a satellite data sharing agreement to allow for near real-time access to caribou locations. The GN recommended that the Proponent more clearly illustrate technical specifications and measures for regional caribou monitoring within a revised WMMP that

[370] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1045-1046, lines 14-26 and 1-9.
[371] C. Westwood, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1030, lines 11-20.
[372] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1031-1032, lines 6-26 and 1-5.

would account for potential interactions with the Beverly caribou herd and other herds that could potentially interact with the proposed project.

In its response to the 2016 final written submissions, Sabina indicated that the threshold triggers were based on professional knowledge of caribou movement rates during post-calving periods and estimated collar reporting lags. Sabina further noted that reporting from satellite collaring is typically delayed several days, and therefore buffers were established larger than the predicted ZOI surrounding project activities. Within Sabina's revised WMMPP additional lag time and monitoring details were provided to address concerns submitted by the respective parties (see Section 4.11.1: Views of the Proponent). The GNWT noted during the 2016 Final Hearing that its concerns related to lag times were addressed in the revised WMMPP with the incorporation of active monitoring throughout calving and post-calving seasons, the identification of a 14-km biological buffer, and the addition of monitoring blinds and towers to monitor caribou near the project site.[373] Within its concluding statements during the 2016 Final Hearing, the KIA stated that the adaptive wildlife management approach included in Sabina's updated wildlife management plans would be sufficient to adjust caribou management concerns and that it was satisfied the management and monitoring commitments made with respect to the protection of caribou around the proposed mine site. [374,375]

During the 2016 Final Hearing, the KIA requested additional clarification from Sabina as to why its proposed monitoring program did not include the monitoring of reproductive success for grizzly bear and wolverine. In response, Sabina indicated that within its FEIS methodology, reduction of reproductive productivity was included as a summary effect that considered the overall impact of all potential residual effects. Sabina indicated that while it would not be monitoring the effects of reduced reproductive success specifically, it would be monitoring the three (3) residual effects for grizzly bear and wolverine which include habitat loss, avoidance of the project site, and attraction to the project site.[376]

The GN and the NSMA recommended that Sabina revisit its Noise Abatement Plan and the WMMPP to include noise level monitoring for wildlife as opposed to monitoring exclusively for human hearing ranges, as human ranges may not trigger the required mitigation for wildlife and the monitoring program as proposed would not likely mitigate noise disturbances. The GN added in this regard that Sabina should incorporate a study of wildlife responses to project noise sources with concurrent collection of data on noise gradients generated by the Project. The GN further noted that Sabina should clarify the expected maximum expected aircraft traffic rates by type, frequency, destination, project phase and season, as well identify how these rates were incorporated into the effects assessment for wildlife. Within its joint submission submitted during the 2016 Final Hearing, the GN requested to withdraw this recommendation.[377]

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[373] A. Pateneaud, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 683-684, lines, 8-26 and 1-11.
[374] P. Emingak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1345, lines 1-4, 8-10.
[375] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[376] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 246-247, lines 13-26 and 1-18.
[377] Sabina Gold & Silver Corp. and Government of Nunavut, Joint Submission, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.

Similarly, the GNWT, NSMA, and the YDFN requested clarification from Sabina on how the monitoring of effects on caribou, particularly noise effects, would supplement adaptive management protocols. The GNWT also requested clarification on why avoidance response monitoring was not used to establish the potential ZOI distances, particularly during periods of high sensitivity such as calving and post-calving. In response, Sabina stated that all results from its various monitoring programs would be reported as part of its Wildlife Effects Monitoring Program and WMMPP that would be made publicly available through the NIRB for comment. Sabina added that the results from its monitoring programs would be used to amend mitigation and monitoring components, such as trigger distances, group size determinations, specific activity periods, and additional infrastructure, as needed.[378,379,380] Sabina also stated that trigger distances during calving and post-calving periods were establish somewhat arbitrarily, but were doubled as compared to other times of the year as a conservative measure. Sabina clarified that noise as well as dust monitoring at different distances from the project site would contribute to its ZOI monitoring program to further supplement its adaptive management protocols.[381] Sabina added that its monitoring trigger distance were based on its understanding of caribou effects and responses to noise, and noted that monitoring from raised towers is the only feasible solution for distance monitoring at the moment.[382]

During the 2016 Final Hearing, the GN further recommended that Sabina incorporate a provision within its WMMPP to include enhanced camera monitoring should muskox populations increase. The GN also noted that given the current low densities of wolverine in the area, the revised plan will serve the needs of the effects monitoring, however, encouraged Sabina to undertake cumulative effects monitoring for both muskox and wolverine.[383] The GN indicated during the 2016 Final Hearing that it considered this issue resolved given Sabina's commitment to undertake additional regional noise and behaviour monitoring programs. [384]

During the 2016 Final Hearing, the GN requested clarification from Sabina on how it considered a precautionary approach to effects monitoring for caribou, suggesting that within Sabina's current monitoring framework, longer-term more subtle impacts do not appear to be considered. In response, Sabina reiterated several monitoring components that were incorporated into its revised WMMPP, including active monitoring protocols during calving and post-calving seasons, collar monitoring programs, amended trigger distances for monitoring and mitigation, a ZOI monitoring program, as well as a stress monitoring program. Sabina added that results from these respective monitoring programs

[378] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 282-283, lines 10-12.
[379] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 303-304, lines 26 and 1-26.
[380] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 315, lines 11-22.
[381] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 284-285, lines 8-26 and 1-2.
[382] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 331-322, lines 25-26 and 1-20.
[383] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 415-416, lines 17-26 and 1-4.
[384] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 419-420, lines 23-26 and 1-15.

would complement existing adaptive management protocols to manage potential effects as new information was gathered.[385]

During the 2016 Final Hearing, Board staff questioned Sabina as to whether it analyzed how exploration activities around the Goose Lake property may have influenced shifts in caribou habitats over the past 30 years. In response, Sabina noted that as part of its monitoring and analysis for regional effects to caribou it has and would consider the distribution of recent collar data as well as collar data before construction and over the past 20 years when camp activities were variable.[386]

Within their respective 2016 final written submissions the GN, the Łutsel K'e Dene First Nation (LKDFN), the NSMA and the YKDFN noted concerns regarding the general assessment methodologies used to assess wildlife and caribou within the FEIS, in addition to the underestimation of caribou interactions with the Project and potential associated impacts. The GN noted through the 2016 final written submissions and during the 2016 Final Hearing that within the FEIS, Sabina's interpretation of aerial surveys, motion-triggered camera surveys, and satellite collar data tended to underemphasize the extent to which caribou, in particular the Beverly herd, would interact with the Project. The GN indicated that the overestimation of caribou summer ranges by Sabina resulted in an underestimation of the overlap between the Project and herd ranges. Additionally, the GN noted in its 2016 final written submission and during the 2016 Final Hearing that overlap analysis should have included annual herd variations for the Beverly caribou herd and accounted for shifts in herd ranges. Further, the GN noted that an estimation of herd density should have been considered for caribou in the effects assessment to calculate the number of individuals potentially impacted, the frequency of exposure, and the proportion of the herd exposed. In the same regard, the GN requested that Sabina clarify how the option of an extended Project life-span was incorporated into the project-specific and cumulative effects assessment. The GN noted in its 2016 final written submission and during the 2016 Final Hearing that due to the limitations of Sabina's assessment methodology, conclusions should have been assigned a low degree of confidence and should be considered long-term, particularly with regards to disturbances and changes in the reproductive productivity of wildlife.[387]

In its response to the 2016 final written submissions and during the 2016 Final Hearing, Sabina indicated that the original development of the WMMPP was based on comments provided from parties during the Draft Environment Impact Assessment phase, and direction from the Minister, to focus its assessment on the Bathurst caribou herd. Sabina noted that the revised WMMPP was developed in consultation with the KIA, the GN, and the GNWT to address the respective parties' concerns and included new regional monitoring and mitigation measures for caribou (including the Beverly herd), grizzly bear, muskox, and wolverine (see Section 4.11.1: Views of the Proponent).[388] Sabina added that the WMMPP was intended to be updated as needed to include new monitoring and mitigation techniques. Sabina further clarified that the wildlife assessments within the FEIS considered a project lifespan of 27 years,

[385] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 272-275, lines 18-26 and 1-5.
[386] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 334-335, lines 15-26 and 1-3.
[387] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 413, lines 4-16.
[388] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 258-259, lines 14-26 and 1-3.

and that should the Project extend beyond this lifespan it would be the NIRB's responsibility to dictate what steps should be taken.

During the 2016 Final Hearing, the GN requested further clarification from Sabina on how it interpreted Bathurst and Beverly calving and post-calving herd ranges in relation potential overlaps with the Project. The GN noted that within Sabina's presentation on terrestrial wildlife (Exhibit 24, 2016 Final Hearing)[389], the Project was described as having no overlap with the calving and post-calving ranges for the Bathurst and Beverly caribou herds. The GN acknowledged Sabina's response that the 50% kernel ranges would not overlap with the Project; however, noted that the 95% kernel post-calving range for the Beverly herd overlaps significantly with the Project.[390,391] In response, Sabina stated that the variable of defining a caribou as being in its post-calving or summer range is based on a schedule that can fluctuate seasonally depending on a variety of factors. Sabina further clarified that Beverly caribou do occur within the project area in larger numbers during the summer season, and depending on the seasonal fluctuations, could occupy their summer range during a time that would be considered the post-calving season. Sabina added in conclusion that Beverly caribou have only occupied their summer range earlier than usual (during the post-calving season) three (3) years out of the last 16 years and that the proposed WMMPP has planned for these occurrences.[392]

The GNWT also expressed concerns during the 2016 Final Hearing regarding Sabina's reliance on collar data for its effects assessment within the FEIS, noting that only a small percentage of caribou are collared, which can produce misleading data when considering the location and density of herd ranges. In response, Sabina acknowledged that limitations exist with the use of collar data, however, added that for the collection of baseline data, other survey methods, such as motion camera monitoring and aerial monitoring, supplemented and often supported collar data findings. Sabina added that while collar data is used for planning purposes in monitoring potential herd overlaps with the Project, it would rely on ground-based observations by trained caribou monitors to trigger management measures.[393] During the 2016 Final Hearing the GNWT noted that its concerns pertaining to the reliance on collar data were mostly addressed and that it sees good potential in the use an early detection buffer of 14 km, monitoring towers, and cameras.[394]

During the 2016 Final Hearing a Community Representative from Kingaok (Bathurst Inlet) requested that Sabina clarify details around its motion-triggered camera monitoring program including how often it verifies the status of the cameras to confirm whether they have been affected by weather damage, animal interaction, or power loss. In response, Sabina clarified that the camera monitoring program utilized 65 cameras, with 15 located around the MLA, and that approximately five percent (5%) of cameras were compromised throughout the program from wildlife disturbance or battery power loss.

[389] Sabina Gold & Silver Corp. 2016 Final Hearing Presentation, Exhibit 24, NIRB 2016 Final Hearing File No. 12MN036, April 25, 2016.
[390] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 254, lines 7-21.
[391] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 256, lines 10-25.
[392] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 256-257, lines 26 and 1-24.
[393] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 291-292, lines 8-26 and 1-21.
[394] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 683-684, lines 18-26 and 1.

Sabina added that cameras were surveyed twice per year, normally during the spring season and later in September, and that camera failure and maintenance is built into its monitoring program to account for technical or environmental failures. [395]

During the 2016 Final Hearing the GNWT further requested that Sabina clarify its classification for what constitutes sensitive caribou seasons. The GNWT noted that Sabina's suggestion that summer and fall seasons are not sensitive is not consistent with caribou ecology, and that caribou during these periods are also vulnerable to disturbance. In response, Sabina noted that its definition of sensitive periods within the WMMPP was adopted from the GN's submission to the Nunavut draft land use plan, where calving and post-calving periods were identified as being the most sensitive. Sabina added that while mitigation and monitoring measures would be augmented during calving and post-calving periods, monitoring and mitigation would still be ongoing during the summer and fall seasons.[396]

During the 2016 Final Hearing the YKDFN questioned Sabina as to whether it conducted energetics modelling to calculate what the energetic cost of deflection would be on caribou if calving grounds were to shift, noting that its members have observed significant shifts in the Bathurst herd range in recent years. In response, Sabina highlighted various surveys and habitat studies it conducted to determine potential habitat loss as a result of the proposed Project, however, it noted that energetics modelling was not considered within its assessment.[397] Similarly, the YKDFN also questioned Sabina as to whether it considered forest fire impacts and climate change models within its habitat loss effects assessment for the Bathurst caribou herd. In response, Sabina reiterated that the proposed Project would not overlap with the Bathurst herd range based on range data from the past 20 years. Sabina clarified that its evaluation considered potential habitat disturbance layers from direct infrastructure as well as a four (4) and 14 km noise disturbance layers, however, climate change was not considered within its habitat modelling. Sabina added that its effects assessment evaluated the potential for three (3) separate herd shift scenarios including the status quo scenario with no shift, the potential for the Bathurst herd to reoccupy its former calving ground on the east side of Bathurst Inlet, and a third scenario based on Traditional Knowledge reports evaluating the potential for calving grounds to shift around the Contwoyto and Nose lake areas. [398]

A Community Representative from Bathurst Inlet asked Sabina:

> *Right now you're seeing very low numbers of the caribou population, but let's say in the next 10 to 20 years the population grows 60 to 70 percent. Is Sabina willing to, let's say, pause your activities for the caribou to -- if they were overlapping your areas of operations? [399]*

In response, Sabina reiterated its commitments within the WMMPP to employ the staged reduction of activities should groups of caribou approach the project area, especially during sensitive periods such as

[395] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1058, lines 18-26.
[396] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 289-290, lines 5-26 and 1-7.
[397] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 311-312, lines 3-26 and 1-25.
[398] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 329-330, lines 5-26 and 1.
[399] Cassel Kapolak, Bathurst Inlet, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, p. 1286, lines 11-17.

calving and post-calving. Sabina further identified activities such as helicopter traffic, blasting, and large truck movement as being activities that would be progressively restricted should caribou approach the project area. However, Sabina reiterated that operationally and logistically a full shutdown of the project site would not be feasible. Sabina concluded that continuous monitoring would be used to identify shifts in herd habitat usage and seasonal proximity to the project area which would supplement its mitigation planning.[400]

During the 2016 Final Hearing, the KIA questioned Sabina as to whether it would cease operations on the winter ice road to protect the migration of Beverly caribou, and in particular pregnant females, during herd's migration to calving grounds. In response, Sabina noted that based on collar data, only one percent (1%) of the Beverly herd would be expected to cross the proposed winter ice road during spring migration. Sabina added that within the WMMPP additional collaring analysis, monitoring measures, and mitigation protocols were proposed to protect caribou that might cross the road during this sensitive period. The KIA clarified its question, noting that monitoring and associated mitigation would be difficult on the winter ice road given its size, the variable accuracy of collar data, and the likely influence of climate change over the next 20 years. The KIA indicated that it would prefer that a specific date be established to initiate emergency mitigation during exceptional circumstances. Sabina further commented that it would prefer to avoid absolutely restricting use of the road during the April season, but that it would be open to discussing appropriate mitigation with the KIA to develop a relevant commitment.[401] Within Exhibit 92 (2016 Final Hearing) Sabina committed to developing a plan for winter ice road use cessation and management in April to protect the spring migration of the Beverly caribou herd (see Section 4.11.1: Views of the Proponent).[402]

The KIA further requested during the 2016 Final Hearing that Sabina revisit its proposed monitoring trigger distance threshold around the winter ice road of 250 m. Similarly, the GN requested that Sabina clarify its mitigation plans should large groups of caribou be encountered on the winter ice road. In response, Sabina indicated that it had no objections to the incorporation of a 500 m observation distance, and incorporating this measure within a joint submission with the KIA. [403,404]

Within its 2016 final written submission, the GN noted concern regarding Sabina's determination that no residual effect would result from the development and use of the proposed winter ice road. The GN noted that Sabina's determination was based on the assumption that traffic rates would be too low to disrupt wildlife and create a barrier to movement, that the area of the winter ice road would only assume a small portion of the winter range of wildlife such as the Beverly herd, and that mitigation measures would minimize the potential for impact to occur. With regards to traffic rates, the GN noted that Sabina's estimations were low as traffic due to road maintenance and personnel transportation was not considered. Further, the GN noted that scientific literature and Traditional Knowledge both identify the potential for winter ice road development and use to act as a barrier to wildlife. With regards to the

[400] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1286-1288, lines 18-27 and 1-17.
[401] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 242, lines 9-14.
[402] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[403] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 245-246, lines 18-26 and 1-3.
[404] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.

assessment of area impacted, the GN noted that the use of "area impacted" as assessment methodology for the winter ice road can significantly underestimate wildlife interaction rates and that the metric used does not provide a reliable estimate of the number of animals that could potentially interact with a disturbed zone during the course of a season. Further, the GN indicated that the effects assessment for the winter ice road relied on the presumed effectiveness of mitigation measures and did not consider public use of the road. During the 2016 Final Hearing, the GN further recommended that Sabina undertake harvesting monitoring should incidental monitoring reveal extensive use of the road for harvesting.[405] In its response to final submissions, Sabina clarified its effects assessment methodology noting its analysis of the Beverly herd's past interaction with the RSA, recent monitoring results, winter ice road traffic estimates, and development of mitigation measures based on similar projects in the north. Sabina reiterated its conclusion that the potential for project-related effects from the winter ice road on Beverly caribou is low, and that its "not significant" conclusion was warranted based on its determination that the density of caribou in the RSA during winter would be low, traffic on the road would be lower than reported thresholds for disruption of movements for a variety of ungulate species, and that mitigation and management would be consistent with industry best practices in the Canadian Arctic and elsewhere. In response to a request from the GN for additional detail regarding what other types of traffic would be using the winter ice road, Sabina suggested during the 2016 Final Hearing that additional traffic on the road would be very minimal and would be constrained primarily to maintenance and movement of personnel.[406] During the 2016 Final Hearing, the GN acknowledged that Sabina included enhanced monitoring in its revised WMMPP, however, suggested that additional mitigation measures should be included to address road closures during migration periods or when large groups are encountered.[407] Within the GN and Sabina's joint submission (Exhibit 96, 2016 Final Hearing) Sabina committed to updating the WMMPP to implement a direct monitoring program should its incidental monitoring program record more than five (5) persons per year on the road for harvesting purposes. Within the submission, Sabina further committed to including specific details on additional monitoring and mitigation that would be triggered should large groups of caribou occur near the winter ice road (see Views of the Proponent).[408]

During the 2016 Final Hearing, Board staff requested that Sabina describe how den surveys were carried out along the proposed routing for the winter ice road and whether it assessed the potential for winter ice road traffic to disturb denning and hibernating animals. Sabina stated in response that a variety of den surveys were conducted during its baseline studies which focussed mostly on wolf den surveys, however, also included grizzly bear and wolverine dens. Sabina indicated that dens in the area were evaluated in terms of their overlap with the proposed winter ice road as well as their likelihood of occurring through soil mapping. Sabina further noted that for grizzly bear, heat detection camera technology would also be utilized to identify denning areas while planning ice road routing.[409]

[405] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 418, lines 2-17.
[406] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 276, lines 1-23.
[407] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 418, lines 18-26.
[408] Sabina Gold & Silver Corp. and Government of Nunavut, Joint Submission, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[409] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 331-332, lines 22-26 and 1-26.

During the 2016 Final Hearing, Board staff requested that Sabina provide further detail regarding what specific considerations it made in the selection of a winter ice road in place of an all-weather road.[410] In response, Sabina noted that it proposed a winter ice road to connect the Goose Property and the MLA to reduce costs associated with all-weather roads, but also to reduce impacts on caribou and other wildlife.[411]

A representative from the Cambridge Bay Hunters and Trappers Organization requested clarification on how snow accumulation would be managed on the winter ice road:

> *…how high will the ice road snow banks go? How high? Because we have seen the ice roads going from Cambridge Bay to Hope Bay along the sea ice, the snow banks get really, really high, and that becomes dangerous for the animals trying to cross…* [412]

In response, Sabina noted that within the FEIS, it committed to managing the height of snowbanks firstly to ensure passage of wildlife, and secondly to ensure that monitoring and driver identification of wildlife is possible. Sabina further added that appropriately-sized equipment would be available to manage snow accumulation in this regard.[413]

During the 2016 Final Hearing, the GN and the GNWT requested further clarification from Sabina regarding the estimated mine life should production rates be reduced, or other deposits be discovered, thus potentially extending the life of the proposed Project and subjecting wildlife to further potential impacts due to extended operations. In response, Sabina noted that all management plans would be living documents and that should mine life extend beyond the expected timelines, there would likely be changes and different expectations from parties and regulators accordingly that would be reflected in its plans. Sabina further clarified that the longest mine life considered through all economic assessment and feasibility studies conducted was 12 years.[414] In response to the GNWT, Sabina stated that the George Property could be a potential future development, but that it would require significant additional work to reach feasibility and would be subject to further assessment by the NIRB and other parties should it be proposed in the future. Sabina clarified that although other exploration properties could initiate future development, the current proposal constitutes its plans for the near to medium-term future.[415] The GNWT added during the 2016 Final Hearing that should the Project proceed and propose to expand in the future, results from the propose monitoring programs should be used to supplement a more comprehensive cumulative effects assessment that goes beyond its habitat-based approach.[416]

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[410] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 80-81, lines 20-26 and 1-2.
[411] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 81, lines 3-12.
[412] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN026 Transcript, April 28, 2016, p. 813, lines 20-24.
[413] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN026 Transcript, April 28, 2016, p. 817, lines 10-22.
[414] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 253-254, lines 7-26 and 1-6.
[415] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 293-295.
[416] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 687-688, lines 6-26 and 1-8.

Similarly, the YKDFN and Board staff questioned Sabina as to whether its cumulative effects assessment included the potential for the Project to expand should economic circumstances allow for further development in the future. Board staff also requested clarification from Sabina as to whether its cumulative effects assessment for caribou considered future exploration activities, particularly in the Wishbone area, and whether it identified potential study areas, ZOI, and potential effects to caribou in relation to this potential development. In response, Sabina noted that within the FEIS a cumulative effects assessment was conducted for both the Beverly and Bathurst caribou herds that considered all past, present, and potential future developments, as well as exploration activities in the George and Hackett River areas.[417,418] Through a deferred response Sabina clarified that exploration activities have not been conducted on the Wishbone property since 2012 and that it had no intentions of resuming activities in the foreseeable future.[419]

Environment and Climate Change Canada (ECCC) noted in its 2016 final written submission that pursuant to the *Species at Risk Act* (SARA) an environmental effects assessment must include identification of potential adverse effects of projects on Schedule 1 wildlife species and their critical habitat and proposed mitigation and monitoring measures. ECCC noted that it was encouraged by Sabina's development of specific mitigation and monitoring measures for species under consideration for listing in the SARA and considered species of "Special Concern" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) including the Dolphin and Union caribou herd, grizzly bear, and wolverine. ECCC recommended that Sabina employ avoidance as its primary mitigation measure, monitor any potential adverse effects of the proposed Project to noted species and its habitat, and also evaluate the effectiveness of mitigation to establish adaptive management strategies. ECCC further recommended that Sabina consult and report to appropriate regulatory bodies to contribute to species at risk recovery strategies and action management plans. In its response to the 2016 final written submissions, Sabina acknowledged the referenced legislation and noted that all wildlife species listed by COSEWIC in Table 1 were evaluated in the FEIS. Sabina further noted that the WMMPP included a hierarchy of mitigation that follows the requested ECCC objective of avoiding effects to species at risk and that species at risk would be evaluated using the proposed monitoring measures included in the WMMPP. Sabina noted that an updated WMMPP was developed in consultation with the GN, and committed to consulting with the GN, ECCC, and other parties to address future species at risk concerns and to develop updated mitigation and monitoring measures as needed. During 2016 Final Hearing, ECCC noted it was satisfied with commitments made by Sabina and indicated that it was confident that any remaining uncertainties could be addressed through the continued development of monitoring and management plans.[420]

The LKDFN and the YKDFN expressed specific concerns regarding the underestimation of predicted caribou habitat loss, herd deflection, disturbance, indirect mortality, and reduction in reproductive productivity resulting from the Project, in addition to Sabina's reliance on data collected through

[417] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 335-336, lines, 24-26 and 1-5.
[418] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 336, lines 13-18.
[419] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1062-1063, lines 3-26 and 1-17.
[420] L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 454, lines 5-14.

satellite collar surveys to determine herd range and interaction impact estimates. Both parties disagreed with several impact significance determinations stated within the FEIS and noted that science-supported Inuit Traditional Knowledge would disagree with Sabina's determination that the Project would not have a negative impact on caribou habitat. Similarly, the LKDFN and the NSMA disagreed with Sabina's cumulative effects determination for the Bathurst and Beverly caribou herds. Both parties added that cumulative impacts on the herds are already significant and that additional effects on the herds should also be considered significant. The LKDFN recommended in its 2016 final written submission and during the 2016 Final Hearing that the NIRB not approve the Project due to the current state of the Bathurst herd, the deteriorating state of the Beverly herd, and the cumulative effects that would result from the development on caribou.[421] The YKDFN noted that the loss of caribou habitat caused by the Project is of critical significance as the Bathurst herd is not in a state that it can support more pressures and requested that Sabina provide more dedicated monitoring measures, extend triggers for caribou mitigation to include bulls and cows without calves, improve dust suppression strategies, undertake seasonal closures during calving and post-calving seasons, and provide monetary support to the YKDFN for on-land monitoring and compensatory mitigation. During the 2016 Final Hearing, the YKDFN reiterated their disagreement with Sabina's conclusions that impacts to caribou would not create residual effects, and recommended that the Project not proceed.[422] In response to a question from the GNWT, the YKDFN qualified its statement by noting that should the Project proceed, it should be subject to more thorough and comprehensive mitigation monitoring measures.[423] Likewise, the NSMA noted that it had outstanding concerns regarding a variety of mitigation and monitoring measures that would need to be addressed before it could support the Project.[424]

In its response to the LKDFN, NSMA, and YKDFN, Sabina reiterated components of the original WMMPP and noted revisions that would be added in response to comments received (see Section 4.11.1: Views of the Proponent). Sabina noted that for the staged reduction of project activities in proximity to caribou it would focus on reducing any potential project effects on caribou females, particularly females with calves, as this group was identified as being the most sensitive to potential project disturbances.[425] Sabina further noted that it would be willing to update the terminology used within the WMMPP to further clarify this classification.[426] Sabina reiterated its FEIS conclusions noting that collar data from the past 19 years indicated that all seasonal ranges for the Bathurst caribou herd fall outside of the Project's PDAs and outside its estimated ZOI for caribou. Sabina qualified its statement by noting that habitat loss was considered a residual effect for the Beverly herd; however, the loss would only be 0.01% of the Beverly herd's summer range, which would be the herd's largest seasonal overlap with the Project.[427] Sabina concluded in its response to the 2016 final written submissions and during the 2016 Final Hearing

[421] B. Sanderson, Łutsel K'e Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 709-710, lines 14-26 and 1-15.
[422] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 759-760, lines 26 and 1-6.
[423] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 770, lines 8-17.
[424] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1293-1297.
[425] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 324-325, lines 25-26 and 1-13.
[426] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 325-326, lines 23-26 and 1-6.
[427] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 299-300, lines 1-26 and 1-21.

that the Project is predicted to have no negative impacts on the Bathurst caribou herd and would not affect the recovery of the herd, and further noted that no additional mitigation measures are required for Bathurst caribou. Sabina added that it is committed to working with all groups as the project progresses and consulting with parties on various wildlife and caribou-related wildlife issues.

During the 2016 Final Hearing, Board staff requested clarification from the GN on the coordination that took place between the GN and the GNWT with regards to the assessment of potential impacts to the Beverly and Bathurst caribou herds.[428] In response, the GN suggested that wildlife biologists coordinated throughout their respective research initiatives; however, with regards to the environmental assessment process for this proposal, coordination only took place prior to the 2016 Final Hearing.[429]

During the 2016 Final Hearing, Board staff questioned the GNWT as to whether harvest restrictions on the Bathurst caribou herd have led to corresponding increases in the harvesting of other herds to compensate for harvesting restrictions.[430] In response, the GNWT noted that although its harvesting data is not complete, it does appear that other herds, such as the Bluenose-East herd, have experience increase pressure from harvesting deflection.[431]

During the 2016 Final Hearing, the NSMA requested that Sabina host periodic site visits for NSMA members during Bathurst caribou calving and post-calving seasons. In response, Sabina noted that as part of its Community Engagement Plan contained with the FEIS it plans to host select community members for site visits and further noted that it already had a standing commitment to include NSMA members in its site visit program.[432]

During the 2016 Final Hearing, an Elder originally from the Arctic Sound area near the community of Bathurst Inlet, spoke about Traditional Knowledge and the importance of caribou in the region, stating

> *My grandfather envisioned that there will be a meeting one day in regards to our homeland. So this is what I wanted to talk about today because I have not forgotten about my grandfather's vision...during the stories that my grandfather told us, there were many, many thousands of caribou that had calves and who were migrating to their calving grounds.*[433]

During the 2016 Final Hearing, several Community Representatives requested clarification from Sabina on its caribou research methods as well as how it would continue to monitor caribou throughout the Project. An Elder from Kugluktuk requested clarification from Sabina as to how and where it gathered caribou data for its impact assessment:

[428] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 432, lines 10-18.
[429] D. Baikie, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 432-433, lines 19-2 and 5-7.
[430] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 699, lines 9-17.
[431] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 699-701.
[432] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 92-93, lines 6-26 and 1-5.
[433] A. Kamuayuk, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 594-599.

> *…I'd like to know which communities have you researched the caribou populations. Is it just on the west side of your work site? Have you gone to the east of your work site to do caribou research?*[434]

A Community Representative from Kugaaruk asked questions with regards to historical caribou data:

> *Have you studied back, like, 30, 40, years? What was the movement; do you guys have any idea? And comparde to today, Is there a big difference? Like, after minings that were coming up beside Diavik and other mines, did it impact our caribous that migrate up north? Have you guys done any study on that before?* [435]

The representative further questioned:

> *How are you handling your waste chemicals, are you storing them in proper containment?... Do you guys do any studies on samples of any animals' contamination for any caribous regarding chemicals of any sorts? ... And animals don't have any borders; so they can migrate south and north and will be passed on and not knowing what they're consuming, chemicals they have. I'm concerned about that.*[436]

A community member from Cambridge Bay noted:

> *I know that in both NWT and Nunavut this has always been addressed, but the predators know when the caribou are calving, and with one calf for every cow, there are six pups to a wolf. So keep that in mind. And it would be nice to have a little bit more research done on the predators such as the wolves.*[437]

In response to these inquiries, Sabina indicated that the majority of studies included within the FEIS were completed by 2014 and consisted of research on the Bathurst, Beverly, and Dolphin & Union caribou herds. Sabina outlined that it considered scientific data collected as far back as the 1960s, which complemented Traditional Knowledge for Bathurst and Beverly caribou information.[438] Sabina further noted that it also relied heavily on caribou data provided by the GN and the GNWT and that it supplemented joint research done by the respective governments with its camera monitoring program. Sabina added that it has not conducted any type of aerial survey since 2010.[439] Sabina also clarified that the majority all chemicals would be stored in contained buildings and suggested that they would be inaccessible to wildlife. Sabina detailed containment measures that would be used on-site for the storage and protection of chemicals and also noted that chemicals no longer in use or needed would be shipped south during shipping seasons. Sabina further clarified that its effects assessment considered potential chemical contamination from a variety of project components, and that its monitoring

[434] M. Tiktalik, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 824, lines 3-12.
[435] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 840, lines 8-16.
[436] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1277, lines 6-26.
[437] B. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1310, lines 10-15.
[438] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 842-843, lines 9-26 and 1-5.
[439] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 826-827, lines 22-26 and 1-11.

programs were modified to address any potential risks of contamination. If required, Sabina noted that it would work with hunters and trappers organizations to conduct animal testing should it suspect wildlife contaminant issues.[440] The GNWT added in this regard that monitoring of contaminants in northern caribou have been ongoing for approximately 30 years, and that generally there fairly low levels of contaminants in northern caribou which would not be a concern for populations who harvest caribou.[441]

Similarly, during the 2016 Final Hearing Community Representatives requested that Sabina and other parties clarify the function and operation of caribou collaring, as well as how collars might affect caribou. Along with expressing concerns regarding potential impacts to caribou from the collars, representatives also inquired as to the environmental impacts that collars have when left on the land.

A Community Representative from Gjoa Haven stated:

> *Last year there was a meeting with regards to the Ahiaq caribou herd. We felt that the collars were too large for the caribou.*[442]

A representative from Taloyoak questioned:

> *Is there a purpose or --why there are so many caribou been collared? ...50 caribou has been collared. I know they are -- they are monitoring them. Perhaps is it only for the purpose of the mine that they are doing the monitoring?*[443]

A Community Representative from Behchokǫ̀ stated:

> *I do not - -to be honest with you, I do not really like -- like collaring of the caribou… Whenever you satellite the caribou, the caribou suffers with the satellite collar. The caribou is never the same… I have the killed a caribou at one time with a satellite collar. I gave that satellite collar back to the ENR, and that caribou was so out of shape, so skinny, and that caribou was pretty near, you know, pretty -- pretty well starving…*[444]

A representative from the Gjoa Haven noted:

> *Around the 1980s, I had caught a collared caribou…the one caribou that I caught that was collared, some parts of the neck, the hair had all gone, and the -- I was told -- told the battery was melted right into -- the acid was -- was right into the caribou's skin. It had been on the caribou for three years*.[445]

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[440] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1281, lines 3-10.
[441] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1282-1284.
[442] B. Putuguq, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1291, lines 2-4.
[443] S. Tulurialik, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1006, lines 4-17.
[444] M.L. Rabesca, Behchokǫ̀, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1041, lines 7-23.
[445] S. Hiqiniq, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1053, lines 18-26.

In response, Sabina clarified to Community Representatives that it does not own or operate the collaring studies, as they are joint initiatives undertaken by the GN and the GNWT. Sabina added that it utilizes data made available through the collaring programs, but deferred further clarification on the programs to the respective government representatives.[446] The GN noted that prior to conducting collaring activities, it consults with local communities to address any relevant issues and in its deferred response the GN added that satellite collars are designed to automatically release after three (3) years of use, and that with advancements in collar technology the collars are considered low risk compared to the value of information gained for caribou management and land use planning. [447] The GNWT echoed this response and noted that the collars do not emit sound and therefore should not affect caribou through noise, and that newer collars weigh only around 650 grams, slightly over half of their past weight of 1,100 grams.[448] The GNWT also noted that the number of collars deployed correlates with relevant research on what is required to properly and consistently define and illustrate caribou herd movement.[449] The GN further stated that prior to conducting collaring activities, it consults with local communities to address any relevant issues.[450]

In response to a question regarding whether the discarded collars negatively impact the environment when they are left on the tundra, the GN noted that in most circumstances attempts are made to recover the collars by tracking the active radio beacons, but in circumstances where the collars cannot be located, they would eventually degrade and that risks to the environment are considered minimal.[451] Similarly, the GN added that collars lost under sea ice would not be retrievable.[452] In response to a question on whether there is an alternative to collar monitoring, the GN noted that currently there is no equivalent alternative that provides the level of detail produced from collar monitoring, however, camera monitoring, satellite, and drone surveillance are all methods currently employed or under development in the field of wildlife monitoring.[453]

During the 2016 Final Hearing, a Community Representative from Cambridge Bay noted its support for the respective governments' collaring programs, stating:

> *…as far as the Cambridge HTO is concerned, we have no problems with collaring the caribou... As far as the Kugluktuk HTO is concerned, we are working with the Nunavut government with the*

[446] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1008, lines 7-21.
[447] D. Baikie, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1107, lines 4-21.
[448] A. Pateneaud, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1241-1242, lines 20-26 and 1-23.
[449] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1245-1246, lines 5-26 and 1-2.
[450] D. Baikie, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1107, lines 4-21.
[451] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1125, lines 8-18.
[452] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1132, lines 2-15.
[453] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1148-1149, lines 2-26 and 1-4.

project of collaring caribou from the Dolphin and Union herd because we have a concern that this particular herd is decreasing in numbers… [454]

During the community roundtable, Community Representatives expressed concerns regarding the declining state of the Bathurst caribou, the influence mining and development has had on caribou, and the state of caribou in general. A Community Representative from Cambridge Bay stated:

The caribou that's on Victoria Island, we've seen a decline in the population.[455]

A Community Representative from Dettah noted:

…the Bathurst caribou used to go around to Contwoyto Lake and to our area, but if they ever build that mine, that caribou may never go to our area. It is something that we can seriously think about, but people from Behchokǫ̀ that are here, all of the Elders from the community of Behchokǫ̀, and also people from Łutsel K'e are very concerned about the decline of the caribou. [456]

A Community Representative from Wekweètì stated:

…the Bathurst caribou in 1986, approximately around that time, there were over 400,000. Caribou were abundant at that time. And now from that time on, and the caribou had been declining dramatically…[457] *we're not blaming the mining company…Let's work together. Work together to see some sort of a solution, some sort of a solution about the decline of the caribou… if we work together, I'm pretty sure there will be a solution with the help of each other.*[458]

A Community Representative from Bathurst Inlet objected to Sabina's proposal noting:

Before the project proceeds with your activities, I would like to see the Bathurst herd's population increase 'cause we heard from the Government of the Northwest Territories that they have decreased by 95 percent, and that, to me, is a huge concern. I understand that if the caribou population were to increase, there would be potential impact, and Sabina states that there will be plans in place if that were to happen, but I would like to see the Bathurst herd population increase before the -- before Sabina gets the A-OK from me. [459]

During the 2016 Final Hearing, Board staff questioned a representative from the LKDFN to express his views on what factors, in addition to mining, may have contributed to the recent decline of the Bathurst

[454] J. Haniliak Sr. Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1275, lines 4-15.
[455] J. Haniliak Sr. Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1272, lines 3-5.
[456] A. Crapaud-Baillargeon, Dettah, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 919, lines 12-19.
[457] J. Judas, Wekweètì, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 945, lines 1-5.
[458] J. Judas, Wekweètì, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 946, lines 10-25.
[459] Cassel Kapolak, Bathurst Inlet, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1360, lines 6-16.

caribou herd. In response, the LKDFN representative suggested that the cumulative effects of exploration, mining, and hunting have all contributed to recent declines in the Bathurst herd's population. The representative clarified, however, that mining is the largest contributor and noted that cumulative noise impacts affect caribou health:

> *…the animals need to be in a calm and -- calm state to stay healthy and to reproduce, and then being agitated and scared all the time is not healthy, even for, like, mothers today shouldn't be so stressed out when they're pregnant, and it's not good for the pregnancy. Same with animals. They shouldn't be spooked all the time.*[460]

In response to a question from a Community Representative from Gjoa Haven as to whether the Bathurst caribou herd has ever experienced population declines in the past, the GNWT noted that Traditional Knowledge obtained from Tłı̨chǫ Elders suggested that in the 1940s the Bathurst herd was in high numbers, then went down to fairly low numbers and began recovering in the 1970s and the 1980s. The GNWT added that scientific surveys on the herds began in the 1950s and 1960s, with the focus on the calving grounds and defining the herds in the 1960s and 1970s and noted that survey results of the time were in agreement with the Traditional Knowledge determination. In response to a follow-up question on whether herd rebound is possible, the GNWT stated that herd recovery has been known to happen, although it is not guaranteed and will likely depend on highly variable impacts such as climate change.[461]

During the 2016 Final Hearing, the GNWT asked a representative from the LKDFN to share his observations on what types of effects caribou can experience from diamond mining in the NWT. In his response, the representative from the LKDFN noted that during his time working at the BHP Billiton mine, caribou were known to frequent the area; however, after four years of employment there were large declines in caribou sightings around the mine-site and around all-weather roads.[462]

During the 2016 Final Hearing, a Community Representative from Kugluktuk questioned the GNWT as to whether it believes that caribou herd population declines might be from impacts to mating, and also asked if declining herd population could be a result of climate change.[463] In response, the GNWT noted that declines in herd populations throughout the NWT seem to be the result of younger caribou death rates, reduced birth rates in June, and a greater number of calf deaths within their first year. The GNWT also added that it does not consider lack of mating to be a potential cause for herd declines, but rather poor cow health. With regards to climate change, the GNWT noted that it will undoubtedly have both positive and negative effects on caribou and that impact from changes to sea ice, water levels, vegetation, and seasonal snow conditions have yet to be evaluated.[464]

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[460] B. Sanderson, Łutsel K'e Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036, April 28, 2016, p. 746, lines 3-9.

[461] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, pp. 1269-1271, lines 13-26 and 1-2.

[462] B. Sanderson, Łutsel K'e Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036, April 27, 2016, p. 716, lines 9-26.

[463] C. Westwood, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript April 29, 2016, p. 1246, lines 21-26.

[464] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1247-1248, lines 12-26 and 1-19.

During the 2016 Final Hearing, the Kitikmeot Regional Wildlife Board discussed shipping corridors, winter ice roads, and expressed concerns regarding the vulnerable state of Bathurst, Dolphin & Union, Peary, and other caribou throughout Nunavut and the Northwest Territories noting:

> *We cannot emphasize enough caribou calving grounds, caribou habitat, and water crossings, as well as caribou migration routes be protected from development.*[465]

In response, Sabina acknowledge the KRWB's concerns around winter shipping and ice-breaking, and further clarified that its shipping activities are proposed within summer months only to ensure that impacts to the Dolphin and Union herd and its migration over sea ice would are avoided.[466]

During the 2016 Final Hearing, a representative from Kugluktuk questioned the GN as to whether it has plans to develop a predator control program to incentivize the hunting of predatory species as a means of caribou management. The representative noted that similar programs exist in the NWT for the hunting of abundant wolf species, and that this method should be considered as part of its collaring program to help protect the Bathurst, Beverly, and Bluenose East herds.[467] In response, the GN stated that it is not currently considering a predator control program, although it is something that has been discussed within the Department of Environment and remains a consideration for the future.[468]

Within its concluding statements during the 2016 Final Hearing, the KIA noted that it was satisfied with commitments included, and to be included, within Sabina's revised WMMPP and their ability to protect caribou in proximity to the mine site.[469] The GN indicated during its concluding statements that based on the treatment of its recommendations related to wildlife management measures throughout the Review of the project proposal, it would be in support of the Project and that further collaboration should address issues moving forward.[470] The GNWT noted that the Project, as proposed within the updated WMMPP and through additional commitments made throughout the 2016 Final Hearing, represents a reduced risk to the Bathurst caribou herd and that it was pleased with the adjustments made within the revised WWMP to extend collar monitoring and mitigation to the Beverly caribou herd; however, noted that appropriate planning should take place in the event that range shifts occur.[471,472] Prior to the submission of additional commitments contained within Exhibits 92 and 96 (2016 Final Hearing), the GNWT and the NSMA noted outstanding concerns related to mitigation trigger thresholds. Both parties recommended that a four (4) km threshold be used to trigger mitigation during calving,

[465] S. Qingnaqtuq, Kitikmeot Regional Wildlife Board, NIRB 2016 Final Hearing File No. 12MN036, April 28, 2016, p. 777, lines 6-9.
[466] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036, April 28, 2016, pp. 780-781, lines 16-26 and 1-10.
[467] L. Adjun, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1123-1124, lines 23-26 and 1-11.
[468] D. Baikie, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1124, lines 12-19.
[469] P. Emingak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1345, lines 1-4.
[470] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1118-1119, lines 23-26 and 1-4.
[471] A. Patenaude, Government of the Northwest Territories, 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1237, lines 9-18
[472] A. Patenaude, Government of the Northwest Territories, 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1236, lines 15-24.

post-calving, and summer seasons and that group size thresholds to trigger mitigation during calving and post-calving seasons be reduced to any cows and calves within the prescribed proximity.[473,474] During the 2016 Final Hearing, the LKDFN reiterated its recommendation to the Board that it not approve the Project to proceed due to the current state of the Bathurst caribou herd, the direct and cumulative impacts that would affect the Bathurst and Beverly herds, the use of improper impact assessment methodologies, and the need to allow the herd time to recover prior to subjecting it to any further disturbance.[475] The NSMA also highlighted further outstanding concerns related to wildlife mitigation, such as the need for additional noise suppression, further site shutdown criteria, further calving ground shift analysis, and additional research, which would have to be addressed before it could support the proposed Project.[476] The YKDFN stated that it opposed the Project due the threat it potentially poses on caribou and the associated impacts it would cause on Dene culture.[477]

During the conclusion of the 2016 Final Hearing, Community Representatives from Cambridge Bay, Kugluktuk, Omingmaktok (Bay Chimo), Gjoa Haven, Taloyoak, and Kugaaruk noted their support for the Project while highlighting that consultation still needs to occur should the Project proceed to supplement mitigation and monitoring plans to reduce impacts on caribou and other wildlife. As previously noted, a Community Representative from Bathurst Inlet opposed the Project, stating that the population of the Bathurst herd would need to recover before she could offer her support.[478]

During the 2016 Final Hearing the Burnside Hunters and Trappers Organization reiterated its concerns regarding caribou population and impacts to migration, however, noted that it was conflicted as to whether it could support the Project.[479]

Following the issuance of the 2016 Final Hearing Report, the NIRB was copied on correspondence from Sabina to the Minister of Indigenous and Northern Affairs regarding the Board's decision, which also included a detailed summary response to the NIRB's 2016 Final Hearing Report.

Additionally, the NIRB received, and/or was copied on, correspondence from several parties and individuals including members of the public; former Sabina employees; an investor; a group of Elders; the hamlets of Kugaaruk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugluktuk; businesses; the Cambridge Bay Community Advisory Committee; the Northwest Territories & Nunavut Chamber of Mines; the Kugluktuk Hunters and Trappers Organization; the Spence Bay Hunters and Trappers Association; and the World Wildlife Fund to the NIRB and/or the Minister of Indigenous and Northern Affairs regarding the Report and the Board's 2016 decision. The NIRB was also copied on

[473] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 684-685, lines 7-11 and 13-20.
[474] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1293-1294, lines 25-26 and 12-20.
[475] B. Sanderson, Łutsel K'e Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 709, lines 14-25.
[476] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1297, lines 23-25.
[477] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 759-760, lines 26 and 1-2.
[478] Cassel Kapolak, Bathurst Inlet, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1360, lines 6-16.
[479] Connie Kapolak, Burnside Hunters and Trappers Organization, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1362-1363, lines 25-26 and 1-6.

correspondence between the Government of Canada and select parties, including the Kitikmeot Inuit Association, the Government of Nunavut, the Government of the Northwest Territories, the Łutsel K'e Dene First Nation, the North Slave Métis Alliance, the Tłı̨chǫ Government, and the Yellowknives Dene First Nation, related to the Review of the Back River Project and the Board's decision.

Certain parties expressed support for Sabina and the Project for their confidence in the proposed environmental and wildlife protection and monitoring measures and the potential for positive economic impacts. Other parties supported the NIRB's decision due to ongoing concerns related to the protection of the environmental and wildlife, particularly caribou.

Within their respective final written submissions on the FEIS Addendum, the Kitikmeot Inuit Association (KIA), the Government of Nunavut (GN), Environment and Climate Change Canada (ECCC), the Government of the Northwest Territories (GNWT), the Burnside Hunters and Trappers Organization (BHTO), the Łutsel K'e Dene First Nation (LKDFN), the North Slave Métis Alliance (NSMA), and the Yellowknives Dene First Nation (YKDFN) submitted comments related to caribou and terrestrial wildlife, as well as comments on management measures contained within the Wildlife Mitigation and Monitoring Program Plan (WMMPP). Parties provided comments regarding continuity between versions of the WMMPP; caribou group size definitions; methodologies and scientific rationale for caribou group size determinations and zone of influence (ZOI) distance thresholds to trigger mitigation and adaptive management; effectiveness of mitigation and adaptive management measures for caribou, including during rapid and planned operational shutdowns; potential impacts to wildlife from the winter ice road, harvesting, and air traffic; regional and site monitoring measures; regional caribou management; Species at Risk; cumulative effects; as well as other related concerns. Within the submissions, a number of parties commended Sabina on updates made to the WMMPP since the 2016 Final Hearing, while also highlighting areas where Sabina had addressed concerns raised through earlier stages in the NIRB's Review of the Project. However, several parties highlighted areas of the WMMPP which require increased protection for terrestrial wildlife and caribou, with additional rationale to qualify the inclusion of specific management measures.

Within its final written submission on the FEIS Addendum, the KIA noted several discrepancies between Sabina's WMMPP versions related to staged reduction in project activities for helicopters; mitigation measures on the proposed winter ice road; clarity regarding the applicability of management measures for off-road heavy mobile equipment; and clarity regarding the applicability of monitoring, and adaptive management for caribou in groups of 3-30 in proximity to blasting. The KIA also expressed further concern regarding the protection of groups of 3-30 caribou noting that the revised WMMPP provided as part of the FEIS Addendum did not include measures previously included in the WMMPP presented at the 2016 Final Hearing, and that the revised WMMPP places more focus on mitigation for groups larger than 30, and less for those under the smaller group threshold. The GN commented on similar discrepancies in its submissions, noting that the revised WMMPP offers fewer protections than earlier versions of the WMMPP for groups of less than 30 caribou around project activities such as blasting, heavy equipment operation, and helicopter operations. The GN recommended that Sabina revise the WMMPP to enhance protective measures for smaller groups of caribou that fall below the primary threshold for triggering adaptive management. The NSMA also recommended that Sabina include details within its Behavioural Monitoring Program on how it would address a sensitive group of animals under 30 individuals in size, and that it manage cow-calf bonding and their activity budgets specifically during sensitive seasons.

In its response to the final written submissions on the FEIS Addendum, Sabina noted that discrepancies between the versions were not intentional and committed to updating the WMMPP to address and clarify the discrepancies identified, and further committed to clarifying the mitigation and monitoring measures that would be applicable to groups of 3-30 caribou. Sabina also provided clarification and additional commitments to monitor groups of caribou under 30 as part of the proposed Behaviour Monitoring Program, and committed to considering adaptive management protocols should animals in this group size respond significantly to blasting. Sabina discussed its mitigation and monitoring measures for small groups of caribou, as well as individual caribou, noting where the revised WMMPP was updated throughout the NIRB's Review process to clarify that current mitigation would be equal or more protective of caribou than previously proposed. Sabina provided details on changes made to caribou protection measures for small groups, as well for individuals, around on-site roads, blasting operations, aircraft operations, and heavy mobile equipment operations. Sabina highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing and committed to including revisions and updates within a revised version of the WMMPP to be more protective of small groups.

During the supplemental Final Hearing, the KIA requested that Sabina address select items identified as missing within Version 8 of the WMMPP (Exhibit 17) related to caribou protection including the addition of caribou avoidance measures for small groups of caribou in its decision chart; the inclusion of blasting protection measures for groups of 3-30 within specifics distances from the site as seen in previous versions of the WMMPP; the inclusion of previous behavioural and adaptive management details; and clarification on specific adaptive management triggers within Version 8 of the WMMPP.[480] In response, Sabina agreed to address the missing points for the next version of the WMMPP.[481,482]

During its presentation at the supplemental Final Hearing, the KIA stated its support for the Project subject to the KIA's requirements, and for the commitments, terms, and conditions that were jointly submitted with Sabina at the 2016 Final Hearing.[483,484] During the supplemental Final Hearing, the GN indicated that it considered this issue addressed based on Sabina's responses and commitments.[485]

Within its final written submission on the FEIS Addendum, the GN noted that the FEIS Addendum did not include revisions to the effects assessment for caribou, and as such, its review of the FEIS Addendum focussed on the revisions made to the WMMPP. Although the GN commended Sabina on the additional protection for caribou included within the revised WMMPP, it noted that it still had concerns regarding the limitations of the effects assessment and uncertainty regarding impact conclusions, the effectiveness of individual elements within Sabina's WMMPP to address uncertainty in the effects assessment, and the mitigation of potential impacts on caribou. The GN discussed Sabina's use of terminology such as "standard industry best practice", acknowledging that although the WMMPP plan

[480] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 437-438, lines 14-26 and 1.
[481] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 430-431, lines 25-26 and 1-23
[482] Sabina Gold & Silver Corp., Exhibit 106, NIRB supplemental Final Hearing File No. 12MN036, June 3, 2017
[483] S. Anablak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 419, lines 15-24.
[484] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 431, lines 24-26.
[485] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 453, lines 7-14.

sets a higher standard compared to other projects in the Canadian Arctic, this standard is warranted given the proposed Project's proximity to several caribou herds, limitations of the effects assessment, uncertainty in the significance of some project effects, and the concept that "best practice" does not necessarily mean effective practice until efficacy has been verified through evidence collected from systematic studies. The GN agreed that the proposed management measures contained within the revised WMMPP would be effective in minimizing direct mortality of caribou. However, the GN noted concerns related to Sabina's confidence in reducing sensory disturbance to caribou by highlighting uncertainties around the effectiveness of the proposed tower-mounted cameras, raised platform monitoring, caribou group size and distance trigger thresholds, and the interdependent nature of the proposed wildlife management systems. The GN noted that it supports Sabina's approach to adaptive management for minimizing disturbance to caribou and associated effects, but cautioned that this approach is largely untested in addressing outstanding uncertainty in the effects assessment and the risk of adverse and unacceptable effects. The GN recommended that, should the Project proceed, Sabina:

- Form a technical advisory group to provide independent advice on study design(s) and analyses for the testing and evaluation of the Project's adaptive management measures for reducing disturbance to caribou;
- Within the early stages of the Project (e.g., first five (5) years), undertake appropriate testing of the caribou detection methods, group size thresholds, and distance thresholds employed as recommended by the advisory group;
- On the basis of these tests, and any other available evidence, provide analyses and a written evaluation of the caribou protection measures and where appropriate make necessary adjustments to those measures; and
- Submit this report to NIRB, and other relevant parties, for review.[486]

In its response to the submission on the FEIS Addendum, Sabina agreed to the development of a Caribou Technical Advisory Group based on the proposed terms provided by the GN, and suggested that the Caribou Technical Advisory Group would consist of technical representatives from Sabina, the KIA, the GN, and the GNWT. Sabina also highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing. During the supplemental Final Hearing, Sabina further discussed the intended function of the Caribou Technical Advisory Group, and detailed how monitoring results, Inuit Qaujimajatuqangit, Traditional Knowledge, updates to scientific understanding, and direction from the NIRB during its Monitoring phase could trigger updates to the WMMPP through the life of the Project, as well as what review process Sabina would undertake with the Caribou Technical Advisory Group and other agencies to incorporate potential updates into the operational WMMPP.[487] During the supplemental Final Hearing, the GN indicated that its concerns related to the scope of the FEIS Addendum and the effectiveness of mitigation and adaptive management were addressed through Sabina's revisions included in Version 8 of the WMMPP.[488]

During the supplemental Final Hearing, the KIA requested that Sabina clarify the intended relationship between the Inuit Environmental Advisory Committee (IEAC) and the Caribou Technical Advisory Group,

[486] Government of Nunavut, Final Written Submission on the FEIS Addendum, NIRB File No. 12MN036, April 24, 2017.
[487] G. Sharam, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 184-185, lines 11-26 and 1-18.
[488] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 448-449, lines 26 and 1-16.

as well as how they would feed into each other and interact. In response, Sabina highlighted that within its draft terms of reference, the function of the IEAC would be to receive and consider project information that relates to environment and wildlife, to provide advice to Sabina and the KIA about potential wildlife or environmental impacts or concerns, and to hear and attempt to resolve concerns from community members related to environment and wildlife aspects of the Project. Sabina added that the Caribou Technical Advisory Group would have a more technical advisory function and would be more scientifically-based, potentially staffed by biologists, and would include representatives from various groups. Sabina noted that although some objectives and details still require further development with government agencies and the KIA, it anticipates the two (2) groups would overlap in their functions, where the IEAC would be focussed on community knowledge and information on monitoring aspects, and the Caribou Technical Advisory Group would function on a higher level involving technical research and monitoring.[489] During the supplemental Final Hearing, the KIA commented that the draft IEAC terms of reference filed by Sabina are only illustrative of potential future terms of reference, and would not necessarily be the terms of reference for the IEAC within the Inuit Impact and Benefit Agreement (IIBA) for the Project. The KIA further noted that in its view all environmental monitors for the Project would be Kitikmeot Inuit.[490]

The KIA requested that Sabina provide further clarification regarding the Caribou Technical Advisory Group and its prospective membership and questioned why the GNWT, as a party without legal or regulatory responsibilities in Nunavut, would be involved in the group in place of wildlife organizations created under the *Nunavut Agreement*. The KIA suggested that while the GNWT and the GN collaborate on caribou surveys and related scientific studies, this function within the group could be fulfilled by the GN directly. In response, Sabina highlighted that the preliminary concept around membership to include the three (3) parties leading the technical review, though a finalized participation list, outside of the GN, had not been developed. Sabina acknowledged the GNWT's involvement with range planning associated with the Bathurst caribou herd, and noted that it would be cautious to make the group as inclusive as possible. Sabina added that the Kitikmeot Wildlife Management Board or the Nunavut Wildlife Management Board could participate in the committees, although it would look to the KIA and the GN as the primary parties for the development of the group.[491] The KIA further requested that Sabina clarify that the WMMPP would be a living document and the established committees would be developed in a way that works best for Inuit and for caribou management in relation to the Project. In response, Sabina agreed with the KIA's statement and added that it would want to ensure that the committees would be flexible and developed collaboratively.[492]

During the supplemental Final Hearing, the KIA noted that it welcomes a new working relationship with the GN and Sabina and possibly other Nunavut organizations through the Caribou Technical Advisory Group, as long as it does not interfere with the KIA's IIBA, however, the KIA noted that it did not agree that parties outside of the jurisdiction of Nunavut should be part of the technical group.[493]

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[489] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 221-223, lines 24-26, 1-26, and 1-18.

[490] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 433-434, lines 26 and 1-12.

[491] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 223-225, lines 22-26, 1-26, and 1-13.

[492] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 225-226, lines 15-26 and 1-9.

[493] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017 p. 434, lines 13-22.

During the supplemental Final Hearing, Board staff questioned Sabina on what specific steps it would undertake to ensure that its planned advisory groups are effective and responsive as possible throughout the operational life of the mine. Board staff further requested that Sabina highlight working models from other mines in Nunavut that it may have based its model on. Sabina noted in response that the Mary River Mine has a similar model, although the Mary Rive Mine's advisory groups tend to be merged as opposed to separate entities. Sabina reiterated the draft terms of reference developed for the IEAC, and suggested that a first step for the Caribou Technical Advisory Group would be to develop refined terms of reference with objectives, meeting methods, and participants. Sabina noted that the key for the effectiveness of the groups is to establish what their functions are, how they can perform their functions, and how to move forward. Sabina reiterated that the advisory groups would be living groups, and suggested that they would adapt as they assume their independent and collaborative roles. Sabina further reiterated its commitment to ensuring that the groups would have the required resources, site access, and data in order to provide feedback to Sabina and the NIRB as part of its review of the WMMPP.[494]

During the supplemental Final Hearing, Board staff requested that the GN clarify whether, recognizing it was the GN's recommendation that a Caribou Technical Advisory Group be established, it had envisioned the GNWT having a specific role in the group.[495] In its initial response, the GN noted that its vision for the group was to be a collection of renowned and well-versed experts in caribou-related issues. The GN added that while the membership of the group has not been finalized, the intention was to create a group very knowledgeable around caribou specifically related to the Project, with the potential for using its development and function as a model for further collaboration on other projects in the future.[496] The GN clarified through a deferred response that in recommending the establishment of the Caribou Technical Advisory Group, it envisioned that a panel of technical advisors would be assembled to provide a transparent mechanism for the testing and evaluation of the Project's caribou monitoring and adaptive management measures.[497] The GN further clarified through an additional deferred response that in making its recommendation for the development of the group, it assumed that the GN, the KIA, and Sabina would each provide members, and that other members would be added as required to provide necessary expertise. The GN noted that although it did not specifically recommend the GNWT's membership in the group, given the GNWT's technical expertise and shared responsibility for the monitoring and management of the Bathurst and Beverly herds, there would be a clear logic and sound rationale for the inclusion of GNWT technical staff on the advisory group.[498]

Through their final written submissions on the FEIS Addendum, the KIA, GN, GNWT, and the NSMA provided comments related to the need for a defined concept of caribou 'group size' to trigger mitigation measures. The KIA noted in its discussion that the definition of a "group" should not be left up to interpretation and should be strengthened to reduce outstanding uncertainty related to the

[494] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 249-251, lines 25-26, 1-26, and 1-13.
[495] R. Barry, Board staff, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 464-465, lines 24-26 and 1-7.
[496] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 465, lines 9-19.
[497] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 557, lines 4-16.
[498] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 898-899, lines 10-26 and 1-2.

application of mitigation measures on-site. The GN expressed similar concerns, and noted that the term 'group' is not defined in the WMMPP with reference to caribou. The GN further added that the manner in which a group of caribou is defined could have significant consequences for how and when caribou group protection measures are implemented. The GNWT recommended in its submission that to account for the variation in how observers might define a caribou 'group', it would like to revise its previous recommendation to establish triggers based on total number of caribou within the buffer, as opposed to caribou group size. The GNWT discussed how misinterpretation could affect group size interpretations in various scenarios, such as the triggering of mitigation for groups of 30, as well as 250 to trigger rapid operational shutdowns. The NSMA also noted in its submission on the FEIS Addendum, and during the supplemental Final Hearing, a lack of clarity in how a 'group of animals' is defined in the WMMPP, and how a definition could influence the implementation of mitigation measures. The KIA recommended that to avoid subjectivity related to the differentiation between caribou groupings, Sabina could adopt the following definition:

> A group of caribou is defined as an aggregation of caribou that are sufficiently close together that they can see and react to another animal's behaviour, and have the potential of responding should one or more animal in the aggregation become startled.[499]

In its response to final written submissions on the FEIS Addendum, Sabina committed to incorporating the KIA's recommended definition into the WMMPP. During the supplemental Final Hearing, Sabina further committed to study caribou group sizes that are representative of the herds interacting with the Project during summer and fall seasons in the first three (3) years of the Project's life. This data would be used to update staged reduction protocols in the WMMPP in collaboration with the Caribou Technical Advisory Group.[500]

During the supplemental Final Hearing, the KIA clarified that the definition of caribou group was:

> *…developed as the most protective and implementable definition of a "group" without resorting to broad definitions that incorporate vast areas of land around the project site which may not qualify certain gatherings of caribou as "groups." Enforcement of this definition will require trained wildlife personnel and will allow for better recognition of caribou groups in the field.*[501]

The KIA acknowledged its comment as resolved with Sabina's commitment to update the WMMP with its recommended definition.[502] The GN also indicated that it considered this issue addressed based on Sabina's responses and commitments.[503]

Within their final written submissions related to the FEIS Addendum, the KIA, GN, GNWT, and the NSMA commented on the need for additional rationale to qualify the use of aggregations of 30 and 250 caribou to trigger mitigation and adaptive management within the WMMPP. Within its submission, the KIA

[499] Kitikmeot Inuit Association, Final Written Submission on the FEIS Addendum, NIRB File No. 12MN036, April 24, 2017.
[500] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[501] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 430, lines 8-15
[502] Kitikmeot Inuit Association, supplemental Final Hearing Presentation, NIRB File No. 12MN036, Exhibit 46, June 1, 2017.
[503] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 453, lines 7-14.

noted that very few caribou in groups of 30 or more are typically present during the summer period when the Beverly/Ahiak herd would interact most with the Project. The KIA acknowledged that few studies have looked at group size aggregates over time and population size in caribou, however, the KIA identified studies conducted on caribou herds in other jurisdictions that found that the use of 30 caribou as a management trigger would capture the minority of caribou groups, and that caribou can be said to, with the exception of sporadic large groups, use areas as many small groups. The KIA further referenced studies which found that group sizes, and the tendency of caribou to form dense aggregations into smaller groups, can vary greatly within and across seasons and years.

The GN expressed similar concern within its submission, noting that the effectiveness of the Project's proposed caribou protection measures would depend greatly on the relevance of the group size thresholds, and elaborated that thresholds set too high would result in the infrequent application of mitigation measures, while thresholds set too low may exceed the protection necessary to reduce potential impacts, thus restricting the operation of the Project. The GN added that the FEIS Addendum and the WMMPP do not provide data, evidence, or clear rationale to support the selected group size thresholds, which makes it difficult to assess whether the caribou protection measures would be effective. The GN provided an analysis of data contained within the FEIS and noted that using incidental and aerial survey observational data of caribou collected during baseline studies, all groups observed during spring migration, calving, and post calving were below the 30 caribou threshold and would not have triggered enhanced mitigation, though the number of observations during these periods was acknowledged as being small. During the summer period when the greatest number of observations were made, and the season of greatest interaction between the Project and caribou, the GN noted that 83% of the observed groups were below the group threshold of 30 caribou, and would not have triggered enhanced mitigation. The GN noted that the remaining 17% were above the 30 group threshold and accounted for 78% of the total number of individuals observed during the summer, but were below the 250 grouping threshold. Based on results from the remote camera studies, the GN noted that although limited observations occurred during the spring, calving and post-calving periods, 18 of the 19 groups, comprising 49% of total individuals observed, would be below the 30 caribou threshold and would not have triggered enhanced mitigation. The GN further highlighted that during the summer and fall, 96% and 97% of caribou groups, respectively, were less than 30 individual caribou and also would not have triggered enhance mitigation. The GN highlighted that group sizes derived from incidental observations were not considered due to the potential for observational biases, and also acknowledged biases that could be present in other studies, such as remote camera studies, in under or over-representing caribou groups based on limited field of view. The GN concluded that depending on the source of data used, a threshold of 30 or more caribou would provide protection to between 44% and 70% of caribou, while a group size of 20 would protect between 50% and 80% of caribou. The GN recommended that Sabina revise the WMMPP to present evidence and clear rationale to support its group size thresholds in order to improve confidence in the protective nature of the WMMPP and the feasibility of implementing its management measures throughout operations.

Within its final written submissions on the FEIS Addendum, the GNWT highlighted data on the George River caribou herd, which it noted was consistent with its aerial survey findings, where seasonal average caribou group sizes ranged from 1.5 to 38.2, with average groups often below 10 or individual caribou. Based on the data it analyzed, the GNWT added that group sizes over 30 caribou were only seen during insect season, although in its experience these larger group sizes rarely last more than a day, and otherwise caribou are often scattered within groups commonly less than 10.

Both the GN and the GNWT discussed the use of the 250 caribou aggregation to trigger rapid operational shutdowns during calving, post-calving seasons, and early summer. Within the baseline data it analyzed, the GN commented that the threshold of 250 caribou to trigger mitigation during calving, post-calving, or early summer would not trigger mitigation based on the caribou group sizes revealed in the Project's baseline data. The GN further noted that a recent study of the Beverly calving grounds recorded caribou groups ranging in size from one (1) to 165 individuals, with mean groups ranging from nine (9) to 21 individuals. The GN identified that groups of 250 were not identified in the study, which suggests that the 250 threshold would not serve as a sensitive trigger and should be re-evaluated. The GNWT highlighted findings from its recent Bathurst caribou herd calving ground survey, which divided the main concentrations of calving caribou into three (3) classes: low (one (1) caribou/square kilometre [km^2] or less), medium (one (1) to 9.9 caribou/km^2), and high (more than 10 caribou/km^2). The GNWT indicated that only two (2) segments of the study revealed high density of caribou, 39 revealed medium density, only seven (7) of which had four (4) or more caribou/km^2. The GNWT noted that the equivalent caribou density trigger proposed by Sabina to initiate rapid operational shutdowns (4.2 caribou/km^2) would only be triggered if the highest density of calving caribou were on the project site, and that lower and most medium densities would not trigger mitigation.

Both the GN and the GNWT provided several recommendations regarding thresholds and triggers for the application of mitigation measures during operations and during rapid operational shutdowns. The GN recommended that Sabina consider alternative triggers, which could include the use of a 30 caribou threshold observed during calving or post-calving, supplemented with collar data, or the use of a density threshold rather than an absolute number. In this scenario, the GN suggested that triggering rapid operational shutdowns based on the observation of 125 to 300 caribou within four (4) km of the Project would be equivalent to the densities observed within the Beverly caribou herd's core range. The GN added that to improve confidence and feasibility of the WMMPP, Sabina should revise the WMMPP to present evidence and a clear rationale to support the caribou threshold that would trigger a rapid operational shutdown. The GNWT noted that it did not agree that the proposed heavy equipment cessation trigger of a group of 250 caribou entering the four (4) km trigger distance for calving, post-calving, and early summer would be sufficient to avoid sensory disturbance and recommended that all on-site traffic, including light vehicles, be suspended if 30 caribou entered the four (4) km trigger during these periods. Similarly, the GNWT recommended that due to the unlikely occurrence of 250 or more caribou, and the subjective interpretation of what constitutes a "group" of caribou, Sabina should use a lower density of caribou, or a total number of caribou, as a trigger. The GNWT also recommended that Sabina adjust its criteria for the resumption of activities during rapid operational shutdowns and noted its prior recommendation that Sabina apply the threshold of 25 animals for the cessation of blasting and all on-site traffic during the calving, post-calving and early summer.

In its response to these final written submissions on the FEIS Addendum, Sabina discussed its rationale for selecting 30 caribou as a trigger for mitigation, as well as improvements made to the WMMPP to-date. Sabina indicated in its responses that as part of the DEIS and FEIS, WMMPP Versions 1 and 2 were based on triggers for groups of 50 caribou within a distance of two (2) km, one (1) km, 500 m, or 250 m, depending on the activity, and determined group size based largely on the presence of females with calves, not male groups. Sabina discussed consultations it had with the KIA, GN, and the GNWT throughout NIRB technical commenting periods and prior to the 2016 Final Hearing, during which parties recommended more conservative measures be applied for its group aggregations and distance thresholds, which resulted in the reduction of group size trigger from 50 to 30, and use of "any caribou" in its definition of caribou group instead of "predominantly females and calves". Sabina also noted that the intention of using a group size of 30 animals was to address the GNWT's prior concern that larger

groups (over 25) react more strongly to disturbances, and should one or more animals react to the disturbance, the other animals could react to the first animal's response. Sabina noted that it did not agree with the GNWT's recommendation of the 25 caribou threshold, as the 30 animal threshold reflected in the WMMPP is highly protective.

Sabina indicated that a group size trigger for additional management based on the 30 caribou trigger is protective of caribou based on current data, including data from seasons when caribou are most likely to interact with the Project. Sabina noted that based on aerial survey results conducted for the Project, 87% of caribou groups are in groups larger than 30, and of the groups less than 30, 91% were males or non-breeding female groups. Based on collar data around the time the aerial surveys were completed, Sabina indicated that these data were likely associated with the Beverly caribou herd. Sabina highlighted similar data it sourced from annual monitoring reports associated with the Ekati and Diavik mines (Northwest Territories), noting that, based on the data, 90.9% of caribou from the Bathurst herd are in groups of 30 or more during summer, and 90.4% of caribou are in groups of 30 or more during fall. Sabina concluded that it is confident that its proposed mitigation measures are protective of caribou given that, based on its analysis, 88% of caribou are in groups of larger than 30 animals, 91% of groups smaller than 30 caribou are males or non-breeders, and that it would have management measures in place for groups smaller than 30.

Sabina highlighted monitoring that would be in place to trigger operational shutdowns, including the use of satellite collar data, on-site cameras, and on-site wildlife monitoring for the initiation of rapid or planned operational shutdowns. Sabina indicated that during the 2016 Final Hearing, the threshold of 250 caribou within four (4) km to trigger rapid operational shutdowns was established through discussions with the KIA as a reasonable number which would indicate that the calving or post-calving range of a herd had shifted unexpectedly to cover the Project site. Sabina identified that this value was established by calculating the density of calving caribou recorded by government biologists in high density blocks, multiplied by the size of the area within four (4) km of the Project, which would be 60 km^2. Sabina identified values generated from GNWT reports of calving Bathurst caribou, which revealed densities of 6.76 caribou/km^2, and similar GN data which revealed densities of 6.0 caribou/km^2. Sabina analyzed that the referenced data would result in 405.6 caribou or 360 caribou in the 60 km^2 area around the Project, and highlighted that its use of a 250 caribou trigger is considerably less and would be an appropriate and protective value for triggering rapid operational shutdowns. Sabina committed to updating the WMMPP to trigger rapid operational shutdowns when 250 caribou occur within the project site, rather than a "group of caribou", as requested by the GN. Sabina further committed to revising its protocols for the resumption of activities during a rapid operational shutdown from resuming activities after one day, to discussing the resumption of activities with all appropriate regulators on a daily basis. Sabina concluded that by having multiple triggers in place to initiate rapid operational shutdowns, and with its commitment to create a Caribou Technical Advisory Group to discuss and review management measures and protocols, it has a robust plan to address any potential future shifts in calving or post-calving ranges. Sabina also highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing.

During the supplemental Final Hearing, Sabina committed to revise Version 8 of the WMMPP with additional details and measures related to wildlife mitigation and monitoring including the following:

- Reduction of the trigger for rapid operational shutdowns from 250 caribou within four (4) km of the Project (4.1 caribou/square kilometre [km^2]) to a density of two (2) caribou/km^2 within four (4) km of the Project during calving and post-calving periods;

- Reduction of the group size to trigger staged reductions in project activities from greater than or equal to 30 animals to greater than or equal to 25 animals;
- Commitments to study caribou group sizes during summer and fall seasons in the first three (3) years of the Project to update staged reduction protocols in the WMMPP in collaboration with the Caribou Technical Advisory Group, an updated threshold would be established to ensure that 75% of individuals would be subject to a Level 4 response;
- Reduction of the group size trigger for staged reductions during calving from greater than or equal to 30 caribou to greater than or equal to 10 breeding female caribou;
- Various other mitigation and monitoring measures; and
- Additional commitments to review various thresholds, monitoring, and mitigation measures with the Caribou Technical Advisory Group.[504]

During the supplemental Final Hearing, the GN noted that its concerns related to these issues were addressed based on Sabina's commitments to update its group size thresholds from 30 to 25 for staged reductions for all seasons except calving, and during calving to 10 breeding female caribou; to study group sizes and update management thresholds to ensure that staged reductions are triggered for 75% of caribou that interact with the Project; and to reduce its threshold for rapid operational shutdowns to two (2) caribou/km^2 within four (4) km of the Project during calving and post-calving, with period review of the measures through the Caribou Technical Advisory Group[505, 506]

During the supplemental Final Hearing the GNWT expressed concern regarding Sabina's proposed trigger adjustment to initiate staged reductions at 25 animals instead of 30. The GNWT noted that in its experience during aerial surveys, small group sizes are common and caribou are typically scattered. The GNWT referenced its supplemental final written submission on the FEIS Addendum where it highlighted a study on the George River caribou herd that identified average group sizes well below 10 animals. The GNWT acknowledged that this management criteria would be refined by the Caribou Technical Advisory Group, but expressed concern that the definition of group size could be subject to personal perception. In response, Sabina clarified that the GNWT requested a group size of 25 in a previous submission, but that a definition at the time was not requested, although a recommended definition proposed by the KIA has since been accepted.[507] Sabina noted that the trigger of 30 animals for the cessation of blasting or heavy equipment use was modified from its original proposed trigger of 50 animals within 2.5 km based on comments received from the GNWT that the number should be lower because animals in larger groups were thought to react more strongly than animals who are single animals or in very small groups. Sabina clarified that through discussions with parties during the 2016 Final Hearing it agreed on a group size of 30 animals. Sabina clarified that the reasoning behind group size and definition considers the concept of animals responding to other animal's reaction if in view of each other. Sabina noted that the definition developed in collaboration with the KIA included the concept of animals able to see each

[504] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[505] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 450-451, lines 21-26 and 1-18.
[506] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[507] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 232-234, lines 21-26, 1-26 and 1-18.

other to address variable topography in the area and to delineate the concept that 30 caribou within a low area, or drainage, would be considered a group.[508]

During the supplemental Final Hearing, the NSMA requested that Sabina further discuss the topography of the project area and how caribou aggregations could be affected by valley-like landscapes. In response Sabina noted that in general the site consists of three (3) valley-like areas, and that mapping conducted in the area identified the most suitable locations for the proposed tower cameras so that monitoring could occur in each of the depressions.[509] The NSMA requested that Sabina further clarify how the trigger of 25 caribou would be applied if three (3) separate caribou groups of 24 caribou each were located in the separate valleys, and what responses would be triggered. In response, Sabina noted a similar scenario was discussed with the KIA, and that the concept of a hard number is required for the purpose of clarity within its plans, however, Sabina suggested that there is flexibility within the WMMPP in that the wildlife manager has the ability to shut down areas of the site based on feedback from monitors should they choose, and that a similar scenario would likely result in the cessation of activities in the project area. Sabina added that shutdowns of this nature would be reported as part of its annual reporting structure, along with data from the proposed high-powered monitoring cameras, and reiterated that Inuit and Northwest Territories Aboriginal wildlife monitors could relay information back to communities.[510]

During its presentation at the supplemental Final Hearing, the NSMA further requested that Sabina adjust the wording to allow a trigger for staged reductions based on the total number of animals observed within the trigger distance, as well as the group size. The NSMA noted its expectation that the Caribou Technical Advisory Group would be able to develop a reasonable value for a total caribou trigger.[511]

During the supplemental Final Hearing, the GNWT requested that Sabina clarify its rationale for adjusting the trigger for rapid operational shutdowns to a density of two (2) caribou/km^2, including what the value is based on and how it arrived at that number. In response Sabina identified that the original trigger of 250 caribou within four (4) km was established through a commitment made to the KIA during the 2016 Final Hearing, which equates to 4.1 caribou/km^2 or 4.2 caribou/km^2. Sabina noted that several conversations had taken place leading up to the supplemental Final Hearing regarding the appropriateness of the 4.1 caribou/km^2 density trigger to initiate rapid operational shutdowns should a low or moderate density area a calving ground overlap with the Project. Sabina added that although no distinct values were identified in its analysis of data, through consultation with the GN it was identified that over 90% of caribou would be in areas of higher density, which led to the established updated value. Sabina noted that the density value could be further discussed and updated through the Caribou Technical Advisory Group in the future.[512] The GNWT noted in response that it appreciates Sabina's adoption of more conservative thresholds, however, suggested that a lower density of one (1)

[508] G. Sharam, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 234-235, lines 19-26 and 1-25.
[509] G. Sharam, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 243-244, lines 5-26 and 1-2.
[510] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 244-245, lines 16-26 and 1-26.
[511] S. Shiga, North Slave Métis Alliance, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 611-612, lines 22-26 and 1-21.
[512] G. Sharam, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 236-237, lines 18-26 and 1-23.

caribou/km^2 be applied to reflect definitions the GNWT uses during its calving ground surveys. The GNWT further explained that it considers one (1) caribou/km^2 or less low density, between one (1) caribou/km^2 and 10 caribou/km^2 medium density, and over 10 caribou/km^2 high density.[513] In response, Sabina reiterated that based on the data it assessed, the value of two (2) caribou/km^2 would protect roughly 98% of caribou in calving grounds and that it considers the value extremely protective towards caribou. Sabina commented that the values assigned by the GNWT for aggregations of caribou are arbitrary and are not necessarily representative of caribou in the field. Sabina further highlighted that its commitment would be new to mines in Nunavut and the Northwest Territories, that it has confidence that the value chosen would protect 98% of calving caribou, and that a lower value would be overly restrictive.[514]

During its discussion at the supplemental Final Hearing the GNWT identified, but did not develop further, its observations that the calving area of the Bathurst caribou herd appears to be diminishing in size, with a concentration of individuals in a smaller area than observed previously.[515]

In its final written submission on the FEIS Addendum, the GN and the NSMA commented on Sabina's proposed management measures related to the proposed planned operational shutdowns in response to calving and post-calving caribou ranges shifts. The GN highlighted discrepancies within the WMMPP where contradictory language was used which result in uncertainty as to whether measure would apply only to the Bathurst herd and not Beverly, and only in response to calving range shifts and not post-calving. The GN requested that Sabina resolve the discrepancies and clarify that range monitoring and operational shutdown provisions within the WMMP would apply to both the calving and post-calving ranges of the Bathurst and Beverly/Ahiak herds as per commitments made during the 2016 Final Hearing. The GN also identified the need for additional rationale to support the use of the 50% and 80% core range overlaps required to trigger operational shutdowns, as well as how the operational shutdowns would differ depending on two overlap thresholds. The GN further identified the need for more clarity around management response measures that would be employed in the event of range overlaps, regardless of the outcome of consultations Sabina has committed to within the WMMPP. Based on the concerns identified, the GN recommended the following:

- Clarify that range monitoring would occur for both calving and post-calving ranges of the Bathurst and Beverly/Ahiak herds;
- Clarify that overlaps of 50% or 80% calving or post-calving ranges for Bathurst or Beverly/Ahiak herds would trigger planned operational shutdowns;
- Specify measures that would be employed as part of a planned operational shutdowns for 50% calving or post-calving range overlaps, regardless of the degree of overlap;
- Clarify aspects of a planned operational shutdown that may vary yearly based on the degree of overlap with 50% or 80% core ranges;
- Identify results of consultation with the GN, KIA, and other stakeholders related to planned operational shutdowns that may vary year to year; and

[513] J. Adamczewski, Government of the Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 238, lines 2-20.
[514] G. Sharam, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 238-239, lines 23-26 and 1-21.
[515] J. Adamczewski, Government of the Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 239-240, lines 24-26 and 1-7.

- Specify that any degree of overlap between the Project and 80% core calving or post-calving range of the Bathurst of Beverly/Ahiak caribou herd is sufficient to trigger a planned operational shutdown.

Similarly, the NSMA requested that Sabina provide a synopsis of the analysis method for caribou calving and post-calving range shifts and how overlapping area is determined, and that it clarify that the intent of maintaining mill operation during Level 5 and Level 6 shutdowns is to prevent the facility from being damaged.

In its response to these final written submissions on the FEIS Addendum, Sabina agreed with the GN's recommendations and committed to updating the WMMPP to address the GN's concerns related to planned operational shutdown measures. Sabina highlighted that in its opinion, planned operational shutdowns would be the most conservative mitigation and management measures ever proposed in Nunavut, which would be triggered following the analysis of satellite collar data to identify calving or post-calving range overlaps with the Project. Sabina clarified that should a previous year's analysis reveal calving or post-calving overlaps with the Project, measured as 50% or 80% kernel density, it would approach the KIA, GN, and the GNWT with its plan for the shutdown, which it noted would include a range of mitigation measures including a reduction in on-site workforce; cessation of open pit and other surface blasting; cessation of open pit activities; cessation of underground activities; cessation of heavy equipment on surface; cessation of all helicopter usage; reduction in mill operations; and the reduction or cessation of various other mine functions except in emergency, personnel safety, or environmental compliance requirement situations. Sabina further committed to updating the WMMPP to clarify that planned operational shutdowns would be triggered should the core calving or post-calving range of either the Bathurst or the Beverly/Ahiak caribou overlap the Project site, to clarify collaboration it would undertake with the Caribou Technical Advisory Group, and to clarify how potential changes to planned operational shutdown protocols would be assessed through the Caribou Technical Advisory Group, and circulated to regulators and submitted to the NIRB prior to implementation. Sabina also highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing.

In response to the NSMA request for clarification regarding mill operational protocols during Level 5 (rapid operational shutdowns) and Level 6 shutdowns (planned operational shutdowns), Sabina confirmed that the intent of maintaining mill operation during Level 5 shutdowns would be due to prevent damage to the mill, and Level 6 shutdowns would occur in the years following unexpected shifts in calving or post-calving ranges and would include time to plan for more substantial cessation of works, including partial shutdown of the mill. During the supplemental Final Hearing, Sabina submitted a document that contained commitments to revise Version 8 of the WMMPP with additional details and measures related to wildlife mitigation and monitoring including the removal of herd vulnerability from the description of planned operational shutdown.[516]

During the supplemental Final Hearing the GN indicated that it considered this issue addressed based on Sabina's responses and commitments.[517]

[516] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[517] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 452-453, lines 14-26 and 1-6.

During the supplemental Final Hearing the NSMA noted the importance of Level 5 and Level 6 shutdowns for the NSMA and thanked Sabina for incorporating the measures within the WMMPP. The NSMA acknowledged that precise triggers would be established through the proposed Caribou Technical Advisory Group, and requested that a conservation definition of overlap be used to set triggers for the two (2) levels of protection. The NSMA further requested that Sabina investigate new technologies or techniques to shut down the mine plant in the event of a Level 6 shutdown.[518]

Within its final written submission on the FEIS Addendum the GN and the GNWT commented on the series of distance thresholds that were established by Sabina within the WMMPP as part of its management measures to mitigate impacts from activities considered to be most disturbing to caribou, such as blasting, heavy equipment operations, and helicopter operations. The GN acknowledged that although the distance thresholds within the WMMPP were increased relative to earlier versions, it has concerns regarding the adequacy of the distance buffers based on several factors including:

- The potential underestimation of disturbance effects on caribou from the use of literature review findings for wildlife behavioural responses from stimuli such as over flying aircraft and road traffic, and potential biases in behavioural response studies;
- The need for a precautionary approach in estimating the range of ZOIs from the Project based on the interactive effects that could result from a multitude of human activities on-site, and their associated potential impacts on wildlife regardless of operational scale;
- The need for a balanced approach to establishing distance thresholds which consider both behavioural studies as well as ZOI studies; and
- The need for a precautionary approach, which would involve the establishment of thresholds greater than may be needed, which could be reduced based on evidence gathered through monitoring.

The GN discussed relevant literature and noted that Sabina's reliance on behavioural studies to establish distance buffers may result in thresholds that are not conservative and could have unexpected consequences on caribou; that the literature review used by Sabina to justify the 96 decibel (continuous; dBA) threshold relied on a comparative review of ungulate, including caribou, responses to a variety of noise stimuli, such as aircraft, but not events such as open pit blasting, and does not consider studies which suggest that caribou could respond to noise below 96 dBA; and that the current blasting procedures do not account for the potential movement of caribou into the mitigation trigger range should charges be set. The GN expressed concern regarding the proposed distance thresholds for the operation of heavy equipment and noted that the established threshold may not be sufficient due to:

- The reliance on behavioural studies;
- The literature reviews used by Sabina examined caribou responses to light vehicles and not disturbance from heavy equipment;
- Available data showing that caribou respond to anthropogenic noises, but are typically more sensitive to visual stimuli and that at four (4) m in height and heavy equipment would likely be visible to caribou from a distance greater than 500 m or one (1) km;

[518] S. Shiga, North Slave Métis Alliance, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 612-613, lines 22-26 and 1-20.

- Available data on ZOIs around roads showing evidence of varied caribou responses depending on levels and types and traffic, surrounding habitats, and species, and that the studies suggest that responses to vehicles can occur over distances greater than 500 m or one (1) km; and
- That a study of caribou movement within 15 km of a mine found significant effects on migratory movements of caribou, even at low to moderate rates of traffic.

The GN commented that the proposed distance buffers for helicopters are reasonable, but that helicopter take-off procedures should be clarified to suspend flights if distance buffers cannot be maintained.

To address its concerns, the GN recommended that Sabina revise the WMMPP to clarify helicopter suspension protocols during take-off when buffers cannot be maintained; increase the blasting cessation threshold for groups of 30 or more caribou to five (5) km during calving, post-calving, and summer, as well as increase distances to account for lag time between charge setting and blasting events; and increase stoppage distances to 1 km for heavy equipment operations during summer to ensure greater protection during sensitive seasons, as well as periods when greatest interactions between caribou and the Project would occur.

In its response to the GN's final written submission on the FEIS Addendum, Sabina committed to updating the WMMPP to address buffers for helicopter engine start and take-off protocols, and noted that the heavy machinery buffer was already set at one (1) km during early summer, as requested by the GN. Sabina indicated that it did not agree with the recommended five (5) km blasting buffer, and highlighted that the blasting buffers had already been extensively discussed and agreed upon by parties. Sabina provided a summary of the discussions conducted to-date for the establishment of the four (4) km blasting buffer, which included discussions prior to and during the 2016 Final Hearing with the KIA, GN, and the GNWT. Sabina indicated that to meet commitments it made through a joint submission with the KIA and to address concluding statements submitted by the GNWT and the NSMA at the 2016 Final Hearing, it opted to use a four (4) km buffer to increase conservatism in its approach to blasting mitigation. Sabina highlighted several instances where parties and/or community groups and members did not challenge the updated four (4) km buffer through subsequent consultations and technical reviews, and further highlighted that during a workshop it held in October of 2016, the GN stated that they would not pursue requests for an additional buffer area. Sabina noted that it and other regulatory bodies have agreed that the proposed trigger distance for blasting is suitable for the Project, that the four (4) km blasting buffer and the WMMPP represent the most conservative and protective wildlife management plan in the Canadian Arctic, and that its commitment to establish a Caribou Technical Advisory Group, as requested by the GN, would guide adaptive management to limit potential effects to caribou. Sabina also highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing.

The GNWT noted in its submission on the FEIS Addendum that the four (4) km trigger distance during calving, post-calving, and early summer it previously recommended for all on-site traffic was not applied in the revised WMMPP. In response to the GNWT's submission, Sabina noted that it agreed to the setback distance of four (4) km for select project activities based on requests by the KIA and the NSMA, and that it does not agree with the four (4) km threshold for all on-site traffic. Sabina highlighted three (3) forms of traffic management for caribou that would be in place at the Goose Property including reporting, speed reductions, and movement cessation protocols based on trigger distances recommended by the GN and KIA following the 2016 Final Hearing; staged reduction protocols for

various project operations and activities using trigger distances recommended by the KIA following the 2016 Final Hearing; and rapid operational shutdowns triggered by collar data and observational monitoring. Sabina commented that stopping all traffic should 30 caribou be within four (4) km, as requested, would be overly restrictive and that there is little evidence from comparable roads which demonstrate that caribou react negatively to vehicles on project roads. Sabina reiterated findings from noise modelling conducted for the Project that indicated that noise from heavy trucks would reach the night time human noise guideline developed by Environment Canada within 50 m of the roads, and reiterated monitoring programs it would be conducting to adaptively manage impacts from project activities, including traffic. Sabina further reiterated its commitment for the creation of a Caribou Technical Advisory Group and noted that should monitoring results determine that caribou are reacting to vehicles, the Caribou Technical Advisory Group (including the GNWT) would be involved in the analysis of these data and the adaptive management response.

During the supplemental Final Hearing, Sabina submitted a document that contained commitments to revise Version 8 of the WMMPP with additional details and measures related to wildlife mitigation and monitoring, including reduction of the group size trigger for staged reductions during calving from greater than or equal to 30 caribou to greater than or equal to 10 breeding female caribou; increasing the setback distance for cessation of blasting from four (4) km to five (5) km during calving; increasing the trigger distance for stoppage of heavy mobile equipment during summer from 500 m to 750 m, excluding equipment that is obscured from view by caribou; as well as additional commitments to review various thresholds, monitoring, and mitigation measures with the Caribou Technical Advisory Group.[519]

During the supplemental Final Hearing, the GN noted that its concerns related to blasting and heavy equipment operation distance buffers for the protection of caribou were resolved by Sabina's commitment to revise the WMMPP to increase the trigger distance for the stoppage of heavy mobile equipment during summer, August 1 to August 31, from 500 m to 700 m, excluding equipment that is obscured from view by caribou, and increase the setback distance for the cessation of blasting from four (4) km to five (5) km during calving, June 5 to June 15.[520, 521] The NSMA noted in its final written submission on the FEIS Addendum that the trigger distances set in the WMMPP related to surface blasting, heavy equipment operation at site, and other response triggers were reasonable.

Another issue discussed in depth among parties and with Sabina was the proposed winter ice road and its relation to caribou. In its final written submission on the FEIS Addendum, the GN commented on outstanding issues related to the proposed winter ice road and its operation. The GN noted that Sabina has been responsive to issues the GN raised during past commenting periods and during the 2016 Final Hearing, and that the Sabina has clarified anticipated traffic levels on the winter ice road and how these were considered in the effects assessment. The GN acknowledged that the revised WMMPP contained enhanced mitigation and management measures for the operation of the proposed winter ice road including vehicle convoying protocols; potential road closure protocols during wildlife interactions; seasonal operational closures to avoid wildlife interactions; distance thresholds for speed reductions and stoppages when caribou are observed; and various monitoring measures to detect caribou

[519] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[520] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 450, lines 5-20.
[521] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.

interaction with the winter ice road. The GN identified, however, that it has several outstanding concerns related to the winter ice road related to the following:

- Concerns that the proposed winter ice road may act as a semi-permeable barrier to wildlife based on recent studies which identified disturbance to caribou movement at traffic levels as low as two (2) to three (3) vehicles per hour, particularly during winter, and a separate study that identified disturbance in caribou road crossings at traffic rates of four (4) vehicle passages per hour;
- Concerns regarding the inclusion of "unforeseen logistical reasons" in the WMMPP to qualify the continued operation of winter ice road beyond the proposed seasonal closure date of April 15;
- Uncertainty regarding the application of temporary winter ice road closure measures should the winter ice road operate beyond April 15;
- Concerns that the distance thresholds for winter ice road vehicle stoppages and speed reductions are too short; concerns that the methods of caribou observation along the winter ice road during potential operations beyond April 15 do not provide sufficient technical details to determine effectiveness; and
- Concerns that the monitoring of effects on caribou movement and distribution appear to apply only to the Goose Property, and not the winter ice road.

The GN provided various recommendations to Sabina including monitoring protocols for all forms of vehicle traffic along the winter ice road with commitments to undertake a revised impact assessment should traffic rates exceed those used in the FEIS for three (3) consecutive years; a more defined seasonal operational cut-off date of April 15, with the development of specific circumstances that may qualify as "unforeseen logistical reasons" by the NIRB in consultation with Sabina and parties; a set of criteria for triggering temporary closure of the winter ice road in response to monitoring results; additional details regarding the proposed ground-based surveys that would be conducted along the winter ice road to detect caribou; and the inclusion of monitoring for potential ZOI effects and disruption to caribou movements in relation to the winter ice road within the WMMPP if suitable data are available.

In its response to the final written submission related to the FEIS Addendum, Sabina agreed to incorporate the GN's recommendations into the WMMPP and provided an outline regarding the updated, revised, and/or additional information to be included in the WMMPP related to traffic monitoring on the winter ice road and criteria for additional road effects studies on caribou; clarified seasonal winter ice road closure timing, circumstances considered "unforeseen logistical reasons" such as poor weather, late winter freeze or thaw, mechanical failures, accidents, or other unforeseen events, and commitments to consult with the KIA and GN during potential operational extensions; additional detail related to temporary winter ice road closure triggers based on monitoring results; additional detail related to monitoring methods to trigger mitigation; and commitments to conduct separate studies for the Goose Property and winter ice road as part of its regional collar monitoring program, contingent on the availability of sufficient collar data for the winter ice road. Sabina also highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing. During the supplemental Final Hearing, Sabina also submitted a document which contained commitments to revise Version 8 of the WMMPP with additional details and measures related to wildlife mitigation and monitoring including a commitment to produce a Winter Road Schedule each year of

winter ice road operations, as well as additional commitments to review various thresholds, monitoring, and mitigation measures with the Caribou Technical Advisory Group.[522]

During the supplemental Final Hearing the GN noted that its concerns related to winter ice road and its operation were addressed through revisions contained within Version 8 of the WMMPP.[523]

During the supplemental Final Hearing the BHTO requested that Sabina clarify whether the April 15 operational closure date for the winter ice road would change if operational demands were to increase in the future. In response, Sabina confirmed that the planned shutdown of April 15 would remain as the planned shutdown date for the winter ice road, unless unusual circumstances should arise. Sabina clarified that its maximum requirements would have the road operating for 10 to 12 weeks at a capacity of 2,100 trucks per year. Sabina highlighted in comparison that the Tibbit to Contwoyto Winter Road operates for eight (8) to 10 weeks with over 10,000 trucks. Sabina also committed to provide the Caribou Technical Advisory Group with a planned operational schedule for the winter ice road each year for review, which would include yearly building, operational, and closure plans prior to construction.[524]

In its final written submission on the FEIS Addendum, the GN commented on outstanding concerns related to the proposed aircraft operations and associated air traffic rates. The GN highlighted where Sabina was responsive to concerns the GN expressed during earlier stages of the Review, and noted that relative to earlier versions of the WMMPP, the updated aircraft management measures provide increased protection for wildlife. However, the GN noted concerns regarding fixed wing aircraft distance buffers from wildlife during take-off or landing; helicopter distance buffers for caribou under groups of 30; aircraft suspensions triggers based on caribou group-size thresholds; and the potential for increased effects on wildlife if air traffic rates for the Project exceed those modelled in the FEIS. The GN recommended that Sabina insert a mandatory term for the reassessment of potential impacts on wildlife in the event that the Project's use of aircraft exceeds the conservative levels of traffic modelled in the FEIS.

In its response to the final written submissions on the FEIS Addendum, Sabina agreed to record the number and type of aircraft that would visit the site during the life of the Project, with associated reporting to the NIRB, and further agreed to the GN's recommendation that should air traffic levels exceed those used in the FEIS in each of three (3) consecutive years, and if deemed required by the NIRB, it would conduct an assessment of air traffic effects on caribou for the NIRB's review. Sabina identified the sections it would update within the WMMPP related to aircraft monitoring, triggers for aircraft monitoring, and triggers for adaptive management.

During the supplemental Final Hearing, the GN stated that its concerns related to air traffic operation and traffic rates were addressed through revisions Sabina included in Version 8 of the WMMPP.[525]

[522] Sabina Gold & Silver Corp., Exhibit 18, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.
[523] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 448-449, lines 26 and 1-16.
[524] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 231-232, lines 3-26 and 1-5.
[525] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 448-449, lines 26 and 1-16.

In its final written submission on the FEIS Addendum, the GN commented on Sabina's proposed regional monitoring program using motion-triggered cameras, and noted that the WMMPP provides limited information on the design of the camera study, but does make a commitment to undertake power analyses to ensure that sampling is sufficient. The GN highlighted that although the spatial distribution of cameras relative to the Project is discussed, the Project's ZOI may be generated but multiple factors, including wind, which could carry sound greater distances down-wind, and consequently create an asymmetrical ZOI with a greater spatial extent down-wind. The GN recommended that in designing the camera study, the array of cameras should be oriented with reference to prevailing winds, known to be predominantly west and northwest. The GN noted that camera transects should be oriented along the down-wind gradient to document the maximum effect of the ZOI and/or perpendicular to prevailing winds to control the effect. In its response to final written submissions on the FEIS Addendum, Sabina agreed with the GN's recommendation and committed to updating the WMMPP to include prevailing wind direction as a variable to be considered when installing cameras through its program. Sabina also highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing.

During the supplemental Final Hearing, the GN indicated that its concerns related to Sabina's regional monitoring program using motion-triggered cameras were addressed through revisions Sabina included within Version 8 of the WMMPP.[526]

In its final written submission on the FEIS Addendum, the GN and the GNWT commented on Sabina's proposed monitoring methods for detecting caribou near the Project. The GN noted that the effectiveness of Sabina's adaptive management system relies on the ability to detect caribou as they approach the Project at distances up to, and further than, four (4) km, which can be influenced by several factors including distance from the Project, caribou group size, weather conditions, as well how intensely monitoring occurs. The GN highlighted several uncertainties regarding the active caribou monitoring methods proposed within the WMMPP including:

- Limited details of the monitoring methods (timing, equipment used, frequency during peak interaction periods);
- Commitments to finalize plans in consultation with parties in place of providing basic details regarding number of observers and duration of observation during the Review phase;
- Uncertainty regarding the primary detection mechanism for caribou between the three (3) options proposed and uncertainty regarding the effectiveness of tower-mounted cameras as the preferred option; and
- Lack of information on the detection probabilities that may be achieved for each surveillance mechanism, how the probabilities change as a function of distance from the point of observation, and how this would influence monitoring methods with the goal of effective adaptive management.

The GN acknowledged that certain details of monitoring methods could not be provided at this stage of the Project's assessment, however, noted that the ability to evaluate the potential effectiveness of the proposed monitoring methods was limited based on the information provided. The GN urged that Sabina take caution in placing confidence in its proposed detection methods as a means to reduce

[526] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 448-449, lines 26 and 1-16.

sensory disturbance of caribou until additional evidence is available, and reiterated its previous recommendations regarding the formation of a technical advisory group to provide independent advice on study design(s) and analyses for the testing and evaluation of the Project's adaptive management measures for reducing disturbance to caribou, as well as other monitoring, collaboration, and reporting requirements. In its response to the final written submissions on the FEIS Addendum, Sabina agreed to the GN's reiterated recommendations for the formation of a Caribou Technical Advisory Group, as disused earlier in this section. Sabina also highlighted applicable proposed terms and conditions or commitments submitted during the 2016 Final Hearing.

During the supplemental Final Hearing, the GN noted that its concerns related monitoring methods for detecting caribou near the Project were addressed through revisions Sabina included within Version 8 of the WMMPP.[527]

The GNWT noted that while details on Sabina's "over the horizon" monitoring plans were not well defined, Sabina appeared to be working towards an innovative approach to addressing its prior recommendations. Based on the GNWT's comments Sabina considered the issue resolved, and provided an outline of how it added two (2) monitoring programs within the WMMPP which would be able to see further than ground-based observation which includes tower-mounted cameras, and the commitment to develop through the an "over the horizon" monitoring program, through the Caribou Technical Advisory Group, should further observational distances be required. Sabina also discussed other measures contained within the WMMPP which further speak to its monitoring plans and contingencies for "over the horizon" monitoring.

During the supplemental Final Hearing, the GN highlighted the Board's concern in the 2016 Final Hearing Report regarding Sabina's ability to maintain proposed mitigation protocols should extensive staged reduction events take place, and requested that Sabina discuss its confidence in its ability to carry out its commitments under the revised WMMPP considering that protection measures had been greatly enhanced since the 2016 Final Hearing.[528] In response, Sabina stated that it was confident in its ability to operate the mine under the agreed conditions, and acknowledged that it would likely have reductions in operating ability multiple days throughout the year. Sabina clarified that in assessing each aspect of the WMMPP and other commitments, it evaluated potential environmental, Traditional Knowledge, operational, and financial effects on the Project, and that the Project would have a profound socio-economic impact on the Kitikmeot region without any significant environmental impacts.[529]

During the supplemental Final Hearing, Board staff requested that Sabina clarify how weather conditions, such as fog or low cloud cover, would influence blasting activities and associated staged reductions. Sabina stated in response that the standard in Nunavut and the Northwest Territories is to use height-of-land-type surveys although they can be limiting in what you can see. Sabina noted that the proposed high-resolution, military-grade cameras would have increased capabilities, including extended observational ranges on clear days and infrared technology. Sabina reiterated that it would be monitoring the movement of caribou at all times to ensure that no caribou would be within the blasting

[527] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 448-449, lines 26 and 1-16.
[528] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 228, lines 3-19.
[529] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 229, lines 3-18.

threshold, and that if severe weather was encountered and it is not able to monitor for caribou, it would likely not blast and would further be subject to standard 500 m viewing safety requirements.[530]

During the supplemental Final Hearing, Board staff questioned Sabina on what contingencies would be in place should the proposed tower cameras need to be taken out of service for repair. Sabina highlighted in response that the three (3) proposed cameras would have overlapping effectiveness to cover portions of other monitoring areas, but also that height-of-land and observational blinds are also being proposed as part of its monitoring protocols. Sabina further noted that it would anticipate having backups on-site, or could fly backups in in quickly, and suggested that other monitoring measures would compensate during interim periods.[531]

In its final written submission on the FEIS Addendum, ECCC commented on the clarity of information presented within the revised WMMPP related to species at risk.[532] ECCC noted that in general it was satisfied with the mitigation and monitoring measures proposed to minimize impacts to species at risk, however, it identified that a specific section and table should be included in the WMMPP that clearly identifies species at risk and outlines how requirements under s.79 of the *Species at Risk* Act (SARA) would be met for all species at risk. ECCC discussed the Committee on the Status of Endangered Wildlife in Canada's November 2016 assessment of barren-ground caribou as threatened, which includes the Bathurst and Beverly/Ahiak herds, and the process being undertaken for the potential listing of barren-ground caribou under the SARA. ECCC recommended that species under consideration for listing under the SARA, as well as those designed as "at risk" by the Committee on the Status of Endangered Wildlife in Canada, should be considered during a project assessment in a manner similar to listed species under s.79 of the SARA. ECCC highlighted that the Bathurst and Beverly/Ahiak herds have been at the forefront of issues during the NIRB's Review, and as a result many of the expectations under s. 79 of the SARA have already been fulfilled. ECCC further recommended that Sabina consult the Species at Risk Registry to maintain current information in the WMMPP and associated reports, and recommended that the NIRB consult the GN on the adequacy of the mitigation and monitoring measures for barren-ground caribou.

In its response to the final written submissions on the FEIS Addendum, Sabina agreed to ECCC's recommendations and committed to including a new section within the WMMPP that would consist of a table listing federal and territorial species at risk and outlines how requirements under s.79 of the SARA would be met for each species. Sabina further agreed to update the WMMPP to include a provision to consult the Species at Risk Registry to maintain the most current information in the WMMP and the annual Wildlife Effects Monitoring Plan (WEMP) report. Sabina deferred ECCC's last recommendation to the NIRB, and highlighted that as part of the Review of the FEIS Addendum, the GN provided 12 comments on wildlife and vegetation, including 10 comments on mitigation and management directly or indirectly for caribou.

In its final written submission on the FEIS Addendum ECCC also commented on the revised Oil Pollution Emergency Plan (OPEP) included in Volume 10 of the Addendum and noted that it did not include details per Sabina's prior commitments to include necessary equipment for wildlife protection measures on site

[530] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 246-247, lines 9-26, and 1-19.
[531] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 247-249, lines 22-26, 1-26, and 1.
[532] Environment and Climate Change Canada, Final Written Submission on the FEIS Addendum, April 24, 2017.

and updating ECCC-CWS contact information. ECCC recommended that Sabina revised the OPEP to include details related to its prior commitments. In its response to ECCC Sabina agreed to ECCC's recommendations and committed to incorporating the details in an updated OPEP to be made available during the regulatory phase.

During the supplemental Final Hearing, ECCC noted it was satisfied with Sabina's responses and commitments and stated that it had no further concerns.[533]
In its final written submission on the FEIS Addendum, the Burnside Hunters and Trappers Organization (BHTO) commented on the importance of land and animal use, and concerns faced by all of Nunavut related to development's potential impact on arctic animals, including the Bathurst caribou herd.[534] The BHTO commented on Sabina's proposed WMMPP and stressed the importance of employing the proposed mitigation measures effectively, particularly for Bathurst caribou during periods of migration to calving and winter grounds, and until the herd's population has recovered. The BHTO identified that need for Sabina to consult the BHTO and the Omingmaktok Hunters and Trappers Organization (OHTO) on the Bathurst herd during the various proposed engineering, construction, and operating timelines. In its response to the BHTO's submission on the FEIS Addendum, delivered during the supplemental Final Hearing, Sabina acknowledged the BHTO's concerns for the protection of wildlife, particularly the Bathurst caribou herd, and highlighted updates made to the revised WMMPP to address community concerns. Sabina discussed where input from community comments was incorporated into the WMMPP, and how concerns related to calving and post-calving habitats and shifts were incorporated into its proposed staged reduction and operational shutdown protocols, as well as its scientific and Traditional Monitoring commitments around caribou health. Sabina thanked the residents of Bathurst Inlet and Bay Chimo for their ongoing input on the WMMPP and noted that it expects to continue to engage with them throughout the proposed Project, and potentially through the Inuit Environmental Advisory Committee. [535, 536]

In its final written submission on the FEIS Addendum, the Łutsel K'e Dene First Nation (LKDFN) provided comments related to wildlife (caribou) habitat loss, indirect mortality to caribou, sensory disturbance to caribou during critical periods, and regional caribou management and recovery planning. The LKDFN identified programs and frameworks related to caribou management currently in development within Nunavut and the Northwest Territories including the Bathurst Caribou Range Plan (BCRP), the Bathurst Caribou Herd Co-operative Advisory Committee (BCHACA), and the draft Nunavut Land Use Plan. Within its discussion on the coordinated efforts being undertaken for caribou protection, the LKDFN noted that the Board should not make a decision at this stage to approve the Project given the efforts being undertaken to prevent exceeding herd impact threshold limits and the Project's location in critical caribou habitat.

The LKDFN commented on Sabina's approach to habitat loss calculations, and noted that comparing habitat loss to the total seasonal range of the caribou, or total herd range, can result in low and potentially misleading values, and suggested that habitat loss calculated as a cumulative value, as well as determining habitat loss in terms of high-value habitat, are more reasonable methods. The LKDFN

[533] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 477-478, lines 15-26 and 1-12.
[534] Burnside Hunters and Trapper Organization, Final Written Submission on the FEIS Addendum, May 23, 2017.
[535] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 95-97, lines 2-26, 1-26, and 1-2.
[536] Sabina Gold & Silver Corp., Exhibit 8, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.

discussed the need to consider habitat loss in conjunction with other projects in the north, access to high-quality habitat, and potential range shifts. The LKDFN disagreed within Sabina's significance determination for habitat loss, and further discussed management responses currently detailed in the BCRP and noted that the LKDFN considers the zone closest to the Project to be at a 'critical' level, which according to the BCRP Working Group would require a management action of 'no new disturbance'. The LKDFN disagreed with Sabina's assessment of indirect mortality as only increased access by hunters, and reiterated its suggestion that more avenues should be investigated through the assessment such as physical damage and changes to caribou that have been observed by hunters and Elders since the introduction of mining.

The LKDFN noted that Sabina did not address its original comments related to alternative sources of indirect mortality, and commented that the 95% decline in caribou population is a result of more than hunting, and that it could not support the Project without knowing these potential alternative impacts. The LKDFN discussed Sabina's proposed mitigation measures contained within the WMMPP, and referenced the BCRP Working Group's determination that areas adjacent to the Project are some of the most sensitive habitat for the Bathurst caribou to avoid disturbance. The LKDFN recommended that given the heightened sensitivity of the habitat, it would be necessary to limit any disturbance and requested a more conservative-minded approach to WMMPP levels during the calving season. The LKDFN discussed Sabina's commitment to minimizing its impacts and to aligning its monitoring and mitigation activities to be consistent with recovery planning for the Bathurst herd, however, reiterated that until the three (3) processes currently underway for caribou management and recovery planning are complete and strategies are designed, a development of this scale should not be approved. The LKDFN further discussed the efforts being put into the various management programs, and identified that since the conclusion of the previous Review stage, the status of caribou has changed to a more concerning level as the International Union for Conservation of Nature listed caribou globally as "vulnerable", and the Committee on the Status of Endangered Wildlife in Canada assessed barren-ground caribou as "threatened", which could result in a designation under the SARA and the subsequent development of a recovery plan within two (2) years.

The LKDFN noted that it agreed with the Board's original determination that the risk of the Project's development, in a critical caribou habitat at a sensitive time in their history, was too great to allow the Project to proceed. The LKDFN concluded in its submission that:

> …at this time, certainty remains regarding the project's impacts to caribou, yet uncertainty still remains in the company's ability to mitigate or manage these impacts, and therefore, the precautionary approach must not allow this project to proceed at this time.[537]

In its response to the final written submissions on the FEIS Addendum, Sabina commented on the LKDFN's concerns related to wildlife (caribou) habitat loss, indirect mortality, sensory disturbance during critical periods, and regional caribou management and recovery planning. Sabina highlighted that based on caribou collar data, the Goose Property and the Marine Laydown Area (MLA) do not overlap with the Bathurst herd's range in any season, and the proposed winter ice road would not be used during part of the year when caribou would occupy the area. Sabina discussed the range of data used to generate figures within the revised WMMPP, and further noted that the BCRP displays a larger Range Assessment Area in its Interim Discussion Document, but also demonstrates there would be no overlap with the Project. Sabina noted that the Project would remove approximately 0.002% of the Beverly/Ahiak herd's

[537] Łutsel K'e Dene First Nation, Final Written Submission on the FEIS Addendum, April 24, 2017.

summer, fall, and winter range, 0.001% of its annual range, and highlighted that ECCC's Federal Recovery Strategy for woodland caribou recommends maintaining development below 30% of the caribou range. Sabina commented that the high-value habitat identified by the LKDFN is calving and post-calving habitat, and noted that the Project would not overlap with these habitats for either the Bathurst or Beverly/Ahiak herds. Sabina highlighted details within the draft Nunavut Land Use Plan and the revised WMMPP to support its statement, and noted that that GN agrees with the determination that the project site would not overlap with these habitats. Sabina further noted that based on its analysis historic collar data and Traditional Knowledge, the Bathurst herd has traditionally calved east and west of Bathurst Inlet, but not to the south. Sabina described its monitoring and mitigation plans in response to the LKDFN's concerns regarding increased protection during calving season by highlighting its approach to range mapping and caribou movement monitoring, staged reduction protocols, as well as rapid and planned operational shutdowns.

Sabina commented on the application of the BCRP and discussed the five (5) Range Assessment Areas (RAA) highlighted within the plan. Sabina noted that the Goose Property would not be located in any of the RAAs based on the BCRP's Interim Discussion Document, and that the MLA and winter ice road would be located in the RAA 1, rated as "Desirable", which is labelled low risk to caribou and habitat because the current ZOI is stated to be 1,000 km^2, below the threshold of 3,500 km^2. Sabina also noted that the continued development scenario assessed by the BCRP, which would include the operation of the Project as well as the Lupin and Ulu projects, would result in RAA 1 remaining in the "Desirable" of development according to the Interim Discussion Document. Sabina further noted that the MLA and winter ice road would not be active when caribou occupy RAA 1, therefore it considered potential project contributions to disturbance effects to be negligible. Sabina disagreed with the LKDFN's determination that the zone closest to the proposed Project is in the critical level, as the BCRP Interim Discussion Document states that RAA1 is, and would continue to be should the Project proceed, in the Desirable level. Sabina suggested that given the development timeline of the BCRP, and the "Desirable" level of development in the area, the NIRB should not delay its decision for the finalization of the BCRP.

Sabina also indicated in its response that it addressed the potential effects from indirect mortality cited by the LKDFN under several different sections in the FEIS which include the analysis of mortality due to collisions, injuries from interaction with the project, and altered predatory-prey ecology (FEIS Section 5.5.2.4, Direct Mortality); mortality from increased access and harvest (FEIS Section 5.5.2.5, Indirect Mortality); health effects, including potential for caribou mortality from consuming dust deposited on soils, consuming vegetation, and drinking water in Project ponds (FEIS, Country Foods Effects Assessment, Volume 8, Chapter 5; Human Health and Environmental Risk Assessment, Volume 8, Chapter 6; Exposure to Contaminants, Section 5.5.2.7,); and disturbance effects and potential for altered caribou energetics and reproductive productivity (Reduction in Reproductive Productivity, Section 5.5.2.8). Sabina reiterated its conclusion that its assessment predicted no residual effects of the Project on the Bathurst herd, and no significant effects on the Beverly herd.

In response to the LKDFN's recommendation that the Board allow for the establishment of caribou recovery and management efforts before approval of the Project, Sabina discussed the three (3) management processes identified by the LKDFN which included the COSEWIC and potential SARA listing processes, the Bathurst Caribou Herd Co-operative Advisory Committee, and the BCRP. Sabina discussed the various processes and potential timelines which could initiate formalized management structures for the Bathurst caribou herd, and identified the required steps that would have to be taken for the listing of barren ground caribou in the SARA. Sabina noted that the planning processes for the Bathurst herd may take years to decades to finalize, and should a SARA Action Plan be developed, it

would likely implement the BCRP as a local plan which would not apply to the Goose Property as it is outside of the BCRP RAAs, and the MLA would be located in the 'Desirable' level of development area. Sabina concluded that: "Therefore, there is no need to wait for these management plans to be produced before making a decision on the Project."[538]

In its final written submission on the FEIS Addendum the YKDFN reiterated its opposition to the Project, and highlighted its original position that the Bathurst caribou herd cannot withstand more incursions into its range and that without significant rebound in herd numbers, the YKDFN fear that there will irreparable harm to its communities. The YKDFN stated that: "The continued expansion of mining operations across the Bathurst herd's range will only exacerbate an already dire situation."[539]

The YKDFN acknowledged in its submission that Sabina has made improvements to the proposed mitigation measures, and suggested that should the Board recommend the approval of the Project, it encourages the Board to recommend the most stringent measures practicable for the protection of caribou.

During the supplemental Final Hearing, Board staff requested that Sabina comment on how data generated through its planned caribou monitoring efforts would complement or improve upon existing conservation and management efforts of the GN or the GNWT. Sabina noted in response that in studying project-related effects, a significant amount of data would be generated, and suggested that through the proposed Caribou Technical Advisory Group there would be more commentary and involvement in how monitoring programs are structured, reported, and improved. Sabina highlighted that the scenario would also result in a more fluid flow of information and data for review, analysis, interpretation, and feedback. Sabina further highlighted its commitment to participate in population-level studies should they be undertaken by the GN or GNWT.[540]

In its final written submission on the FEIS Addendum the NSMA noted that Sabina would be providing the Wildlife Effects Monitoring Program (WEMP) report to the KIA, GN, and the GNWT for comments, but not other impacted groups. The NSMA commented that it is an active participant in wildlife management in the Northwest Territories and Nunavut and recommended that Sabina include the NSMA as a party to review the WEMP report and any modifications to the WMMPP. In its response to the submission Sabina agreed to provide the NSMA and others the opportunity to review the WEMP report as well as any potential modifications to the WMMPP as part of the NIRB project monitoring processes.

During the supplemental Final Hearing, Board staff requested that Sabina comment on what edits or changes it made to its project management and monitoring plans since the 2016 Final Hearing to address concerns raised by Northwest Territories Intervenors specific to caribou, as well as comment on whether Sabina feels the updates satisfactorily address the concerns.[541] In a deferred response, Sabina noted that several changes were made to its project management and monitoring plans since the 2016 Final Hearing intended to address concerns raised by Northwest Territories Intervenors, specifically

[538]Sabina Gold & Silver Corp., Response to Final Written Submissions – Łutsel K'e Dene First Nation, May 18, 2017.
[539] Yellowknives Dene First Nation, Final Written Submission on the FEIS Addendum, April 26, 2017.
[540] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 253-254, lines 13-26 and 1.
[541] R. Barry, Board staff, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 249, lines 7-13.

related to caribou. Sabina highlighted that the NSMA, the LKDFN, the YKDFN, and the GNWT all expressed concerns regarding the potential impact of the Project on caribou, particularly the Bathurst caribou herd. Sabina noted that the first specific change made in response to the concerns was the adoption of its new objective for the WMMPP, which is no impact to caribou herds from the project. Sabina reiterated that the Project would not interact with the Bathurst herd. Sabina also identified additional analysis it undertook to further understand the location and movement of the Bathurst herd including Northwest Territories Aboriginal Traditional Knowledge, work with the Bathurst herd range planning team, analysis of additional government collar data, and baseline studies including aerial and camera studies. Sabina clarified that available data, including recent 2016 data not available the previous year, still indicated that the Project would not overlap with the seasonal ranges of the Bathurst herd and as such, it was still confident in its conclusions. Sabina stated that to achieve its goal of no impact to caribou herds, and to address concerns expressed by Northwest Territories Intervenors, it included mitigation measures to address possible range shifts by the herds, including protocols for rapid and planned operational shutdowns should calving or post-calving ranges overlap with the project site.

Sabina continued its response by outlining specific additions, amendments, and clarifications made to its management and monitoring programs in response to concerns expressed by Northwest Territories Intervenors. Sabina noted that all Northwest Territories Intervenors identified concern for the potential of cumulative effects, and stated that it has updated its mitigation and management to increase the protection of caribou, reduce project-specific effects, and as a result reduce its contribution to cumulative effects. Sabina highlighted, as an example, its adjustment of the original 2.5 km threshold for blasting to 4 km based on requests made by the GNWT and the NSMA. Sabina also highlighted its commitment to contribute to cumulative effects management and monitoring programs within the WMMPP. Sabina identified that the GNWT and the YKDFN previously requested project shutdowns the same year as a calving range shift occurs, and that as a result, it introduced a new management measures and commitment within the WMMPP for rapid operational shutdowns. Sabina identified that the NSMA previously requested greater clarity on what activities would be included during a planned operational shutdown, and that within the revised WMMPP details related to both rapid and planned operational shutdowns were provided to clearly describe all activities that would shut down should caribou calving or post-calving ranges overlap with the project site. Sabina indicated that in response to comments by several parties, including the GNWT, the NSMA, and the YKDFN, regarding the need for additional monitoring of project effects on caribou, particularly ZOI and behaviour monitoring, Sabina included additional detail within the revised WMMPP related to its ZOI, behaviour, and stress monitoring programs. Sabina identified that the GNWT, the NSMA, and the YKDFN all noted concerns with Sabina's two-stage monitoring program, which wold use collar data to trigger caribou monitors. Sabina noted that in response to these concerns, it revised its active caribou monitoring protocols to include monitoring on-site by wildlife monitors every day of the year. Sabina further identified that to address a concern expressed by the NSMA regarding the proximity and number of dustfall stations, Sabina updated the WMMPP to include additional dustfall stations at greater distances from the project site. Lastly, Sabina indicated that the most recent changes to address comments from Northwest Territories Intervenors were the commitment to reduce the number of caribou to trigger the staged reduction in project activities, and the lowered density required to trigger a rapid operational shutdown from 4.2 caribou/km^2 to 2 caribou/km^2. Sabina highlighted that it had satisfactorily addressed the concerns of the Northwest Territories Intervenors. Sabina quoted an excerpt from the YKDFN's final written submission on the FEIS Addendum and noted that the WMMPP meets the high standard for caribou protection called for within the submission. Sabina concluded that it looks forward to continued

input from the Northwest Territories on caribou matters throughout the life of the Project, and that its adaptive management frameworks would be protective of caribou, should it be approved to proceed.[542]

During the supplemental Final Hearing, Board staff requested that Sabina highlight any specific points within its monitoring and management plans designed to accommodate the potential for cumulative or transboundary effects to caribou population health resulting from factors that are external to the Project. These factors, Board staff clarified, could increase the vulnerability of the overall Bathurst caribou population to further disturbance. In response, Sabina highlighted details regarding how it would utilize the concept of herd vulnerability into adaptive management, and further highlighted factors it considered in this assessment including changes within the range; population size and trend; herd productivity; herd health; harvest information; range quality and availability, which would capture factors like fire damage to herd range or reduced range quality; predators and insects; human-caused disturbances; and weather and climate aspects. Sabina clarified that these would all be considered in its review of herd vulnerability, and reiterated its commitment to participate in cumulative effects work under government as outlined within the WMMPP.[543]

During the supplemental Final Hearing, Board staff requested that the GN describe its approach to coordinating with the GNWT in the management of the Bathurst caribou population.[544] In a deferred response the GN stated that it was working cooperatively with the GNWT on shared caribou populations, and submitted a copy of a signed memorandum of understanding between the GN and GNWT titled "Cooperation on Managing Shared Populations of Caribou (GNWT and GN)" (Exhibit 94). The GN highlighted that there is joint wildlife research on the Bathurst caribou herd led by the GNWT on demographic and population inventory, with joint participation and in-kind support of GN biologists. The GN clarified that it leads works on population inventories for other transboundary migratory herds such as the Qamanirjuaq and Beverly herds, where it receives assistance and in-kind support from GNWT biologists. The GN added that it takes part in several inter-jurisdictional technical and advisory committees and initiatives with the GNWT, Inuit and First Nations parties in the Northwest Territories, as well as Inuit co-management partners in Nunavut, including Bathurst caribou herd cooperative advisory committee, the Bathurst caribou range plan working group, the Bathurst caribou management plan technical working group. The GN concluded that it is also implementing the *Nunavut Agreement* processes on Bathurst caribou and caribou habitat initiatives in Nunavut, which include working with the Nunavut Planning Commission and co-management partners to identify critical caribou habitat and develop mechanisms to protect areas under the Nunavut Land Use Plan, the Nunavut caribou strategy, and working to implement Nunavut Wildlife Management Board decisions, such as the community-based Bathurst caribou management plan.[545]

Board staff also requested during the supplemental Final Hearing that the GN describe any coordination it may have undertaken with the GNWT specifically in the development of its submissions to the NIRB

[542] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 356-362, lines 20-26, 1-26, 1-26, 1-26, 1-26, 1-26, and 1-13.
[543] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 251-253, lines 16-26, 1-26, and 1-10.
[544] R. Barry, Board staff, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 463, lines 10-16.
[545] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 899-901, lines 3-26, 1-26, and 1-8.

for the supplemental Final Hearing related to caribou monitoring and mitigation.[546] In its deferred response, the GN indicated that during the review of the Project, technical staff worked with the GN Department of Environment and the GNWT Department of Environment and Natural Resources through discussions and information sharing on the subject of caribou monitoring, mitigation, and adaptive management. The GN noted however that had not reviewed, or provided input on, the written submission provided by the GNWT prior to submission to the NIRB, nor did the GNWT review or provide input on the GN's written submission prior to submission to the NIRB. The GN stated that the submissions were prepared independently by the respective governments.[547]

During the supplemental Final Hearing, Board staff requested that the GN comment on whether they support the findings of the independent third-party review of the WMMPP provided by Sabina.[548] In a deferred response, the GN indicated that it agreed with the third-party reviews of the WMMPP, and with the reviewers' comments that the caribou protection measures in the WMMPP are, in many respects, more comprehensive than for other projects. However, the GN highlighted that it did not entirely agree with the reviewers' comments concerning the proven effectiveness of the mitigation measures, and highlighted its written submission which identified concerns with the novel and untested nature of several caribou protection measures. The GN clarified that to address this concern the GN made several recommendations that were intended to improve confidence and ensure that caribou measures are evaluated early during the proposed project's life, including the development of a Caribou Technical Advisory Group to conduct studies to test monitoring methods and adaptive management protocols.[549]

During the supplemental Final Hearing, Board staff requested that the KIA comment on whether previous IIBAs have contained specific compensation schemes for the potential disruption of wildlife by the proponent, in the event that a proponent does not meet the agreed-upon adaptive management measures and wildlife disruption occurs. In response the KIA stated that previous agreements the KIA has made with other developments have involved Article 6 of the *Nunavut Agreement*, which relate to wildlife compensation.[550] Board staff further commented in response that comments are frequently made during community roundtable sessions regarding the consequences for proponents should they not meet agreed-upon commitments or terms and conditions specifically related to wildlife protection. Board staff clarified that its question was related to whether the KIA has previously used benefit agreements as a mechanism for dealing with potential disruption of wildlife through compensation.[551] In response, the KIA highlighted that the Review process is the KIA's first approach towards issues around wildlife, where management and monitoring measures are incorporated into project design, as it would prefer to see no effect on wildlife as opposed to compensation systems. The KIA noted that the NIRB process addresses wildlife directly through the application of conditions in the NIRB's project

[546] R. Barry, Board staff, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 464, lines 3-15.
[547] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 556-557, lines 7-26 and 1-3.
[548] R. Barry, Board staff, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 255, lines 4-17.
[549] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp.453-454, lines 20-26 and 1-17.
[550] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 438-439, lines 26 and 1-15.
[551] R. Barry, Board staff, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 339-340, lines 18-26 and 1-10.

certificate, however, that it does negotiate wildlife compensation. The KIA highlighted examples in the past where compensation was required from developers through the KIA's rights under the *Nunavut Agreement*.[552]

During the supplemental Final Hearing, Community Representatives from both Nunavut and the Northwest Territories provided comments and expressed concerns on topics related to caribou and wildlife; wildlife habitats; the WMMPP and wildlife monitoring measures; regional caribou management efforts; caribou population stressors; wildlife interaction with site features; and the cultural connection that Nunavut and Northwest Territories peoples have to the land and wildlife. Several representatives commented on the importance of the overall health of wildlife, as well as caribou, the importance of mitigation measures, and noted changes in wildlife populations.

A Community Representative from Gjoa Haven commented:

…all the people, we obviously need food, sea meat or caribou, fish, anything – anything that our native people would like to eat every day.[553]

A Community Representative from Taloyoak also discussed the importance of the application of mitigation measures and protection for terrestrial wildlife and noted:

We have to ensure that wildlife is protected, including caribou, wolf, grizzly bears, wolverines, fish, anything that we live off of.[554]

A Community Representative from Taloyoak commented:

> *…maybe perhaps it's due to climate change or animal behaviour. We don't know. But when we consume and eat country food, the texture is different. That's the one thing that I've noticed. I'm not saying it's bad. It's just an observation that I've made.*[555]

In its responses Sabina highlighted that it developed strict mitigation measures, particularly weighted towards the protection of caribou. Sabina further noted its commitment to monitoring project components that have the potential to impact wildlife such as dust and water quality, as well as wildlife interaction with project components and that it is committed to monitoring programs to ensure that country food would stay healthy and is safe to eat.[556]

During the supplemental Final Hearing a Community Representative from Wekweètì expressed concerns regarding potential impacts to caribou migration, calving grounds, and the population of the Bathurst

[552] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 440-441, lines 12-26 and 1-18.
[553] P. Akkikungnaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 678, lines 21-23.
[554] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 693, lines 23-26.
[555] S. Oleekatalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 698-699, lines 18-26 and 1-21.
[556] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 700, lines 1-17.

caribou herd. The representative discussed the population decline of the Bathurst herd and the effect it has had on the harvesting of country food and stated:

> *…the caribou itself, I guess, you know, do migrate without borders I'm only greatly concerned about is the Bathurst herd. So the -- since last five, six years, I guess, you know, that the populations of Bathurst herd had dropped so -- so low that today, I guess, is practically banned for most of the people that rely on the country food from the – especially the caribou….we as Aboriginal people…we're interested the economy of the country, but, nonetheless, we're mostly – our priority is always the wildlife and the -- you know, what's in the water -- the water is very important as well too …*[557]

> *…the caribou and the wildlifes are very important.*[558]

The Community Representative expressed further concern regarding impacts to caribou migration, wildlife interaction with tailings facilities, as well as potential impacts from the displacement of arsenic-laden dust. The representative also questioned Sabina as to whether it would be building culverts or bridges as part of its operations.

Similarly, a Community Representative from Gjoa Haven expressed concerns regarding the construction of dams and dikes noting: *"I also don't like to see dams built or dikes built. Animals provide for us. I think of my people. If we don't have any way to access our country food, we would also be impacted."*[559]

A Community Representative from Behchokǫ̀ also expressed concerns regarding blasting operations, and the potential associated impacts from dust displacement and hazards to wildlife. The representative stated:

> *…although the mine is located way away from us, but, nonetheless, the -- we are experiencing the same thing within our area… we're concerned about blasting from the -- from the rocks, and then the -- including the -- where the one -- wind blows and where all the dust that, you know, has been carried away -- how far dust travels and all that creates some problems/concerns… all that creates some problems/concerns because, you know, like the -- it might be considered as an acid rain, I guess, and once the dust goes up, I guess it has to come down… they create some hazard for the wildlife animals*. [560]

In its responses Sabina noted that it shared the representatives' concerns regarding the Bathurst herd, and reiterated that the Project would not be in the current range of Bathurst caribou. Sabina highlighted that the potential for changed use of the land was an identified concern in the NIRB process and resulted in the development of management measures should range shifts occur. Sabina clarified that the proposed road that would connect the MLA and the mine site would be a winter road which

[557] J. Judas, Wekweètì, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 724-725, lines 9-26 and 1-23.
[558] J. Judas, Wekweètì, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 727, lines 2-3.
[559] M. Aglukkaq., Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 690, lines 6-13.
[560] M.L. Rabesca, Behchokǫ̀, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 723-724, lines 13-26 and 1-6.

would operate yearly from December to April 15, and would not require culvert crossings. Sabina further clarified that the Project would have some small dams and water retention structures within the project footprint, though it would not be developing long roads that could potentially affect the migration of caribou or other terrestrial wildlife.[561] Regarding arsenic concerns, Sabina highlighted that the Project would have different processing than the Northwest Territories' Giant Mine, and that the arsenic issues tied to the Giant Mine would not exist with the Project as it would not create arsenic trioxide.[562]

During the supplemental Final Hearing a Community Representative from Łutsel K'e expressed their opinion on the impacts that mining has had on caribou in the Northwest Territories, and noted that as mining has developed, less caribou have been seen and hunters have to travel farther to harvest. The representative further cautioned that commitments made by proponents during the assessment of projects may not result in caribou protection, or be upheld during operations. The representative also discussed the displacement of caribou and the destruction of habitat from influences like mining operations and climate change, and stated:

> *…in a few years down the road, you guys are going to go hunting a long ways and maybe never see caribou close. It's going to move further and further… They also do all kinds of blasting being – heavy equipment is driving… For me, when they said the Bathurst is not going to be close to their -- to their gold mine, you know, it's climate change. Everything moves all over the place. We see caribou that we never seen in our area. They move. They never stay in one place.*[563]

The representative further cautioned that threats to caribou could extend to herds other than the Bathurst herd, and that wildlife movements have introduced new terrestrial species to her lands, including moose.

> *Yes, they did close Bathurst caribou for us not to go and hunt for them because it's declining. It's not going to be just Bathurst. It will be every caribou is going to be declining later if we don't take care of it today…It doesn't matter what kind of caribou there is.*[564]

In response, Sabina agreed with the representative's statement that caribou are mobile and change their use of the land and highlighted its commitment that it intends for no impacts to caribou herds. Sabina further commented on how its proposed mitigation measures differ and would be more protective than those in the Northwest Territories, and discussed specific measures such as blasting setbacks, road setbacks, and operational shutdowns that would be intended for all caribou. Sabina also noted that it would expect authorities such at the KIA, GN, and the NIRB to ensure that Sabina maintains its commitments and potentially impose consequences should it not.[565]

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[561] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 148, lines 3-15.
[562] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 724-725, 726, 729, 730-731, lines 14-26 and 1-17; 13-26; 8-19; 14-26; and 1-3.
[563] D. Enzoe, Łutsel K'e, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 794-796 lines 24-26, 1-26, and 1-5.
[564] D. Enzoe, Łutsel K'e, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 796-798 lines 24-24, 1-26, and 1-2.
[565] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 798-800, lines 6-26, 1-26, and 1-9.

A Community Representative from Wekweètì also commented on Bathurst caribou herd range shifts, and expressed concerns regarding the health of caribou in response to mining operations. The Community Representative stated:

> *…there's one hunter that -- that preparing some meat after the hunt, I guess, on -- without a rubber glove… some sores that came along to this individual person that was preparing meat because of that -- I don't know how this disease got into the animal, but I hate to blame the mining companies, but, nonetheless, there's some things that are learned -- to be learned from, activities that have been taking place.*[566]

During the supplemental Final Hearing a member of the public from Cambridge Bay opposed the Project and expressed concerns regarding the declining state of caribou populations, potential impacts of mining on wildlife and wildlife habitats, the environment, and Inuit cultural identity. The representative discussed several points related to Inuit identity and its ties to wildlife, harvesting, and traditional lifestyles.

> *…Hunting caribou has always been a birth right, and it is soon fading quickly with mines coming in and destroying the very land our ancestors survived and thrived upon, the very animals that have allowed the Inuit and other indigenous people to survive on.*[567]

> *…what happens in 14 years when the mine closes and the land is ruined and our caribou in the area are -- are no longer existent? Those caribou are already on the verge of being classified as threatened, if not already threatened. How sad that we have come to a second hearing even with that one piece of information, that the caribou is almost nonexistent in that area.*[568]

A Community Representative from Kugluktuk expressed concern during the supplemental Final Hearing regarding the potential for impacts to caribou movement from obstructions along the proposed winter ice road, such as large snowbanks. In response, Sabina indicated that it has committed to keeping snowbanks at less than half a metre to ensure safe passage for people and caribou. Sabina further added that if required, based on observations of many caribou crossing over extended periods of time, it could lower the snowbanks further to ease movement.[569]

During the supplemental Final Hearing a Community Representative from Gjoa Haven requested that Sabina clarify whether the Project would use summer or winter shipping.[570] Sabina confirmed in response that shipping would only occur during the summer season, and reiterated its commitment

[566] C. Football, Wekweètì, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 735-736, lines 10-26 and 1.
[567] J. Angulalik, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017 pp. 777-778, lines 24-26 and 1-3.
[568] J. Angulalik, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 781, lines 6-13.
[569] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 810-811, lines 8-26 and 1-10.
[570] P. Akkikungnaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 678-679, lines 25-26 and 1.

made to the GN that it would not be breaking ice as part of the Project due to concerns related to the seasonal movements of the Dolphin and Union caribou herd.[571]

During the supplemental Final Hearing a representative from the NSMA questioned Sabina as to whether the WMMPP would apply to the Marine Laydown Area (MLA) during the summer since the MLA would be operational for approximately six (6) weeks in the summer period. In response Sabina noted that although the WMMPP was heavily focussed on the Goose site, and that assessments have shown very little caribou at the MLA during summer, some of the WMMPP measures would be utilized, particularly measures for lower thresholds and induvial caribou. Sabina added that should larger groups be encountered, it would engage with the relevant authorities to ensure similar mitigation would be in place as compared to the Goose site.[572]

During the supplemental Final Hearing a Community Representative from Gjoa Haven requested that Sabina clarify its proposed work stoppage protocols for heavy equipment operators in response to caribou movement. In response, Sabina clarified that work stoppages for heavy equipment could be undertaken under Level 4 staged reductions, or during either Level 5 or Level 6 shutdown scenarios. Sabina elaborated that initial response would involve stopping the vehicle, reporting in through radio, and waiting with engines shut down depending on the time of year. Sabina added that should the stoppage extend beyond 20 to 30 minutes, drivers would be retrieved with a passenger vehicle. Sabina highlighted that during rapid or planned operational shutdowns all drivers, pit operators, and blasters would be moved back to camp, and planned operational shutdowns may involve sending people home for the period, or finding other duties on-site or a combination of time at home.[573]

During the supplemental Final Hearing several community representatives also commented on other stressors and impacts to caribou populations. A representative from Kugluktuk discussed his experience in the mining industry and his impression of wildlife management on mine sites. The representative discussed his experience working at the Echo Bay and the Ekati Diamond mines, and indicated that in his observations of caribou migration through both sites, disturbance to caribou from mining operations was minimal. The representative acknowledged the declining populations of caribou and stated:

> *…the mining company is a small part of the -- the problem there, but we believe that the majority of the problem with the caribous nowadays is other predators and – and change of climate. So that's -- that's what's happening. Because of very large predators -- like, the wolves have increased their population. You know that the wolf gets seven pups a year; caribou gets one calf. So if we -- if we don't manage our wildlife properly, the GN and GNWT, then our herds will deplete all the time… mining company is not part of the major problems of the caribou.* [574]

[571] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 679, lines 19-26.
[572] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 800-801, lines 12-26 and 1-13.
[573] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 790-792, lines 14-26, 1-26, and 1-7.
[574] J. Palongayak, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 805-806, lines 5-26 and 1-21.

The representative reiterated his comments during the Community Roundtable closing statements, and added that the introduction of more abundant and new predatory species are impacting caribou populations:

> *We have grizzly bears now, which is in abundance, and they -- they also go after caribou. And we have a new predator in -- in our region. It's called the bald eagle. And you know the bald eagle always go for the young calves. So they're the biggest problems in declining of caribou.*[575]

Similarly, a Community Representative from Cambridge Bay commented on his experience with regional caribou management, harvesting, and stressors affecting caribou populations. Regarding caribou populations, the representative noted:

> *I sat on the Elders advisory committee for the Nunavut government, and as well, I've sat on Inuit advisory group for the TMAC and -- along with the Kugluktuk delegates and Bathurst delegates and as well Bay Chimo delegates. So we sit on that advisory group. We often told the government, Why don't you listen to our advice? It's not human activity. It's not mining. It's the predation.*[576]

The representative further commented on stressors to caribou and stated:

> *About three years ago, about 80 miles on the coastline west of here on the island, I was out caribou hunting, and not even 2-miles radius I ran into about eight dead caribou, half eaten, all killed by wolves. And, you know, it's not human activity. It's not mining. It's the predation. Everyone should know that. You know, they're blaming human activity. They're blaming the mines…. I've been observing, harvesting caribou for over 50 years, and, you know, I've seen a lot of caribou that were killed by wolves…*[577]

A Community Representative from Kugaaruk commented on the fluctuating populations of caribou, as well as caribou movement patterns in response to stimulus, such as noise. The representative discussed historical hunting patterns and suggested that several factors contribute to variation in caribou populations such as disease, noise, and predation:

> *In those days, I start to realize caribou has a cycle that we were taught by our ancestors and that when caribou behaviour -- when there is too much noise and – they will start to move away from a certain area where they're used to going… I'm not only speaking about the mining companies. There is other factors where caribou may be depleting… Predators are a factor as well because they have to eat in order to survive as well. So the predators are primarily one of the factors when caribou start depleting because they go after the young ones as well when the – there was -- during the calving season…* [578]

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[575] J. Palongayak, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 1024-1025, lines 23-26 and 1-2.

[576] J. Haniliak Sr., Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 820-821, lines 8-26 and 1-9.

[577] J. Haniliak Sr., Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 821, lines 10-22.

[578] O. Alakannuark, Kugaaruk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 811-814, lines 25-25, 1-26, 1-26, and 1-6.

The representative further suggested that: *"…the caribou population is a cycle…perhaps some day during our younger generation's older years, the caribou will populate again."*[579]

Similarly, a representative from Kingaok (Bathurst Inlet) discussed grizzly bear sightings in her area and commented:

> *It's not only mining that ruins the cycle of the animals…Caribou issue we need to fix as a region, not only blame others such as the mining sector…We need to work with people around us for that problem, find the solution to how we can save the tuktu, not only by being negative about the mining company. Because it's something that they are trying to do for Nunavummiut, we should at least support that and find a solution to the tuktu problem.*[580]

During the supplemental Final Hearing, and a Community Representative from Gjoa Haven expressed concerns to the GN regarding the seasonal migration challenges of caribou in their area, noting that during spring break-up caribou try to cross water features in their area and fall through the ice, sometimes causing drowning.[581]

During the supplemental Final Hearing, a Community Representative from Taloyoak expressed concerns regarding the monitoring of caribou using collars, noting particular concern with the impact of collar wear on caribou fur. The representative requested that Sabina clarify who is responsible for installing collars on caribou.[582] Sabina indicated in response that it proposed to use collar data to monitor caribou, but that depending on the herd, the GN or the GNWT are responsible for installing the collars.[583] The representative further questioned the GN as to how many caribou collars are installed on caribou, and how long they remain fixed. In response, the GN noted that the number of collars deployed correlates with the relevant research being conducted and what is required to consistently define and illustrate caribou movement. The GN noted that prior to conducting collaring activities, it consults with local communities to address any issues they may have. The GN highlighted an example of this consultation where in 2015 the GN reduced its collaring program for the Dolphin and Union herd from 50 collars to 25 based on community feedback.[584]

Similarly, a Community Representative from Gjoa Haven expressed concerns to the GN regarding caribou collaring procedures:

> *My question is why is the caribou collared and sometimes drugged? Because once that happens, when the animal is -- has been drugged and the meat becomes not good for consumption… I feel*

[579] O. Alakannuark, Kugaaruk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 813-814, lines 22-26 and 1-6.
[580] C. Kapolak, Kingaok (Bathurst Inlet), NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017 pp. 1019-1020, lines 14-26 and 1-13.
[581] S. Qitsualik, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 936, lines 6-14.
[582] J. Ugyuk, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 700-701, lines 26 and 1-9.
[583] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 701-702, lines 11-26 and 1-2.
[584] L. Perrin, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 918-919, pp. 4-26 and 1-2.

> *very strongly that the caribou should not be collared for any reason. That is not our tradition to be collaring caribou amongst other animals*.[585]

A Community Representative from Taloyoak questioned the GN:

> *…are the collars really necessary? Because sometimes they go -- like, they're on the neck of the caribou, and they could get frustrated, and is there any other way that you could keep track of the caribou?*[586]

In its responses, the GN acknowledged that communities, as well as the GN, have had concerns regarding collaring programs and noted that it has been actively looking for methods to collect caribou data that minimize the need for handling. The GN stated that at this time there are no alternative methods available to collect information on the movements of caribou with the detail provided by collars, although the technology in collars is being improved constantly to reduce weight, size, wear, and handling required. The GN added that the amount of collaring done is carefully considered prior installation, and provided an example that for a herd with a population of 100,000 or 200,000, it would have a goal of 40 or 50 collars at any point in time to ensure that only a small number of animals would be collared in comparison to the total size of the herd. The GN concluded that the information provided by the collars is essential and was used extensively in the assessment of the Project, and that potentially new methods will replace the need for collaring in the future.[587] In response to the Taloyoak representative's question, the GN reiterated that it recognizes the longstanding concerns around the use of caribou collars, however, the broad information collected by caribou collars, including migratory patterns, routes, behaviour, is not possible through other collection methods at this time.[588]

During the supplemental Final Hearing, a Community Representative from Behchokǫ̀ requested that Sabina clarify details surrounding the stress hormone study proposed within the WMMPP and why the study would be conducted only within the first two (2) years of operations. The Community Representative suggested that a later study may be able to better detect impacts to caribou from the mine. The representative also requested that Sabina clarify why the size of the as-built Project could differ compared to the size presented in the FEIS, as discussed within the footprint-size monitoring section of the WMMPP. In response, Sabina clarified that the purpose of the stress hormone study would be to detect if caribou become stressed when they are near the Project, and that the monitoring component was requested as a single study. Sabina highlighted, however, that should the Caribou Technical Advisory Group feel that additional study may be required, additional years may be included in this monitoring component.[589] Regarding footprint monitoring, Sabina indicated that footprint changes

[585] M. Aglukkaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 940, lines 8-16.
[586] S. Oleekatalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 943, lines 6-14.
[587] S. Atkinson, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 940-942, lines 4-16, 10-26, and 1-25.
[588] S. Atkinson, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 943-944, lines 18-26 and 1-6.
[589] G. Sharam, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 716-720, lines 21-26, 1-26, 1-26, and 1-9.

would be subject to natural variation throughout potential subsequent regulatory processes and that any major changes would be subject to appropriate review and potential changes to permits.[590]

During the supplemental Final Hearing, a Community Representative from Cambridge Bay requested that Sabina clarify its proposed community reporting procedures should animals or habitats be affected by the Project. In response, Sabina clarified that major incidents such as significant spills, accidents, and direct wildlife mortalities would be immediately reported to various authorities, such as the KIA, and within hours individual communities would be notified. Sabina noted that it was still developing its contact network for this type of reporting, however, that it is committed to quick initial communication to ensure that information is shared. Sabina also added that on a larger scale this information would be incorporated into its wildlife and environmental monitoring and reporting structures.[591]

A Community Representative from Taloyoak commented during the supplemental Final Hearing on the proposed Caribou Technical Advisory Group, and suggested to the KIA that representatives from the eastern Kitikmeot communities be included due to the potential for impacts on other herds from the Project.[592] In response, the KIA acknowledged the representative's concerns regarding potential impacts to caribou and highlighted that potentially two (2) committees would be created as part of the Project, the IEAC and the Caribou Technical Advisory Group. The KIA noted that the IEAC would be comprised of Inuit that are familiar with the project who have Traditional Knowledge about the immediate area and/or are current land users, while the Caribou Technical Advisory Group would include the KIA, GN, Sabina, as well as potentially other Nunavut organizations, although specific terms of reference have not been developed.[593]

During the supplemental Final Hearing, a Community Representative from Kugluktuk commented on the coordinated efforts being undertaken by the Kugluktuk Hunters and Trappers Association, the GN, and the GNWT on the management of caribou, as well as the management of predator species such as grizzly bear, wolves, and wolverine. The representative noted that the Kugluktuk Hunters and Trappers Association has exercised its rights to manage the Bluenose-East caribou herd and discussed measures it has taken to manage predation with high quotas and open seasons for beneficiaries. The representative discussed hunter sampling undertaken by hunters for muskox and caribou from the Dolphin and Union and Bluenose-East herds, and noted that harvesting of the Bathurst herd is rare due to infrequent migration of the herd to the coastline and far travelling distances. The representative concluded by stating that the Kitikmeot Regional Wildlife Management Board is working proactively with the GN, GNWT and Aboriginal groups from below the treeline.[594]

During the supplemental Final Hearing a Community Representative from Gjoa Haven requested that Sabina clarify the locations of caribou calving grounds. In response Sabina discussed the current calving grounds of the Beverly/Ahiak, Bathurst, and Dolphin and Union caribou herds, highlighting their

[590] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 719-720, lines 11-26 and 1-4.
[591] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 877-879, lines 23-26, 1-26, and 1-21.
[592] J. Ugyuk, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 891-892, lines 20-26 and 1-8.
[593] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 893-894, lines 17-26 and 1-13.
[594] L. Adjun, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 801-803, lines 16-26, 1-26, and 1-9.

locations and proximities to communities. The representative clarified her inquiry and questioned Sabina as to whether it received a map of caribou calving grounds developed with Elders from Gjoa Haven. Sabina noted that it had not received a map and suggested that the representative may have had discussions with a separate company due to the distance of the herds around Gjoa Haven to the project site, however noted it was open to receiving any additional information that is available.[595]

A Community Representative from Kugluktuk stated during the supplemental Final Hearing that he was pleased that Sabina had worked closely with the North Slave Métis, Łutsel K'e Dene, and the communities of Wekweètì and Behchokǫ̀, and stressed the importance of caribou as a shared resource.[596] Sabina agreed with the representative's comment and highlighted that Sabina aimed to refine caribou protection measures to ensure that it is successful in the protection of caribou and the herds. [597]

During the closing statements at supplemental Final Hearing, representatives from Kingaok (Bathurst Inlet, Omingmaktok (Bay Chimo), Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and Kugaaruk expressed their support for the Project and reiterated their expectations that Sabina would adhere to the proposed mitigation and adaptive management measures, would use local guides for project monitoring, incorporate Traditional Knowledge into its monitoring programs, and would share caribou data and monitoring results with interested parties for the protection of the environment and wildlife. Several representatives from both Nunavut and the Northwest Territories commended Sabina on its development of revised and better communicated management measures for the protection of wildlife and caribou.

As previously noted, during the supplemental Final Hearing a member of the public from Cambridge Bay opposed the Project due the declining state of caribou populations and potential impacts from the Project and mining on wildlife and wildlife habitats, the environment, and Inuit culture and identity.[598] Similarly, through their respective submission on the FEIS Addendum, the LKDFN and the YKDFN reiterated their original opposition to the Project due to several concerns related to caribou including cumulative stressors on the Bathurst caribou herd, declining caribou population, ongoing caribou recovery efforts, uncertainty regarding the Proponent's ability to mitigate impacts to caribou, and associated potential impacts to Dene culture and identity.[599,600] During the supplemental Final Hearing the NSMA acknowledged Sabina's work in revising the WMMPP and suggested that the most recent version of the plan is more protective of wildlife. The NSMA commented that despite best intentions and the proposal of protective wildlife management plans, the NSMA is unable to support the Project due to the risks it presents and the lack of promised benefits to the NSMA from the proposed

[595] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp.792-794, lines 10-26, 1-26, and 1-21.
[596] P. Taktogon, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 676, lines 15-25.
[597] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 677, lines 11-23.
[598] J. Angulalik, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017 pp. 776-785, lines 20-26, 1-26, 1-26, 1-26, 1-26, 1-26, 1-26,1-26, 1-26, and 1-2.
[599] Łutsel K'e Dene First Nation, Final Written Submission on the FEIS Addendum, April 24, 2017.
[600] Yellowknives Dene First Nation, Final Written Submission on the FEIS Addendum, April 26, 2017.

development.[601] In response to the NSMA's comments Sabina committed to continuing to engage with the NSMA with hopes to realize socio-economic benefits for the NSMA and its members.[602]

During its presentation and closing statements at the supplemental Final Hearing, the KIA expressed its confidence in Sabina's proposed wildlife and caribou protection measures, and noted that in its view any remaining environmental issues could be managed through the conditions a NIRB's project certificate, regulatory processes, and the adaptive management approach, which includes Inuit, that has been proposed and committed to by Sabina. The KIA stated that subject to its requirements, the KIA continues to support the Project. [603, 604]

During its presentation at the supplemental Final Hearing, the GN commented that based on the revisions made to the WMMPP and Sabina's additional commitments, Sabina had fulfilled its commitments and addressed the GN's outstanding concerns to the extent possible. The GN noted that it had increased confidence in the Proponent's ability to minimize the project's effect on the terrestrial environment, in particular caribou, through mitigation and adaptive management, assuming measures are fully implemented and function effectively in the manner intended. The GN commented that the adoption of its proposed commitments, terms and conditions will strengthen the proponent's conclusions and increase its confidence that the proposed environmental protections would be felt by Nunavummiut through the life of the Back River Project. The GN offered its conditional support for the Project, pending the outcome of the NIRB's Review process.[605, 606]

ECCC noted during the conclusion of its presentation at the supplemental Final Hearing that it was satisfied with Sabina's commitments and responses to the Department's technical comments and recommendations and had no outstanding issues.[607] The BHTO also noted its support for Sabina during the closing statements of the supplemental Final Hearing.[608]

4.11.3 Views of the Board

As noted within the 2016 Final Hearing Report, the Board acknowledges that throughout the Review of the Back River Gold Mine Project (Back River Project or the Project), concerns regarding potential impacts to terrestrial wildlife were shared by many intervening parties and community members both from Nunavut and from the Northwest Territories. As expressed through technical commenting periods

[601] S. Shiga, North Slave Métis Alliance, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 613-615, lines 21-26, 2-16, and 1-6.
[602] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 616, lines 18-25.
[603] P. Emingak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 846- 850, lines 14-26, 1-26, 1-26, 1-26, and 1-2.
[604] S. Anablak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 1044-1047 lines 18-26, 1-26, 1-26, and 1-2.
[605] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 453-454, lines 7-26 and 1-2.
[606] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 456, lines 2-22.
[607] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 488-489, lines 12-26 and 1-7.
[608] C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036, June 3, 2017, pp. 1020-1021, lines 10-26 and 1-2.

and throughout both Final Hearings, impacts to terrestrial wildlife, particularly caribou, are of significant concern considering the current population levels of barren-ground caribou herds, and the cumulative influences that development, climate change, harvesting pressures, predation, and natural population variability have on wildlife overall. Besides the ecological importance of wildlife within natural ecosystems, wildlife are intrinsically linked to the culture, identity, spirituality, and livelihood of Inuit, Nunavummiut, and northern peoples. The Board reiterates its recognition of this importance, and appreciates the significant contributions made by intervening parties and community members throughout the entire Review process.

Within the 2016 Final Hearing Report the Board expressed concerns that the Project, as proposed, would not adequately manage potential impacts on wildlife and wildlife habitat that could result. The Board noted particular uncertainty related to the effects assessment undertaken by the Proponent and the potential underestimation of wildlife interactions with the Project. This contributed to the Board having concerns for the associated potential effects to seasonal wildlife ranges and for the ability of the proposed wildlife mitigation, monitoring, and adaptive management measures to satisfactorily prevent or limit impacts to caribou given the proposed management triggers, the present population health of the herds, as well as those which could be experienced during the life of the Project. The Board noted in the 2016 Final Hearing Report that these uncertainties resulted in a lack of confidence with the Proponent's effects assessment and its ability to effectively employ the proposed adaptive management measures to ensure the protection of caribou throughout all project phases.

As a result of the additional information provided within the FEIS Addendum and the updated protective measures included within the revised Wildlife Mitigation and Monitoring Program Plan (WMMPP), as well as the additional commitments made through the supplemental Review phase, significant improvements to the Proponent's proposed management measures have been realized. The Board finds that these improvements greatly reduce the previous uncertainty related to the potential impacts that could be borne by terrestrial wildlife, particularly caribou, from the Project. The Board acknowledges the significant efforts undertaken by the Proponent following the release of the 2016 Final Hearing Report to revise its proposed WMMPP in collaboration with relevant parties, stakeholders, and Nunavut and Northwest Territories communities, to address the Board's concerns. Based on the increased protective nature of the Proponent's revised wildlife management measures, as well as the Proponent's commitment to strictly adhere to, and refine, all measures throughout the life of the Project, the Board believes the Proponent would effectively mitigate impacts to terrestrial wildlife and that the Project represents a precautionary approach to resource development in an Arctic environment.

A consistent topic of discussion noted throughout commenting periods and during both Final Hearings was the proposed application of staged reduction mitigation measures should caribou approach the project area during specific seasonal periods and in specific aggregation sizes. In the 2016 Final Hearing Report, the Board noted that it had outstanding concerns regarding the adequacy of the proposed mitigation measures and whether the staged reduction of activities within prescribed zones of influence could, in reality, mitigate all impacts from the Project on caribou. Further, the Board noted a lack of confidence in the Proponent's ability to maintain its proposed mitigation protocols should extensive staged reduction events (e.g., cessation of activities) begin to impact the operational and financial feasibility of the Project. Between the 2016 Final Hearing and the close of the supplemental Final Hearing, significant refinements were made to the WMMPP by the Proponent to reduce the required thresholds for triggering staged reductions. The Board believes that through collaboration with relevant parties, stakeholders, and communities, the Proponent has proposed revised thresholds which

represent a more precautionary approach to undertake the Project within an acceptable range of environmental risk where uncertainty about caribou movements exist. The Board notes, however, that the success of staged reductions will rely on the effectiveness of early detection through monitoring, and the rigorous application of all measures will be required to effectively identify and respond to caribou presence in the project area.

Similarly, the Board acknowledges the Proponent's proposed measures for rapid and planned operational shutdowns should the calving or post-calving ranges of caribou overlap with the Project. As measures to respond to potential habitat range shifts, the Board reiterates the importance of rigorous and comprehensive monitoring to effectively track, assess, and respond to any, and all additional interactions with the Project that could result from caribou's evolving use of habitats in the project area. The Board also acknowledges the Proponent's efforts to demonstrate its financial ability to undertake the Back River Project, which reduces the Board's uncertainty related to the operational and financial feasibility of the Project in the context of the proposed wildlife management. However, the Board stresses that the economic implications of required wildlife mitigation cannot be used to excuse the Proponent from its obligations or commitments throughout the life of the Project. Further, the Board notes the importance of collaboration with relevant parties to evaluate the potential impacts to caribou from planned developments within the Proponent's mineral tenures and outside the approved project development area.

The Board strongly cautions that its increased confidence in the Proponent's ability to employ staged reduction and operational shutdown measures is contingent on the strict and timely application of all monitoring and wildlife management protocols committed to by the Proponent; the timely provision of available caribou monitoring information by of the GN and GNWT will also play an important role in the success of these measures. Should the Proponent's suite of monitoring programs, updated scientific understanding, Inuit Qaujimajatuqangit, Traditional Knowledge, community feedback, or any other source of relevant data reveal that the thresholds employed are not effective in limiting impacts to caribou, the Board expects that appropriate adaptive management measures will be employed to prevent adverse impacts to terrestrial wildlife from occurring.

In this regard, the Board stresses the important roles of both the Inuit Environmental Advisory Committee as well as the Caribou Technical Advisory Group to ensure that accurate and informative data is collected, analyzed, and considered to supplement the ongoing assessment and refinement of the Project's environmental management measures. The management of caribou is a shared responsibility, and as such, the Board expects comprehensive participation in both processes by the Proponent, relevant government authorities and parties, stakeholder groups, community participants, and specialists, as required. It will be critically important that all those parties with relevant specialist knowledge are invited to participate and offer perspectives for consideration through this working group, and in turn that relevant government authorities dedicate sufficient capacity to enable their continued participation through the life of the Project. Although the advisory groups will serve a critical oversight function in the monitoring of the WMMPP and the Project, the Board notes that the Proponent is solely responsible for the effective and timely application of adaptive management measures for its Project.

The Board would like to note its particular appreciation for all input provided by Community Representatives throughout the Review of the Project. The Board acknowledges those Community Representatives who expressed their sentiments regarding caribou populations in their current state being unable to sustain additional pressures from industrial development and that the proposed Project

risks the potential recovery of at-risk and deteriorating herds in the region. The Board also acknowledges the significant insight offered by Community Representatives regarding other external stressors to caribou populations, such as climate change and predation, as well as natural population variability. Given the commitments made throughout the Review of the Project, the Board expects that the Proponent will actively seek feedback from, and collaborate with, community members, particularly hunters and trappers organizations, to ensure the ongoing protection of wildlife. The Board also notes its expectation the Proponent will employ all measures available to it to ensure that the Project supports regional wildlife management efforts to the extent possible, particularly those related to caribou herd recovery.

Throughout both Final Hearings, the Board posed several questions to the Proponent, as well as relevant parties, regarding the mitigation, monitoring, and adaptive management measures proposed by Sabina, as well as associated questions related to data collection. The Board appreciates the Proponent's and parties' participation in these discussion, as it considered the feedback received by all to be essential to the assessment of the Project.

Through both Final Hearings, the Board posed a number of questions related to caribou monitoring. The Board requested clarification from the Government of the Northwest Territories (GNWT) on how many caribou from the Bathurst herd are currently collared, and whether they are female or bulls.[609] In response, the GNWT indicated that although its collaring program originally began with only 10 collared females, as of 2015 it maintains a 50-collar program, which has 30 collared females and 20 collared bulls, which is supplemented yearly.[610] The Board requested further clarification from Sabina during the 2016 Final Hearing on how fast it would receive collar data from the GNWT to monitor caribou movement within its staged reduction management plan, as well as how it would monitor herd movement accurately when collars are limited to 50 caribou.[611] In response, Sabina confirmed that caribou collar data would be delayed, and that its monitoring trigger thresholds would take into account potential delays in data transfer to ensure that appropriate monitoring thresholds would be in place.

During the supplemental Final Hearing the Board requested that the GN clarify how long monitoring collars stay attached to caribou, and whether it had information on how many years the oldest collared caribou has survived. The GN responded that caribou collar technology has developed over the years, which has led to changes in collar design, including increased battery life. The GN added that as a result, caribou may have collars on for up to two (2) to three (3) years. The GN further added that automatic release mechanisms have also developed, which can be programmed to release on a specific date to avoid the need for recapture and removal. The GN also highlighted an additional change where collars can also go into a mortality mode that is activated by no changes in movement either from a collar naturally falling off, or from death, which it also collects as data.[612]

[609] H. Ohokannoak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 700, lines 15-21.
[610] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 701-702, lines 22-26 and 1-16.
[611] K. Kalaruq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 962-963, lines 26 and 1-8.
[612] S. Atkinson, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 933-935, lines 20-26, 1-26, and 1-12.

The Board notes that some Community Representatives expressed significant concerns during the 2016 Final Hearing with regards to the potential impacts that collars can have on the health and wellbeing of caribou; while outside the scope of this assessment, the Board notes that representatives from the Government of Nunavut (GN) and the GNWT took many questions and comments on this topic, and may expect to require further discussion with community members on this topic in more appropriate venues. In response to a question from the Board regarding the potential use of microchips for caribou monitoring, the GNWT stated that microchips are typically only used for the monitoring of fish, as they do not have to transmit a signal and can only be detected within very short ranges (e.g. as fish pass through a fish ladder). The GNWT added that while it has attempted satellite image population monitoring, there are currently no acceptable alternatives to collar monitoring.[613]

During the 2016 Final Hearing Sabina added that collar monitoring would be an initial measure to identify caribou movement and that, during calving and post-calving seasons, on-site observers and on-site camera monitoring would complement collar monitoring. During other seasons, Sabina noted that collar monitoring would be supplemented by observers and incidental observations on-site and from aircraft travel.[614] The Board requested that Sabina clarify where wildlife monitors would be located within and around the proposed project area. In response, Sabina noted that monitoring locations would be dependent on the type of monitoring employed. For cameras on poles, monitoring would occur from a live feed into a control room. If truck-based monitoring or hunting-blind monitoring was taking place, monitors would be stationed throughout the site and would be mobile.[615,616] Sabina added that its proposed tower-mounted cameras would function in the dark and would also be equipped with infrared heat tracking technology.[617] In response to a question from the Board regarding monitor training, Sabina noted that monitors would receive training on caribou ecology, gender identification, and behaviour monitoring.

During the supplemental Final Hearing, the Board questioned Sabina regarding its proposed hiring for wildlife monitors, and whether hunters and trappers organizations and local Inuit would be considered for wildlife monitoring positions.[618] In response, Sabina noted its commitment to utilizing either Inuit or Northwest Territories Aboriginal group members as wildlife monitors on-site. Sabina acknowledged the value in having people who know and have spent time on the land to undertake monitoring. Sabina further noted that the Cambridge Bay Hunter and Trappers Organization has initiated the development of a business arm focussed on environmental monitors, and that it would also explore potential hiring opportunities with residents of Bathurst Inlet and Bay Chimo pending the Board's recommendation.[619]

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[613] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, pp. 1289-1290, lines 5-26 and 1-23.
[614] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 963-964, lines 9-26 and 1-24.
[615] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 343-344, lines 18-26 and 1-10.
[616] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 343-344, lines 18-26 and 1-10.
[617] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 346-347, lines 23-26 and 1-6.
[618] G. Alikut, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 135, lines 18-22.
[619] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 136-137, lines 10-26 and 1-18.

During the supplemental Final Hearing, the Board requested that the KIA clarify its interpretation of "skilled wildlife monitor", as discussed within its presentation slide on technical comments related to caribou monitoring and groupings.[620] The KIA responded that it had not discussed specific qualifications, however, ideally monitors would have knowledge of caribou behaviour, proper Traditional Knowledge to identify herds, species, and interactions, and could appropriately identify groups of caribou. The KIA further noted that monitors should be sufficiently knowledgeable to identify total group numbers and be able to make distinctions between group sizes and applicable mitigation measure classes.[621] The Board believes that the importance of involving those individuals familiar with caribou behaviour and the local environment cannot be overstated; the Board feels that the stated intentions of the Proponent and the KIA are in line with this recommended approach and, if implemented effectively will also serve to improve public confidence in monitoring and mitigation efforts while providing valuable employment opportunities for local community members.

During the 2016 Final Hearing, the Board noted concerns regarding mitigation that would be employed around the Tailings Storage Facility (TSF) and asked Sabina if the tailings storage areas would be fenced during the operation of the mine to deter wildlife from interacting with the facility. In response, Sabina stated that it has committed to employing monitoring measures to ensure that if any caribou or terrestrial wildlife were to enter the area for any length of time, they would be deterred. Sabina added that post-closure, the area would be drained and remediated and would resemble more of an elevated mound that would have sloping ledges as to not create risks for terrestrial mammals.[622] Within Exhibit 92 (2016 Final Hearing), Sabina committed to developing an adaptive management plan, in conjunction with the Kitikmeot Inuit Association (KIA), if caribou are observed to be drinking from the tailings water.[623] The Board further requested that the KIA clarify what dialogue occurred between the KIA and Sabina that led to not requesting that a fence be installed around the tailings pond. In response, the KIA stated that in its experience, fencing can injure wildlife and noted that should the proposed monitoring measures reveal interaction that needs to be mitigated, it would consult with Sabina to develop mitigation measures accordingly.[624]

During the 2016 Final Hearing, the Board requested clarification from Sabina regarding what smell and fume management measures would be employed on-site to limit attraction and impacts to wildlife.[625] In response to this question, and others related to wildlife attraction, Sabina stated that wildlife attraction would be mitigated through site hardening to exclude animals from buildings, waste storage and handling measures to properly manage wastes as to not attract wildlife, and monitoring measures to

[620] P. (Omingmakyok) Kadlun, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 442, lines 2-7.
[621] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 442, lines 8-23.
[622] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 966-967, lines 2-26 and 1-3.
[623] Kitikmeot Inuit Association and Sabina Gold & Silver Corp., Joint Submission, Exhibit 92, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016.
[624] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1088-1089, lines 10-26 and 1-5.
[625] E. Copland, Board Chairperson, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 347, lines 7-13.

ensure that mitigation was effective. Sabina added that its hazardous chemical management and handling plans are also designed protect wildlife from chemical exposure and associated impacts. [626,627]

During the 2016 Final Hearing, the Board questioned Sabina regarding its collection methods and use of baseline data within its effects assessment. Regarding the use of collar data, the Board questioned the GN as to whether it supported the interpretation of collar data used by Sabina, noting that it was cited as being sourced from the GNWT.[628] In response, the GN noted that the maps presented also include data provided by the GN, and that GN caribou maps are similar to those provided by the GNWT.[629] The Board further requested that Sabina clarify details surrounding its baseline camera monitoring program including the locations and distances that were monitored throughout the study area. Sabina indicated that its baseline camera monitoring program was conducted from 2012 through 2015 with the goal of passively collecting caribou distribution data in lieu of aerial surveys, as well as collecting data to complement two (2) Traditional Knowledge studies that were being conducted in collaboration with the KIA on historical hunting and camping areas. Sabina added that most cameras were located within 35 km of the Goose Property, within the regional study area, as well as along the road route in the western river basin, in Bathurst Inlet, and in areas between Contwoyto Lake and the project site. Sabina further noted that results from its baseline data collection program provided valuable information on caribou and bear distribution, confirmed collar data, and also confirmed Traditional Knowledge on caribou seasonal land use in the study areas.[630] In response to further questions from the Board regarding the line-of-sight and range detection boundaries for the motion-triggered cameras[631], Sabina stated that its cameras are triggered at approximately 30 m and have a limited field of vision.

During the 2016 Final Hearing the Board also requested that Sabina clarify its analysis of calving ground locations, noting that Inuit Traditional Knowledge shows that calving formerly occurred on the east side of Bathurst Inlet, and not on the west side as focused on in its presentation. Based on Traditional Knowledge, the Board further illustrated that if calving were to occur on the east side of Bathurst Inlet, caribou would travel around the Inlet during migration which would overlap with the project area.[632] In response, Sabina indicated that its effects assessment conclusions for caribou presented during the 2016 Final Hearing were based on the current state of caribou habitat areas; however, all three (3) herd range scenarios were considered within the FEIS using available scientific and Traditional Knowledge.[633] The Board further questioned as to whether caribou population increases could potentially result in

[626] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 347-348, lines 14-26 and 1-17.
[627] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 830, lines 16-25.
[628] K. Kalaruq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 436, lines 12-23.
[629] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 437, lines 5-22.
[630] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 337-339.
[631] K. Kalaruq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 345, lines 5-12.
[632] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 340-341, lines 4-26 and 1-5.
[633] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 341-343.

Bathurst caribou range overlap with the Goose Property.[634] Sabina noted in response that its analysis indicated that calving and post-calving ranges have remained mostly the same even while the herd has declined, although its summer range has declined in size. Based on current data, Sabina summarized that it wouldn't expect an increase in herd size to increase its range.[635]

During the supplemental Final Hearing, the Board requested that the GN clarify if information collected from communities related to caribou was included within the caribou data it used through the environmental assessment process, and how it was used. In response, the GN noted that its caribou data and monitoring programs are mostly focussed on conducting surveys to assess herd size, population trends, and migratory patterns. The GN clarified that for the purpose of environmental assessment, the collected information is typically made available through the assessment, although information collected from community members is typically collected on a case-by-case basis by proponents.[636] Sabina added to the GN's response, noting that it utilized information from communities acquired through community meetings which are stored, tracked, and accessed through a database, in addition to its Traditional Knowledge resources.[637]

The Board further requested that the GN comment on whether it shares the caribou data it collects, and whether it has difficulties in exchanging caribou data with other jurisdictions. The GN responded that it shares caribou data with the GNWT and that its memorandum of understanding with the GNWT (Exhibit 94, supplemental Final Hearing) includes an agreement to freely share caribou data. The GN noted that delays in transferring data can sometimes be problematic due to the size and scale of the data sets, though it is actively improving transfer methods.[638]

The Board acknowledges that throughout the Review of the Project, several parties expressed concerns regarding the potential for wildlife interaction with the proposed winter ice road. The Board requested that the GNWT clarify, based on its observations, how caribou respond to ice roads. The GNWT noted that because ice roads are only in operation during the winter, typically there have not been enough collared caribou in proximity to roads to appropriately assess the associated impacts. However, the GNWT added that relevant research does indicate that caribou do tend to avoid roads and that the level of impact depends largely on the volume of traffic.[639]

During the supplemental Final Hearing, the Board requested that Sabina clarify what activities would occur between the Marine Laydown Area and the mine site seasonally, referring specifically to road transportation and monitoring transportation activities.[640] Sabina replied that the proposed winter ice

[634] K. Kalaruq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 964-965, lines 25-26 and 1-5.
[635] G. Sharam, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 965, lines 9-19.
[636] S. Atkinson, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 926-927, lines 14-26 and 1-13.
[637] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, 927, lines 15-26.
[638] S. Atkinson, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp 932-933, lines 11-26 and 1-18.
[639] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1266-1267, lines 11-26 and 1.
[640] K. Kaluraq, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 256, lines 6-14.

road network would operate between January and April 15, and that other work done in the areas between the two (2) sites would be helicopter or fixed-wing based. Sabina clarified that all-terrain vehicles or other surface equipment would not be used on the tundra outside of the project footprint, and that it had established minimum requirements for the operation of helicopters and aircraft to ensure appropriate distances from caribou.[641]

During the supplemental Final Hearing, the Board requested that Sabina clarify the appointment process for Sabina's proposed Inuit Environmental Advisory Committee (IEAC) and Caribou Technical Advisory Group. The Board further requested that Sabina clarify if appointments would be made by Sabina, or by individual communities.[642] Sabina responded that both committees were proposed by parties and agreed to by Sabina and that the expectation for the IEAC was formed as part of the framework agreement of the Inuit Impact Benefit Agreement and the Kitikmeot Inuit Association (KIA). Sabina clarified in a deferred response that the selection process for the IEAC would involve the appointment of seven (7) Kitikmeot Inuit with knowledge of the Back River area by the implementation committee, and would include KIA and potentially additional staff or advisors as required.[643] Sabina noted that the Caribou Technical Advisory Group was developed based on a request made by the Government of Nunavut (GN) through their final written submission on the FEIS Addendum, and was agreed to by Sabina. Sabina clarified that the Caribou Technical Advisory Group would be focussed on the technical monitoring of project activities and the effectiveness of WMMPP, specific to caribou. Sabina added that it would anticipate the group to be made up of representatives from Sabina, the KIA, the GN, and the Government of the Northwest Territories (GNWT), and that it would be a life-of-mine working group.[644]

4.11.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board expressed several concerns and a high degree of uncertainty regarding the effectiveness of the Proponent's proposed wildlife mitigation and monitoring measures, as well as associated concerns related to the current state of wildlife populations in the project area. Following a review of the new material presented by Sabina in the FEIS Addendum and the supplemental Final Hearing, as well as the updated views of parties, the Board has concluded that if the significant improvements to adaptive management and monitoring, as outlined in the updated WMMPP, are fully implemented, the Project's potential effects related to terrestrial wildlife can now be appropriately managed. In addition to the implementation of the WMMPP, the mitigation and monitoring for potential effects on terrestrial wildlife will require the Proponent to comply with the commitments provided by the Proponent throughout the Board's review and compliance with key terms and conditions (a brief summary is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Developing, implementing, and maintaining an up to date Wildlife Mitigation and Monitoring Program Plan (WMMPP) throughout all phases of the Project that includes detailed monitoring,

[641] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 256-257, lines 16-26 and 1-5.
[642] A. Maghagak, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 80, lines 6-11.
[643] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 86-88, lines 10-26, 1-26, and 1-5.
[644] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 81-83, lines 14-26, 1-26, and 1-4.

mitigation and adaptive management measures for terrestrial wildlife and that reflects Inuit Qaujimajatuqangit, Traditional Knowledge and significant changes to the Project, wildlife, surrounding environment, etc.;

- Requiring consultation with, and contributions to, the existing and planned cumulative effects and regional monitoring programs for caribou, grizzly bear, wolverine and muskox, undertaken by the Government of Nunavut, the Kitikmeot Inuit Association and other relevant authorities;
- Requiring the WMMPP to provide detail regarding measures for the staged reduction of project activities, as well as rapid and planned operational shutdowns, should caribou occur in proximity to the project site;
- Requiring that consultation be conducted with the Kitikmeot Inuit Association, the Government of Nunavut, and relevant parties to ensure thresholds for monitoring and adaptive management triggers based on the use of caribou collar data adopt a reasonable buffer and recognize potential lag times resulting from delayed access to collar data;
- Demonstrating that the planning for outdoor construction activities (including site clearing, blasting, and operation of heavy equipment) during the July 26 to August 31 reflects the potential for increased caribou presence in the area;
- Confirming that all caribou mitigation and monitoring measures (including mitigation for shifts in calving and post-calving ranges) included within the Wildlife Mitigation Monitoring Program Plan apply to all caribou, regardless of the herd;
- Ensuring that within the WMMPP all criteria and procedures for deterring wildlife from blast zones (and any relaxation of mitigation measures for animals deemed project-tolerant) are developed in consultation with the Government of Nunavut and other relevant authorities and requiring that caribou deterrence measures are only used if caribou safety is at risk and the measures were developed in consultation with the Government of Nunavut;
- Requiring specific mitigation measures, trigger distances, and group size thresholds (to be developed in consultation with the Government of Nunavut) for the protection of muskox in proximity to project activities (e.g., blasting, heavy truck traffic, and aircraft) to be included in the Wildlife Mitigation and Monitoring Program Plan (WMMPP);
- Requiring that safety barriers, berms, and designed crossings associated with project infrastructure, including site roads and the winter ice road, are constructed as necessary to allow for the safe passage of caribou and other terrestrial wildlife and do not interfere with wildlife denning sites;
- Ensuring that incident reports are provided to the local wildlife conservation office for any direct wildlife mortalities that occur in association with the Project and that appropriate compensation is provided to the Designated Inuit Organization;
- Developing and implementing measures (in consultation with the Kitikmeot Inuit Association) to prevent the use of water attenuation ponds and tailings storage areas by wildlife, including waterfowl, other migratory birds, and caribou and monitoring to assess the effectiveness of such measures;
- Developing and implementing mitigation measures and monitoring programs to limit the attraction of predators and scavengers to Project facilities and activities;

- Requiring detailed reporting to the Nunavut Impact Review Board regarding terrestrial wildlife monitoring efforts and results;
- Requiring detailed reporting the Nunavut Impact Review Board regarding the effectiveness of ongoing wildlife monitoring, mitigation, and adaptive management efforts;
- Establishing and maintaining a Caribou Technical Advisory Group that will include the Proponent, the Kitikmeot Inuit Association, the Government of Nunavut, and other relevant parties; and
- Collaborating with the Government of Nunavut, the Government of the Northwest Territories, the Kitikmeot Inuit Association and other relevant parties, to evaluate the potential impacts to caribou from planned developments within the Proponent's mineral tenures and outside the approved project development area.

4.12 BIRDS AND BIRD HABITAT

4.12.1 Views of the Proponent

Sabina provided its assessment of potential project-induced impacts on birds and bird habitat in Volume 5, Sections 9 and 10, and in Volume 7, Section 6 of the FEIS. For the assessment, Sabina considered three (3) groups of migratory bird species and two (2) groups of raptor species (see Section 2.1.1: Biophysical Conditions). Migratory bird species were classified as waterbirds, upland birds, and seabirds. Waterbirds and upland birds were included as part of Sabina's assessment in Volume 5, Section 9, and waterbirds that use coastal habitats in the marine environment were assessed in Volume 7, Section 6. All information pertaining to Sabina's assessment of raptor species was provided in Volume 5, Section 10. Sabina noted that it selected species to include in its assessment based on their potential interaction with the Project, consultation with regulatory authorities, results from community consultation, and the incorporation of Traditional Knowledge. Supporting baseline information was provided in Volume 5, Appendices V5-5D, 5C, and 5F, V5-6D and Volume 7 Appendix V7-6A. Sabina noted that baseline data was collected for its assessment of migratory bird and duck species through the study of existing baseline data and through a variety of research methods, including ground surveys, aerial surveys, species-specific habitat suitability modelling, and the incorporation of Inuit Qaujimaningit and Traditional Knowledge.

Sabina's assessment of project-induced effects on birds and bird habitat resulted in the predicted occurrence of two (2) residual effects for waterbirds and upland birds (habitat loss and disturbance due to noise), five (5) residual effects for raptors (habitat loss, disturbance due to noise, direct mortality and injury, attraction, and reduced reproductive productivity), and two (2) residual effects for seabirds and seaducks (disturbance due to noise and reduction in reproductive productivity). Sabina predicted, contingent on the application of mitigation measures, that the significance of all potential residual effects would be not significant. Due to the limited spatial extent of the predicted residual effects, Sabina noted that it would not expect the potential residual effects for all birds and bird habitat from the Back River Project to contribute cumulatively with other projects, or to create any transboundary impacts.

Sabina identified the following two (2) spatial boundaries for its assessment of potential project-induced impacts on waterbirds and upland birds:

- *Local Study Area* (LSA) — Includes the Goose Property and Marine Laydown Area (MLA)

Potential Development Areas (PDA); connecting winter ice roads; and the George exploration camp area, in addition to sub-watershed areas used as the LSA boundary where watersheds encompassed proposed project components and were considered as large as areas of potential loss or degradation, for a total assessment area of 134, 369 hectares (ha).

- *Regional Study Area* (RSA) — Includes the Goose Property and MLA PDAs; the LSA; and a 35 kilometre (km) buffer on either side of all proposed infrastructure and connecting winter ice road corridors for a total assessment area of 1,262,005 ha.

Sabina identified the following two (2) spatial boundaries for its assessment of potential project-induced impacts on seabirds and seaducks:

- *Marine Local Study Area* (LSA) — Includes the MLA PDA, a one (1) km buffer around the MLA PDA, a 15 km section of shoreline immediately south of the MLA PDA, and the proposed winter ice road crossing the connecting inlet, for a total assessment area of 2,100 ha.
- *Marine Regional Study Area* (RSA) – Includes the marine LSA, the marine areas from the southernmost tip of the inlet up to approximately 15 km north of Omingmaktok (Bay Chimo), in addition to a 75-km east-west boundary width, for a total assessment area of 299,971 ha.

The temporal boundaries identified in Sabina's bird and bird habitat assessment aligned with all Project phases including mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

Sabina selected sustained population health as the key criterion to assess potential project-induced residual effects for all wildlife VECs. To evaluate this criterion, Sabina identified eight (8) potential effects that may occur through the interaction of migratory bird and raptor species with project components, and six (6) potential effects that may occur for seabirds and seaducks. The potential effects, developed from relevant scientific literature, professional judgement, experience at similar projects in Nunavut and the Northwest Territories, and Traditional Knowledge, included: habitat loss, disturbance due to noise, disruption to movement, direct mortality and injury, indirect mortality, attraction, exposure to contaminants, and reduction in reproductive productivity (due to all effects of the Project combined). All effects identified were identical for Sabina's assessment of seabirds and seaducks, except for the omission of attraction and disruption to movement, and the analysis of habitat alteration as opposed to habitat loss. The potential effects identified were assessed in relation to proposed project components in the Goose Property and MLA, including open pits, camp, plant, landfill, and airstrip sites; winter and access road infrastructure; stockpiles, waste rock, tailings, and explosives storage areas; quarries; barge landing area; and other smaller infrastructure (e.g., diversion channels, water intakes, and interception ditches). Sabina noted that potential effects on seabirds and seaducks were assessed only in relation to project activities at the MLA, including air traffic, construction and operations, and shipping within the marine RSA.

In the analysis of potential project-induced effects on wildlife VECs, Sabina considered mitigation, monitoring, and adaptive management measures included in its Wildlife Mitigation and Monitoring Plan designed to reduce or eliminate potential effects on wildlife (Volume 10, Section 20). Measures proposed to mitigate potential impacts to wildlife included: optimized project design measures to site infrastructure away from sensitive wildlife areas (e.g., moulting, staging, nesting areas); measures to reduce dustfall from operations and storage areas; measures to design and maintain infrastructure to exclude wildlife; specific waste and chemical management protocols; noise abatement and attraction

reduction measures; use of open-water shipping; use of underground mining; incorporation of best management practices such as work stoppages around sensitive wildlife temporal periods; aircraft flight restrictions and vehicle operations restrictions; and the incorporation of adaptive management protocols based on results from facility-specific and species-specific monitoring programs. Information pertaining to Sabina's Wildlife Mitigation and Monitoring Plan, as well as other management plans containing wildlife-related mitigation measures, was provided in Volume 10 of the FEIS.

Waterbirds and Upland Birds

Sabina's assessment of potential project-induced effects on waterbirds and upland birds resulted in the predicted occurrence of two (2) residual effects: habitat loss and disturbance. Based on modelling results, Sabina noted that waterbird and upland bird habitat loss would account for 0.6% (2,489 ha) and 0.5% (4,905 ha) of the suitable habitat available within the wildlife RSA for the respective migratory bird species. Sabina indicated that these losses would occur as a result of construction and operations activities within the PDAs. Sabina estimated, using baseline population data and habitat suitability modelling, that this would cause the displacement of an estimated 617 of 842 upland bird breeding pairs within the two PDAs, representing approximately 0.5% of the estimated population size within the wildlife RSA. Sabina indicated that relatively few waterbirds, and no key staging sites, were observed within the PDAs during baseline studies and that therefore, few would be expected to experience habitat loss. Sabina predicted that waterbird and upland bird habitat loss due to noise disturbance outside the PDAs would be less than one percent (1%) of their respective suitable habitat available within the wildlife RSA. Noise modelling for wildlife was based on the estimation of potential zones of influence (ZOI) around project activities and components, and the calculation of potential noise levels in those areas in excess of:

- 108 decibels (dB, instantaneous noise);
- 180 dB for blasting;
- 45 dBA (continuous noise) for general project noise; and
- 80 dBA for aircraft noise.

Sabina noted that ZOIs, and the respective thresholds, were established based on relevant scientific literature and regulatory noise level guidelines. Sabina used noise modelling values from Year 3 of operations for its assessment, as it was identified as the year when overall project noise would be at its highest and could represent worst-case noise conditions. Sabina noted that one (1) key waterbird staging site was observed within the disturbed areas outside of the PDAs and no measurable effects on movements or distribution of waterbirds were discovered resulting from project activities.

Sabina predicted that the magnitude of both potential residual effects for waterbirds and upland birds would be low, sporadic in nature, of medium-term duration (confined to the life of the Project) for disturbance, and long-term duration for habitat loss. All potential residual effects were further predicted to be reversible, except for habitat loss in specific areas of the project footprint. Sabina predicted, contingent on the application of mitigation measures, that the potential residual effects for migratory birds would be not significant. Sabina determined that no migratory birds would be expected to interact regularly with other projects and thus predicted that no cumulative or transboundary effects would be expected.

Raptors

Sabina's assessment of potential project-induced effects on raptors resulted in the predicted occurrence

of five (5) residual effects: habitat loss, disturbance due to noise, direct mortality and injury, attraction, and reduced reproductive productivity. Using a quantitative habitat suitability model, Sabina noted that high-quality habitat lost as a result of construction activities within the PDAs would total 0.8% (633.5 ha) of the available high-quality habitat available in the wildlife RSA for cliff-nesting raptors, and 0.7% (2,806.4 ha) for short-eared owl. Based on noise modelling using the same methodology as the waterbirds and upland birds' assessment, Sabina predicted that a total of 1,136 ha of suitable cliff-nesting raptor habitat and 2,072 ha of suitable short-eared owl nesting habitat may be affected by noise impacts outside of the PDAs. These values would represent less than 1.5% of the total suitable habitat available in the wildlife RSA for both raptor groups. Sabina noted that proposed mitigation measures would be expected to greatly lower, and likely eliminate, the effect of mortality and injury on raptors; however, it was identified as a residual effect in its assessment due to regulatory concern for the species. Sabina indicated that attraction was identified as a potential residual effect in its assessment based on evidence from similar northern mines indicating that open pit walls consistently attract cliff-nesting raptors. Sabina identified 16 nesting raptor pairs that could be impacted by habitat loss, sensory disturbance, direct mortality, and attraction, therefore potentially resulting in a reduction of their reproductive productivity.

Sabina predicted that all five (5) residual effects for raptor species would be low in magnitude, of medium-term duration, and reversible (or reversible with effort), except for habitat loss which would have long-term duration within specific areas of the project footprint and irreversible.

Sabina further described the predicted effects as being sporadic in nature and confined within the PDAs (habitat loss and attraction) and the LSA (disturbance, direct mortality, injury, and reduction in reproductive productivity). Sabina predicted, contingent on the application of mitigation measures, that the potential residual effects for raptors would be not significant. Sabina indicated that due to the limited spatial extent of the residual effects, no cumulative or transboundary effects would be expected.

Seabirds and Seaducks

Sabina's assessment of potential project-induced effects on seabirds and seaducks resulted in the predicted occurrence of two (2) residual effects: disturbance due to noise and reduction in reproductive productivity. Sabina indicated that seasonal vessel traffic and air traffic would be expected to impact seabirds and seaducks, potentially causing behavioural reactions such as alert posturing, flushing, and temporary avoidance of habitats. Sabina noted in its assessment that no quantitative noise threshold values are available for vessel noise for seabirds and seaducks, and that therefore its assessment was based on qualitative analysis. Sabina stated that disturbance from vessel traffic would be expected during moulting and staging periods (mid-July to early-October). Sabina indicated that while habitat functionality may be lost due to ship disturbance, based on relevant observational data, avoidance responses for seabirds and seaducks would be temporary and some habituation would be expected. Based on noise modelling results, Sabina estimated that 28,874 ha of marine habitat would be disturbed due to air traffic noise, representing 10% of the marine wildlife RSA. Sabina noted that disruption due to passing vessels and aircrafts during the operational window of the MLA could impact female and juvenile fitness in seabirds and seaducks, which could in turn affect the reproductive health of subsequent generations.

Sabina predicted that both potential residual effects would be of moderate to low magnitude, medium duration (confined to the life of the Project), sporadic in nature, confined to within the marine RSA, and reversible. Sabina rated the potential effects as not significant, contingent on the application of mitigation measures.

Due to the predicted occurrence of residual effects, Sabina conducted a cumulative effects assessment using the marine RSA as a spatial boundary which was estimated to encompass an area that all habitat seaducks and seabirds would frequent within their occupational range. Sabina identified two (2) reasonably foreseeable future projects (Bathurst Inlet Port and Road (BIPR) and the Hackett River Project) that could occur within the marine RSA, both that would involve shipping through Bathurst Inlet. Sabina determined that noise from the Back River Project and the BIPR project would cumulatively disturb 11% of the marine RSA and could potentially lead to a decrease in the population of seabirds and seaducks in the regional area due to a reduction in reproductive productivity.

Sabina determined that the cumulative residual effects would be of low magnitude, medium duration (confined to the life of the Project), sporadic in nature, confined to within the marine RSA, and reversible. Sabina noted that intermittent flights and mitigation measures to avoid known staging areas contributed to its determination that the magnitude of the residual effects would be low. Sabina further noted that due to the expected confinement of all potential residual effects to within the RSA, no transboundary effects would be expected.

As part of the FEIS Addendum, Sabina submitted a revised Wildlife Mitigation and Monitoring Program Plan (WMMPP; Version 7), which included updated mitigation, monitoring, and adaptive management protocols developed prior to, during, and following the 2016 Final Hearing with relevant parties, communities, focus groups, and technical experts.

Prior to, and again during the supplemental Final Hearing, Sabina submitted Version 8 of the WMMPP to the NIRB and parties, which included revisions to address comments provided during the technical review of the FEIS Addendum and during the NIRB's Technical Meeting held via teleconference prior to the supplemental Final Hearing.[645] Revisions included as part of Version 8 of the WMMPP consisted of updated and clarified mitigation, monitoring, and/or adaptive management measures for terrestrial and marine wildlife including:

- Winter ice road operations, monitoring, and adaptive management protocols;
- Helicopter operations and aircraft monitoring measures;
- Clarification on terminology and definitions;
- Zone of influence monitoring and associated adaptive management protocols;
- Transportation and marine shipping considerations;
- Species at risk identification and management details;
- Vegetation monitoring details;
- Raptor avoidance protocols and consultation procedures;
- Updates to proposed operational shutdown protocols and collaboration measures;
- Camera monitoring design;
- Water monitoring and waterbird exclusion protocols;
- Marine bird and waterbird monitoring protocols and collaboration commitments; and

[645] Sabina Gold & Silver Corp., Exhibit 17, NIRB supplemental Final Hearing File No. 12MN036, May 31, 2017.

- Details regarding the establishment and function of a Caribou Technical Advisory Group.

At the supplemental Final Hearing Sabina also provided an updated document with existing, updated, and new recommended terms and conditions, as well as commitments, developed in consultation with relevant parties, which included commitments related to the protection of bird species and other wildlife.[646]

For additional discussions related to wildlife see Section 4.11: Terrestrial Wildlife and Wildlife Habitat.

4.12.2 Views and Concerns of Interested Parties

Within the parties' respective 2016 final written submissions, the Government of Nunavut (GN)[647] and Environment and Climate Change Canada (ECCC)[648] commented on the high degree of confidence assigned by Sabina to the significance ratings in the FEIS for the assessment and monitoring of raptors. The GN noted that the aerial surveys used to collect data on the locations of raptor nests and use of locations of known active nest sites to estimate the potential effects of disturbance on raptors could be subject to bias. The GN stated that the nest site locations identified through the aerial surveys would be unlikely to represent all active nests within the Regional Study Area as the spatial coverage of the surveys differed by year. The GN further stated that its confidence in Sabina's significance determinations for habitat loss, disturbance, and reproductive productivity were moderate, moderate, and low, respectively. The GN concluded that as a result of the methods used, the potential habitat loss and disturbance would have been underestimated and recommended that Sabina revise its methods used in the effects assessment. ECCC similarly commented on the proposed use of aerial surveys within the Wildlife Effects Monitoring Program to monitor migratory birds, specifically waterbirds, seabirds, and seaducks and raised concerns that the programs would not achieve their proposed objectives. ECCC stated that the small survey areas, natural low breeding densities, low sampling effort, and the influence of survey timing and environmental conditions on results would impact the proposed survey's power to detect change. ECCC recommended that Sabina consult with ECCC regarding the migratory bird monitoring priorities and reporting and revise the Wildlife Mitigation and Monitoring Program Plan (WMMPP) accordingly. Within its response to the GN's 2016 final written submissions, Sabina outlined the baseline and aerial surveys, methodologies used, analysis conducted, and conclusions drawn. Sabina clarified that

> *In important areas, such as the Goose PDA and MLA that was surveyed twice in each of four and three baseline years, respectively, Sabina is confident that all raptor nests within these areas were recorded. It should be noted that there is very little cliff habitat in the immediate area of either the Goose Potential Development Area or the Marine Laydown Area, which increases the confidence that all nests were recorded. …*
>
> *The raptor effects assessment predicts that one raptor nest (or up to two nests) will be affected by the Project through disturbance to noise. Within the context of the population of raptors in the RSA, the predicted effects on raptors due to the Project will be Not Significant.*[649]

[646] Sabina Gold & Silver Corp., Exhibit 45, NIRB supplemental Final Hearing File No. 12MN036, June 1, 2017.
[647] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.
[648] Environment and Climate Change Canada, 2016 Final Written Submission, March 9, 2016.
[649] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016, pp. 209-210.

In a joint submission submitted by Sabina and the GN during the 2016 Final Hearing, containing agreed-upon suggested commitments, the GN withdrew its previous recommendation that Sabina revise the methods used in the effects assessment regarding potential habitat loss and disturbance of raptors.[650] In its response to ECCC's 2016 final written submission, Sabina committed to consulting with ECCC and updating its WMMPP to include ECCC as a consulting party regarding wildlife mitigation measures. During the 2016 Final Hearing, ECCC indicated that it had no outstanding concerns.[651]

The GN also commented on Sabina's proposed measures to minimize disturbance to nesting raptors and highlighted requirements within the *Nunavut Wildlife Act* associated with removal of raptor nests and the use of deterrents to prevent raptors from nesting. The GN recommended that the Project's management plans, particularly the WMMPP, be revised to clarify that the Proponent would contact the GN – Department of Environment (GN-DOE) to determine the appropriate action and obtain the required permits prior to undertaking activities that could result in the destruction or deterrence of raptor nests. Sabina incorporated the GN's recommendations into its revised WMMPP, submitted to the NIRB on April 11, 2016. ECCC similarly discussed Sabina's proposed mitigation measures to minimize the risk of incidental take of migratory birds and noted that pre-clearing nest surveys should be conducted less than 14 days prior to land clearing activities as a consideration for the short nesting cycle of arctic-nesting birds. ECCC further recommended that the setback distances for tundra-nesting birds, previously provided to Sabina, be incorporated into the WMMPP. During the 2016 Final Hearing, the GN noted that the wording and associated commitments within Sabina's response to the 2016 final written submissions was not reflected within the updated WMMPP:

> *I did refer to that last night and reviewed it, and as I was saying, it doesn't exactly reflect the language of your response, your written response to the GN; so we did have just an outstanding concern that it's not quite the same.* [652]

During its presentation at the Community Roundtable at the 2016 Final Hearing, the GN noted that:

> *We agree with the language in the proponent's response to obtain permits prior to undertaking activities to deter raptors or removing raptor nests, and this should be clearly reflected in the Wildlife Mitigation and Monitoring Plan*[653] *to satisfy the government's concern.* [654]

In a joint submission submitted during the 2016 Final Hearing by Sabina and the GN that contained agreed-upon suggested commitments, the following associated commitment was:

> The Proponent will update the WMMP Plan to include the following commitment:
>
> Prior to removal or deterrence of raptors, the Proponent will contact GN-DOE to discuss proposed mitigation options, as listed in the WMMP Plan, and will obtain the required permit

[650] Sabina Gold & Silver Corp. and Government of Nunavut, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016, p. 5.
[651] J.F. Dufour, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 452, lines 6-20.
[652] S. Atkinson, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 427, lines 1-6.
[653] Throughout the commenting periods and at the Final Hearings, select parties referred to the Wildlife Mitigation and Monitoring Program Plan as the Wildlife Mitigation and Monitoring Plan.
[654] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1116, lines 1-6.

prior to undertaking any activity that can lead to the destruction of raptor nests or the deterring of raptors from nesting sites.[655]

ECCC noted that it was satisfied with Sabina's response to its 2016 final written submissions and the associated revisions made to the WMMPP, including the "*proper hierarchy or sequence of mitigation measures that should be followed*", and the length of time between pre-clearing surveys and land-clearing activities.[656]

Within its 2016 final written submission, ECCC discussed the potential for waterbirds to use the Tailings Storage Facility (TSF) and associated water storage areas and raised concerns that the current time lag between water testing and subsequent results needed to inform waterbird monitoring measures increases the potential exposure period and risk of contamination. ECCC recommended that Sabina record waterbird use of the TSF and other water storage areas concurrently with water sampling to allow timely implementation of exclusion measures. Within its response to final written commitments, Sabina committed to concurrently monitor waterbird activity within the TSF and other water storage areas during water quality sampling and updated its WMMPP accordingly. During the 2016 Final Hearing, ECCC noted that it was satisfied with Sabina's response and commitment to update its WMMPP.[657]

ECCC also commented on Sabina's residual and cumulative effects assessment on seabirds and seaducks related to potential ship disturbances and related proposed mitigation and monitoring measures. ECCC noted that although Sabina's commitment to mitigate and minimize disturbance to marine birds is acknowledged, particularly in marine key habitat sites and along the shipping route, not all key habitat sites can be avoided. ECCC recommended that Sabina and its shipping contractors employ marine setbacks consistent with its input to the Nunavut Planning Commission regarding key habitat sites for migratory birds in the Nunavut Settlement Area while transiting through Bathurst/Elu Inlet, Lambert Channel, and Eastern Lancaster Sound. ECCC further recommended that Sabina meet with ECCC prior to the construction phase to discuss migratory bird monitoring priorities and proposed surveys and objectives in the Wildlife Effects Monitoring Program. Sabina incorporated within its revised WMMPP ECCC's recommendations with regards to the marine setback distance of 500 metres from seaduck colonies and moulting aggregations of seaducks and waterfowl while transiting through the areas noted above. Sabina further committed to collaborating with relevant parties on relevant research on the cumulative effects of shipping including marine birds. During its presentation at the Community Roundtable at the 2016 Final Hearing, ECCC discussed mitigation and monitoring commitments made by Sabina with regards to potential disturbances to marine birds in sensitive areas due to shipping and Sabina's preparedness to respond to pollution events affecting migratory birds from shipping activities at the Marine Laydown Area. ECCC outlined commitments, including: avoidance of sensitive areas and ship based monitoring; changes made to the WMMPP; provision of further assessments related to spill

[655] Sabina Gold & Silver Corp. and Government of Nunavut, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016, p. 5.
[656] J.F. Dufour, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 450, lines 10-25.
[657] J.F. Dufour, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 451, lines 13-16.

prevention and preparedness; and providing contracted shipping companies with relevant mitigation measures related to marine birds and mammals. ECCC noted no outstanding concerns.[658]

Lastly within its 2016 final written submission, ECCC commented on potential project-effects related to species at risk, including the Peregrine Falcon, Short-eared Owl, Red Knot, and Red-necked Phalarope and associated mitigation and monitoring requirements pursuant to the *Species at Risk Act.* During the 2016 Final Hearing, ECCC further discussed avian species at risk that could interact with project vessels along the proposed shipping route. ECCC concluded that it had recommended some general mitigation measures for all species at risk, which were incorporated into the revised WMMPP.[659]

During the 2016 Final Hearing, a Community Representative from Gjoa Haven discussed a meeting he attended with regards to the Ahiak caribou herd, noting that discussions arose regarding migrating birds and that

> *There are studies done on the birds that migrate as to where they go to when they leave the north and how far they travel to the north.*[660]

In response to a deferred question by Board staff on whether exploration at Sabina's mining leases were included within its cumulative effects assessment, Sabina clarified that

The Wildlife Mitigation and Monitoring Plan includes provisions for managing potential effects of exploration on wildlife with a focus on potential helicopter effects due to helicopters potential effects on large mammals and birds within the regional study area and beyond … There are also setbacks for aggregations of breeding birds and dens of other important wildlife future. As we said on the first day of the meeting, Sabina's attention is focused on the Back River Project. We also continue -- will continue some exploration at the George Property. We have not conducted exploration drilling at the Wishbone property since 2012 and currently have no intentions of doing that any time soon. Our consideration for helicopter and drilling activity covered all of our exploration activities in the region. [661]

In its final written submission on the FEIS Addendum, the Government of Nunavut (GN) noted several concerns associated with Sabina's proposed mitigation and management measures related to raptors contained within the revised Wildlife Mitigation and Monitoring Program Plan (WMMPP). The GN noted that the proposed helicopter avoidance buffer of 300 metres (m) was inconsistent with the 1.5 kilometre (km) distance stated in the FEIS, and recommended that the WMMPP reflect the 1.5 km buffer, consistent with Indigenous and Northern Affairs Canada's *Northern Land Use Guidelines for Seismic Operations*. The GN also commented on Sabina's inclusion of management measures related to potential direct mortality and injury of raptors. The GN recommended that Sabina revise the WMMPP to reflect commitments made by Sabina during the 2016 Final Hearing that it would obtain appropriate permits prior to conducting any, and all activities listed as management measures to prevent mortality to raptors in open pits and quarries. The GN further commented on Sabina's proposed pit and quarry wall nest monitoring protocols, and requested, in accordance with Sabina's commitments during the

[658] J.F. Dufour, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1155, lines 3-22.
[659] J.F. Dufour, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 452-454.
[660] B. Putuguq, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1291, lines 6-9.
[661] M. Pickard, Sabina Gold & Silver Corp., 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1062-1063, lines 24-26 and 1-17.

2016 Final Hearing, that the WMMPP be updated to clarify that Sabina would contact the GN – Department of Environment to discuss the proposed mitigation options related to pit and quarry wall nest management, and would obtain the required permits prior to undertaking any activity that could lead to the destruction of raptor nests or the deterrence of raptors from nesting sites.

In the response to final written submission on the FEIS Addendum, Sabina provided the rationale for various mitigation and management measures related to raptors, and provided clarity regarding updates it would make to the WMMPP to address the GN's concerns. Sabina noted that it did not agree with the GN's recommendation to increase the helicopter avoidance buffer for raptors to 1.5 km, and stated that the 1.5 km buffer is the setback distance for unknown species in the Northern Land Use Guidelines, and that the 1.5 km value was used in its assessment to evaluate potential combined effects of the Project. Sabina clarified that the Northern Land Use Guidelines for seismic operations advises a 650 m helicopter setback distance for raptors and committed to updating this value within the WMMPP. Sabina agreed to the GN's recommendations that it should seek collaborative advice from the GN to discuss proposed mitigation and management options related to raptors and obtain required permits prior to any of the relevant management activities. Sabina highlighted a proposed term and condition or commitment submitted during the 2016 Final Hearing as well as a newly proposed term and condition or commitment consistent with its responses related to raptor management, collaboration with the GN, and required permit acquisitions.

During the supplemental Final Hearing, the GN noted that its concerns were addressed through the revisions Sabina included within Version 8 of the WMMPP.[662]

In its final written submission on the FEIS Addendum, Environment and Climate Change Canada (ECCC) noted that aspects of the revised WMMPP did not adequately reflect previous commitments made by the Proponent in regard to migratory birds. ECCC discussed discrepancies related to the timeframe between pre-clearing nest surveys and land clearing activities, monitoring of waterbird use of the Tailings Storage Facility and other water storage areas, and ship-based marine bird monitoring and aerial surveys. ECCC recommended that Sabina update the WMMPP to include: prior commitments, as well as consider monitoring the use of mine-altered waterbodies by waterbirds independently of water quality monitoring; clarification on proposed monitoring, sampling effort, and triggers for adaptive management; clarification that methods for monitoring marine birds during shipping are consistent with ECCC's *Eastern Canada Seabirds at Sea* standardized protocols; and commit to engaging with ECCC and other parties on regional monitoring priorities, objectives, and methods for waterbird and marine bird valued ecosystemic components.

In its response to final written submissions on the FEIS Addendum, Sabina agreed to several recommendations provided by ECCC. Sabina committed to updating the WMMPP to include specific procedures for pre-construction surveys for nests, as well as measures for monitoring the use of mine-altered waterbodies by waterbirds and shore birds independent of water quality monitoring. Sabina indicated that it had already committed to monitoring marine mammals and birds during proposed shipping through the Northwest Passage by ship crew using simplified protocols based on the *Eastern Canada Seabirds at Sea* standardized protocols. Sabina clarified that it had also committed to working collaboratively with ECCC to discuss monitoring programs prior to construction, including monitoring cumulative effects on marine birds, however, based on its proposed shipping frequency and its hope to

[662] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 448-449, lines 26 and 1-16.

share vessels with other Northern users, details of the marine bird monitoring program would need to be further discussed with ECCC. Sabina also committed to meeting with ECCC and other interested parties prior to construction or first shipment on regional monitoring priorities, objectives, and methods for waterbird and marine bird valued ecosystemic components.

In its final written submissions on the FEIS Addendum, ECCC also provided recommendations to be used during the planned fish-out programs to mitigate the potential for diving-bird entanglement in gill nets. ECCC requested further details on the proposed mitigation measures (e.g., increasing visibility of gill nets, the use of bird deterrents) as well as further details on reporting, triggers, and adaptive management. In its response to ECCC's submission, Sabina indicated that it would use both noise (bear bangers and screamers when birds sighted) and visual (predatory bird decoys) stimuli to deter migratory water birds during the fish-out of lakes. Sabina added that daily records of bird activity would be taken during fish-out activities and used to adapt the management strategies accordingly. Sabina proposed a new corresponding term and condition or commitment, requiring Sabina to engage with ECCC during the development of the fish-out plan to ensure adequate and appropriate protection measures are in place for birds.

During the supplemental Final Hearing, ECCC noted that its concerns were addressed and that it had no further concerns.[663] ECCC noted that some edits to the WMMPP related to monitoring the use of mine-altered waterbodies by water birds and shorebirds independent of water quality monitoring were outstanding, though it was satisfied with Sabina's commitment to incorporate the requested changes and had no further concerns.[664]

For additional discussions related to wildlife raised during the assessment of the FEIS Addendum, see Section 4.11: Terrestrial Wildlife and Wildlife Habitat.

4.12.3 Views of the Board

As noted within the 2016 Final Hearing Report, the Board continues to be supportive of the recommendations put forward by parties, and continues to agree that reasonable mitigation and monitoring measures would prevent impacts to birds and bird habitat from the Project. The Board acknowledges and appreciates the collaboration that took place between the Proponent and intervening parties throughout the Review of the Project and notes that issues related to birds and bird habitat were largely resolved by the Proponent's commitments and proposed mitigation and management plans. The Board also acknowledges the refinements and further commitments incorporated within Sabina's Wildlife Mitigation and Monitoring Program Plan for the protection of birds and bird habitat following the 2016 Final Hearing.

As identified through Sabina's baseline studies and by intervening parties through the Review of the Project, the project area is frequented and inhabited by a variety of waterbird, upland bird, raptor, seabird, and seaduck species. During the 2016 Final Hearing the Board asked Environment and Climate Change Canada (ECCC) representatives whether they had identified concerns with birds or wildlife being attracted to tailings storage areas and whether Sabina had addressed sources of potential attraction to

[663] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017 pp. 478-482, lines 14-26, 1-26, 1-26, 1-26, and 1-8.
[664] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 480-481, lines 18-26 and 1.

ECCC's satisfaction.[665] In response, ECCC outlined that it initially raised concerns with the Proponent regarding the potential for birds to be attracted to the tailing areas; however, through discussions and responses received it was satisfied that the level of mitigation and monitoring proposed would be capable of managing any potential impacts accordingly.[666] As previously noted, the Board stresses the importance of further investigating best practices and strategies for discouraging all bird populations interacting with proposed tailings storage areas and other project infrastructure, as well as project-related activities, throughout the duration of the Project.

The Board continues to believe that a precautionary approach that incorporates local knowledge and scientific guidance should be applied to mitigation, monitoring, and management plans associated with migratory birds. Inuit and residents of Canada outside of Nunavut place a great deal of importance on the continued health of many species that breed annually in arctic ecosystems and that are harvested for human consumption. As such, the Board reiterates that additional efforts should be employed to demonstrate that industrial activities associated with the Project (e.g., Tailings Storage Facility) would not adversely affect wildlife that might come in contact with them, and would not lead to the contamination of a food source for local communities.

4.12.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to bird and bird habitat could be appropriately managed through the commitments provided by the Proponent and compliance with the following key mitigation and monitoring terms and conditions (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Inclusion of mitigation and monitoring measures for birds and bird habitat in the Project's Wildlife Mitigation and Monitoring Program Plan;
- Outlining that avoidance should be the primary mitigation measure applicable to birds, eggs or nests of Species at Risk and that zones of avoidance be established around these areas;
- Updating and maintaining Species at Risk measures to ensure these measures are consistent with any applicable status reports, recovery strategies, action plans, and management plans throughout the Project;
- Imposing limits on and mitigation of ground disturbance (e.g. clearing) during seasonal return of migratory birds to the project area;
- Specifying that the Government of Nunavut – Department of Environment must be contacted and consulted prior to any removal or deterrence of raptors;
- Confirming that measures will be included within the Wildlife Mitigation and Monitoring Program Plan to ensure that appropriate setback distances (500 metres) will be maintained from

[665] E. Copland, Board Chairperson, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1187, lines 18-24.
[666] L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1187-1188, lines 25-26 and 1-9.

colonies and moulting aggregations of seaducks and waterfowl during Project shipping through Bathurst/Elu Inlet, Lambert Channel, and Eastern Lancaster Sound;

- Recording and reporting any incidents of bird mortalities associated with project activities are recorded and reported to regulatory authorities;
- Ensuring that project aircraft maintain sufficient cruising altitudes to avoid disturbance to wildlife, including migratory birds; and
- Ensuring that pilots are informed of minimum cruising altitude guidelines and maintain daily logs or records of flight paths and cruising altitudes for project aircraft.

4.13 MARINE ENVIRONMENT

4.13.1 Views of the Proponent

Sabina provided its assessment of potential project-induced effects on the marine environment in Volume 7, Sections 1, 2, and 3 of the FEIS. Sabina identified marine physical processes, marine water quality, and marine sediment quality, respectively, as focus areas for its assessment of the marine environment. Supporting baseline information, collected through physical oceanographic studies, sediment grab sampling studies, under-ice Niskin studies, and open water bottle sampling studies, was provided in Appendices V7-1A, V7-2A, and V7-6A.

Sabina's assessment of potential project-induced effects on the marine environment resulted in the predicted occurrence of:

- Three (3) residual effects for marine water quality (shipping activities (propeller wash), runoff, and site contact water); and
- Three (3) residual effects for marine sediment quality (sediment changes due to shipping (propeller wash), sediment introduction to the marine environment, and sediment changes due to site contact water).

Sabina predicted, contingent on the application of mitigation measures, that the significance of all potential residual effects would be not significant. Due to the limited spatial extent of the predicted residual effects, Sabina did not expect the residual effects identified to the marine environment to contribute cumulatively with other projects, or to create any transboundary impacts.

Sabina identified the following two (2) spatial boundaries for its assessment of potential project-induced impacts on the marine environment:

- *Marine Local Study Area* (LSA) — Includes the Marine Laydown Area (MLA) Potential Development Area (PDA); a one (1) kilometre (km) buffer around the MLA PDA; a 15 km section of near-shore marine waters and shoreline immediately south of the MLA PDA; and the proposed winter ice road crossing the connecting inlet, for a total assessment area of 2,100 hectares (ha).
- *Marine Regional Study Area* (RSA) – Includes the marine LSA; marine areas from the southernmost tip of the Bathurst Inlet up to approximately 15 km north of Omingmaktok; and a 75-km east-west boundary width, for a total assessment area of 299,971 ha.

The temporal boundaries identified in Sabina's assessment aligned with all project phases, including mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

Resulting from baseline studies, Sabina described sea-ice conditions in Bathurst Inlet as being 1.5-2 metres (m) thick on average, with coverage usually occurring from October to June before seasonal break-up by early July. Tidal elevations in Bathurst Inlet were estimated to have maximum amplitudes less than 0.5 m. Sabina indicated that the water column structure (salinity and temperature) in the inlet consists of a two (2)-layer stratified system during the open-water season with a 15-20 m warmer, fresher, and more oxygenated top layer above a colder, saltier, and lower oxygenated bottom layer. Estuarine flow and winter water column stratification were noted to be highly influenced by freshwater inflows, or lack of inflows during the ice season, from river systems in the area (see Section 2.1.1: Biophysical Conditions).

For its assessment of potential project-induced effects on marine water and sediment quality, Sabina identified seven (7) project component groups with the potential to interact with either of the valued components. The project interaction groups identified in Sabina's assessment were: shipping activities, mobilization, construction, and decommissioning activities; site contact water; fuels, oils and polycyclic aromatic hydrocarbons (PAH); discharges; and dust deposition. All project groups identified were linked with potential interaction pathways and were analyzed using indicators derived from Canadian Council of Ministers of the Environment (CCME) contaminants of potential concern (COPC) thresholds for marine water and marine sediment quality, when available. For its assessment of both marine water quality and sediment quality, Sabina identified potential pathways for project interactions through: runoff, discharge, and contact through activities in the marine environment; physical effects of activities in the marine environment; and aerial deposition.

Within its analysis, Sabina considered mitigation, monitoring, and adaptive management measures included in its Aquatic Effects Management Plan, Site Water Monitoring and Management Plan, and other plans contained in Volume 10 of the FEIS. Measures proposed to mitigate potential impacts to the marine environment included: measures to manage impacts from vessels such as vessel wakes, propeller wash, and antifouling agents; optimized project design measures to reduce sediment displacement; use of geochemically suitable material; measures to develop and maintain water management infrastructure; specific waste and chemical management protocols; adoption of regulatory and industry best practice protocols for the construction of ice bridges and winter ice roads and the management of discharges; and the incorporation of adaptive management protocols based on results from facility-specific and activity-specific monitoring programs.

For its assessment of project-induced effects on marine water quality, Sabina considered the following indicators, derived from CCME Water Quality Guidelines for the Protection of Aquatic Life where possible:

- pH
- Total suspended solids (TSS)
- Nutrients
- Metals
- Hydrocarbons

- Other indicators (dissolved oxygen, biological oxygen demand, tributyltin, salinity)

Sabina's assessment resulted in the predicted occurrence of three (3) potential residual effects for marine water quality: shipping activities (propeller wash), mobilization, construction, and decommissioning activities (runoff), and site contact water.

Sabina indicated that baseline studies revealed elevated metal concentrations for both water quality and sediment quality indicators based on CCME guidelines; therefore it assumed that metal concentrations are naturally elevated and would not likely be impacted by sediment disruption and mixing. Sabina predicted that wash from propellers of large vessels could disturb marine sediments and could result in an increase of TSS in the water column resulting in the exchange of nutrients and metals between mediums. Sabina also noted that propeller wash for vessels operating in waters greater than 10 to 20 m of depth would be within the range of natural variability for sediment disruption, and that all portions of the shipping route would exceed this depth save for sections in the PDA.

Sabina identified runoff as the primary interaction pathway between project activities in the mobilization and preconstruction interaction group and the marine environment. Sabina stated that site runoff into marine waterbodies could be possible during early stages of site development before water management structures would be fully developed. Sabina furthered this point and stated that only small inputs of runoff would be expected to reach the marine environment and that any runoff from cleared areas once construction was completed would be fully mitigated. Sabina noted that site contact water would have the potential to increase the transport of suspended solids and metals due to contact with exposed geological material during high periods of runoff. Sabina indicated that increased concentrations of suspended sediment in the receiving marine environment could increase baseline values, but would not be expected to exceed natural variation. Based on a geochemical assessment of pad and road-building materials, Sabina predicted that all metal concentrations from parameters used in its assessment would be below CCME marine water quality guidelines for site contact water, with the exception of arsenic. Sabina predicted, however, that the sporadic inputs of arsenic in runoff would be transient and concentrations would rapidly decrease though natural mixing, adsorption, and settling.

Sabina predicted that the potential residual effects on marine water quality would be low in magnitude, reversible, sporadic in nature, of short to medium-term duration (confined to the life of the Project) and confined to the marine LSA. Sabina predicted, contingent on the application of mitigation measures, that the potential residual effects would be not significant. Sabina stated that no transboundary or cumulative effects would be expected, based on the limited spatial extent of the predicted residual effects.

For its assessment of project-induced effects on marine sediment quality, Sabina considered the following indicators where possible, derived from interim CCME Marine Sediment Quality Guidelines for the Protection of Aquatic Life:

- Particle size
- Total organic carbon (TOC)
- Metals
- Hydrocarbon

Sabina's assessment resulted in the predicted occurrence of three (3) residual effects for marine

sediment quality: sediment quality changes due to shipping (propeller wash); sediment introduction to the marine environment (mobilization, construction, and decommissioning activities); and marine sediment quality changes due to site contact water.

Sabina stated that propeller wash resulting in sediment quality changes was selected as a potential residual effect based on the potential for impacts to occur from vessel operations in the MLA PDA. Similar to marine water quality, Sabina determined that propeller wash in all other portions of the proposed shipping route would not cause impacts that would exceed natural variation. Sabina indicated that changes to particle size due to the runoff of site contact water would not be expected to alter sediment composition in the near-shore environment of the MLA PDA due to natural dispersion processes identified during baseline studies. Similar to its assessment of marine water quality, Sabina noted that arsenic in runoff would be rapidly diluted in the receiving environment and would not be expected to contribute to elevated concentrations beyond the surf zone along the MLA shoreline.

Based on the conclusions noted above, Sabina predicted the magnitude of the anticipated residual effects would be low, sporadic in nature, reversible, of short to medium-term duration (confined to the life of the Project), and confined to within the marine LSA. Sabina predicted, contingent on the application of mitigation measures, that the potential residual effects would be not significant. Based on the limited spatial extent of the predicted residual effects, Sabina stated that no transboundary or cumulative effects would be expected.

In Volume 7.2 (incorrectly labelled as 7.4) of the FEIS Addendum, Sabina addressed the Board's uncertainty, as expressed in the 2016 Final Hearing Report, regarding potential effects to marine water quality from the discharge of saline water at the Marine Laydown Area (MLA). Sabina noted that the additional information in the FEIS Addendum did not change its conclusions presented in the FEIS (FEIS Volume 7, Chapter 4). The Board's concerns regarding potential effects to the marine environment from shipping operations were addressed separately by Sabina in the FEIS Addendum Volumes 9.3 (Accidents and Malfunctions), 10.4 (revised Fuel Management Plan), 10.5 (revised Spill Contingency Plans), and 10.6 (revised Oil Pollution Emergency Plan). For additional discussions related to shipping operations and marine spills see Section 6.2: Accidents and Malfunctions Assessment.

Sabina clarified in the FEIS Addendum that water discharged into Bathurst Inlet would include no additives, would be no more than 10% higher in salt content than the surrounding seawater at the outflow point, and would naturally mix with the receiving environment such that the concentrated saline effluent would not be detectable beyond the outflow point. With salt concentrations expected to be elevated by no more than 10%, Sabina stressed that the effluent would therefore meet the guidelines of the Canadian Council of Ministers of the Environment for the protection of marine life.

During the 2016 Final Hearing, Sabina and Environment and Climate Change Canada (ECCC) agreed on a term and condition or commitment that would require Sabina to design and implement a marine monitoring program to identify potential impacts and information adaptive management. Accordingly, in the FEIS Addendum, Sabina provided Appendix V7-2B: Marine Monitoring Supplemental Information. In this new document, Sabina proposed to monitor intake water, discharge effluent, and the receiving environment in the Marine Laydown Area (MLA) during construction, operations, and closure. Sabina included a new map of the MLA showing 11 sampling locations, which was an increase from the three (3) locations proposed in the FEIS. Sabina also presented corresponding tables indicating planned sample frequencies and parameters to be measured at each location. Sabina stressed that should

monitoring results differ from predictions, adaptive management would be implemented (e.g., storage or treatment of water).

4.13.2 Views and Concerns of Interested Parties

During its presentation at the 2016 Final Hearing, Environment and Climate Change Canada (ECCC) stressed its concern with respect to the coordinating the environmental effects monitoring with the aquatic effects monitoring, as there is a regulatory gap for the marine monitoring aspect and recommended that the proposed monitoring of the area comprising the Marine Laydown Area (MLA) be included as a NIRB project certificate condition, similar to the Mary River Iron Ore Project.[667] Sabina agreed and noted during the 2016 Final Hearing proceedings that a term and condition had been agreed upon by the Kitikmeot Inuit Association (KIA) and ECCC as follows:

> *The Proponent shall design and implement a marine monitoring program at the Marine Laydown Area to identify potential impacts of the project on the marine environment and inform adaptive management actions.*[668] (Exhibit 85, 2016 Final Hearing))

During its closing remarks, ECCC acknowledge its support for the above commitment.[669]

Transport Canada (TC) outlined the regulatory requirements of the *Navigation Protection Act* (NPA) within its 2016 final written submission, and the compliance requirements as relates to the proposed water intake and diffuser to be located at the MLA in Bathurst Inlet, and the anticipated works being required within Bernard Harbour and Bathurst Inlet as part of Sabina's proposed Fish Habitat Compensation Plan.[670] TC noted that Sabina must submit a notice of works directly to TC. Sabina acknowledged these requirements in its response to the 2016 final written submissions and committed to submit the obligatory Notice of Works to TC during the regulatory phase of the Project.[671] During its presentation at the 2016 Final Hearing, TC noted that Sabina has committed to provide the information as requested and that the Department was satisfied with the commitment.[672]

During the 2016 Final Hearing, Board staff requested clarification from Sabina on the factors that were considered for the selection of the proposed MLA.[673] Sabina noted that the selection of the MLA was based on technical considerations which included the depth of the water required to allow ships to come to shore and selection of the location to the proposed winter ice road.[674]

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[667] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 447, lines 4-14.
[668] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 459-460, lines 19-26 and 1-11.
[669] L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1353, lines 22-26.
[670] Transport Canada, 2016 Final Written Submission, March 7, 2016.
[671] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[672] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 534-535, lines 23-26 and 1-13.
[673] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 81, lines 16-20.
[674] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 81-82, lines 23-26 and 1-5.

The Board staff requested clarification from ECCC during the 2016 Final Hearing on the potential for impacts from the proposed desalination plant at the MLA, the effluent that would be discharged, and whether testing would be required at the proposed discharge point.[675] ECCC noted that the effluent from the desalination plant would be within 10% of the salinity of the sea water that is withdrawn from, and the expectation would be that it would be periodically backstopped with an appropriate marine organism toxicity test. However, the testing would not be subject to regulation through a water licence with the Nunavut Water Board (which addresses the freshwater environment only) and the onus would be on the proponent to conduct the testing to verify its predictions.[676]

During the 2016 Final Hearing, a Community Representative from Kugluktuk commented on the shipping routes in the western region and questioned if there was communications with the western region on the proposed shipping routes and whether it would be used by other companies.[677] In response, Sabina indicated that during the review process it had engaged the communities throughout the Kitikmeot region on aspects of its proposed shipping, as well as other parties from the Northwest Territories during the review process. However, Sabina noted that no detailed discussion has occurred with the communities outside the Kitikmeot region.[678]

A Community Representative from Gjoa Haven noted that he had previously undertaken ship-board monitoring and requested clarification on whether monitoring would be conducted for this proposal.[679] Sabina noted that monitoring would be undertaken by onboard observer and would include observation of marine mammals, birds, and other wildlife, Sabina further noted that the information collected would be reported to the NIRB in its annual reports submitted through the monitoring program established for the Project.

A Community Representative from Taloyoak asked Sabina "*…[h]ow many vessels or ships will be hauling between -- going to the site in summertime? How many per summer?*"[680] Sabina noted that it is currently proposing that between three (3) to five (5) vessels per year would enter Bathurst Inlet to reach the proposed MLA. The Community Representative further commented that there appears to be an increase in the number of ships every year that cruise through the arctic waters and requested clarification on the shipping route from Montreal as it appeared from the map presented that it would be travelling between Somerset Island and Prince of Wales. In response, Sabina indicated it would be adding about one percent (1%) to the shipping activity entering Arctic waters every year. Sabina also noted its commitment to notify communities when ships would be transiting the area, should there be any traditional activities be taking place on or near the water, to facilitate safe passage.[681]

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[675] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 460-461, lines 19-25 and 11-15.
[676] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 461, lines 2-8 and 18-23.
[677] M. Tiktalik, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 823, lines 6-15.
[678] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 824, lines 16-25.
[679] B. Putuguq, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 829, lines 8-13 and 24-26.
[680] S. Tulurialik, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1001, lines 23-26.
[681] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1007-1008, lines 8-26 and 1-6.

Within its final written submission on the FEIS Addendum, the Kitikmeot Inuit Association (KIA) expressed concern that sampling locations identified as "near-shore" and "mid-shore" in Appendix V7-2B: Marine Monitoring Supplemental Information may not be representative of those environments as there is only a five (5) metre difference in depth between the two (2) locations. The KIA recommended that Sabina provide a functional definition of near-shore and mid-shore in reference to sampling locations. In its written response to the KIA, Sabina defined near-shore as water approximately four (4) metres deep and likely in the area of greatest influence, and mid-shore as water approximately 13 metres deep and in an area beyond the immediate zone of influence. Sabina noted that sampling locations could be further discussed during the regulatory phase as per a commitment proposed during the 2016 Final Hearing. During the supplemental Final Hearing, the KIA agreed that the placement of monitoring stations could be further refined in the water licensing phase should the project proceed.[682]

Within its final written submission on the FEIS Addendum and during the supplemental Final Hearing, Environment and Climate Change Canada (ECCC) noted that monitoring of the marine environment is outside the scope of both the Metal Mining Effluent Regulations (MMER) and water licensing, and therefore a monitoring program must be in place at an early stage to ensure any project impacts on the marine environment would be detected. ECCC emphasized that the plan should be completed prior to construction and should be stand-alone. ECCC further commented in its submission that Sabina's new proposed marine monitoring program required additional work and recommended that Sabina revise the list of parameters to be sampled and provide more detail on the methodology to be used. In its response to ECCC's final written submission on the FEIS Addendum, Sabina proposed a new term and condition or commitment whereby Sabina would work with INAC, ECCC, and the KIA to develop a stand-alone marine monitoring plan prior to construction. During the supplemental Final Hearing, Sabina responded to ECCC's acknowledgment of this commitment and questions on timing and confirmed that the plan would be completed in advance, allowing extra data to be collected prior to construction.[683] ECCC indicated during its technical presentation that it was satisfied with the response and had no further concerns.[684]

In its final written submission on the FEIS Addendum, ECCC also noted several concerns regarding Sabina's Diesel Fuel Oil Spill Model, the lack of a tactical response plan, and the need for early identification of a third-party responder. During the supplemental Final Hearing there was considerable discussion among parties and Community Representatives centred on shipping safety in the marine environment. For further discussion of these and other emergency response issues, as well as for Sabina's responses, see Section 6.2: Accidents and Malfunctions Assessment.

During the supplemental Final Hearing, a Community Representative from the Burnside Hunters and Trappers Organization (BHTO) asked Sabina what proportion of freshwater per unit of saltwater would be gained through the desalinization process.[685] Sabina clarified that approximately 10% of the input

[682] J. Ottenhof, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 422, lines 11-18.
[683] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 314-315, lines 25-26 and 1-5.
[684] A. Wilson, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 483, lines 12-17.
[685] P. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 807, lines 6-9.

saline water is used to make freshwater and 90% is released back into the marine environment. Sabina further noted that the camp would be very small and would not require a significant amount of water.[686]

Within its final written submission on the FEIS Addendum, Indigenous and Northern Affairs Canada (INAC) indicated that it had reviewed the additional information provided by Sabina relating to saline water discharge into the marine environment, and was satisfied with Sabina's assessment. INAC agreed that a discharge concentration of no more than 10% of natural salinity levels would be protective of the environment and that discharge volumes would also be very small. INAC confirmed that, as was noted during the 2016 Final Hearing, the deposition of material into Arctic waters would be addressed by the department during the permitting phase, and that it would work with ECCC to determine the appropriate water quality parameters to be included in an authorization. In its written response, Sabina reiterated its commitment to working with ECCC on the design and implementation of a marine monitoring program. During the supplemental Final Hearing, INAC reiterated that it had not previously raised any concerns related to saline water discharge into the marine environment, and that it remained satisfied with the Proponent's assessment. INAC emphasized in its technical presentation that regulatory oversight would be provided through the *Arctic Waters Pollution Prevention Act* and the *Territorial Lands Act*, both under INAC's jurisdiction, and the associated regulations would govern the conditions of the marine pipeline installation.[687]

Lastly, during the supplemental Final Hearing, a Community Representative from Taloyoak asked Sabina and Fisheries and Oceans Canada if they knew of sonar or underwater seismic surveys being conducted near Taloyoak[688,689]. Sabina responded that it was unsure[690]. A representative of the Canadian Coast Guard indicated that the Canadian Hydrographic Service has been mapping the sea bottom and continental shelf for marine charts in the north, but was not aware of the specifics.[691]

4.13.3 Views of the Board

As expressed during the 2016 Final Hearing and in the 2016 Final Hearing Report, the Board had several questions and concerns related to adequacy of proposed management and mitigation options to limit adverse impacts to the marine environment due to shipping activities and in the event of a project-related marine oil spill. During the 2016 Final Hearing, the Board asked "*[w]here will [Sabina] be exchanging your ballast water prior to entering either the Coronation Gulf, Dease Strait or into the Bathurst waterways.*" [692] Sabina indicated that ballast water would not be discharged into Arctic waters as ballast water is generally used only when a vessel is empty. In the case of this proposed project,

[686] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 807-808, lines 24-26 and 1-12.
[687] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 523, lines 7-11.
[688] S. Oleekatalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 699, lines 15-21.
[689] S. Oleekatalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 985, lines 13-21.
[690] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 700, lines 18-20.
[691] J. Brickett, Canadian Coast Guard, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 985-986, lines 24-26 and 1-7.
[692] A. Maghagak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 185, lines 5-12.

Sabina noted that the ships would be full when sailing to the MLA site.[693] Views of the Board related to marine shipping safety are discussed in Section 6.2: Accidents and Malfunctions Assessment and Section 4.14.4: Marine Wildlife, however, to summarize, the Board concluded in the 2016 Final Hearing Report that communities throughout the region expressed concern regarding marine shipping and the Board was not assured that Sabina and shipping companies were well-enough prepared and informed by government authorities regarding the sensitive marine environment.

Another significant concern of the Board related to the marine environment was the proposed saline water discharge from the desalination plant at the Marine Laydown Area. During the 2016 Final Hearing, the Board requested clarification from Fisheries and Oceans Canada (DFO) on whether any long term studies have been conducted on the potential impacts to fish from the discharge of effluent from the proposed desalination plant.[694,695] DFO indicated that its mandate would only extend to the footprint of the outfall and its impacts on the habitat and could not provide an answer to the question on impacts of the effluent water on fish.[696] ECCC also responded to the question, noting again that the discharge of the effluent to the marine environment would not be subject to the regulations under the Nunavut Water Board water licence. However, ECCC noted that the assessment work completed by Sabina and the proposed discharge plan were acceptable and it had no concerns with respect to fish related to the proposed discharge activities from the desalination plant.[697] Neither DFO nor ECCC were able to provide a response to the Board's question on studies undertaken on the potential impact to fish from the discharge of saline water into a marine environment, however ECCC did provide the Canadian Council of Ministers for the Environment guideline values for salinity in a marine environment during the 2016 Final Hearing, for the Board's review. During its presentation at the 2016 Final Hearing, Indigenous and Northern Affairs Canada (INAC) advised the Board "*… that the deposition of material into Arctic waters would be addressed through an authorization issued by the department under the same instrument that allows the installation of the outfall*." INAC further indicated that it would work with ECCC to determine the appropriate water quality parameters that would be appropriated into the authorization.[698] In the 2016 Final Hearing Report, the Board concluded it remained concerned regarding the effects of saline water discharge at the Marine Laydown Area.

The Board appreciates clarification of the proposed saline water discharge at the MLA that was provided by Sabina in the FEIS Addendum and at the supplemental Final Hearing. The Board understands the issue falls under the jurisdiction of INAC and is satisfied that the regulatory process together with Sabina's commitment to ECCC to develop a stand-alone marine monitoring plan with enough time to collect additional baseline data will ensure any project impacts on the marine environment would be detected.

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[693] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 185-186, lines 14-26 and 1.

[694] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 495-496, lines 17-26 and 1.

[695] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 498, lines 1-5.

[696] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 496, lines 5-21.

[697] A. Wilson, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 497, lines 5-20.

[698] K. Costello, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 554-555, lines 18-26 and 1-3.

Finally, the Board acknowledges that the proposed water intake and diffuser to be located at the MLA in Bathurst Inlet and the anticipated habitat compensation works within Bernard Harbour (see Section 4.9) and Bathurst Inlet would have to meet requirements under the *Navigation Protection Act*.

4.13.4 Conclusions and Recommendations of the Board

The Board concluded in the 2016 Final Hearing Report that there was considerable uncertainty in relation to the effects predicted for the proposed saline water discharge at the Marine Laydown Area and the adequacy of emergency preparedness and response capacity for shipping of bulk fuel into Bathurst Inlet for the Project. Following a review of the new material presented by Sabina in the FEIS Addendum and the supplemental Final Hearing as well as the updated views of Parties, the Board believes that the Project's potential effects related to the marine environment could be appropriately managed through the commitments provided by the Proponent and application of mitigation measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Maintain a marine monitoring program at the Marine Laydown Area to identify potential impacts of the Project on the marine environment and to inform adaptive management actions.

4.14 MARINE WILDLIFE

4.14.1 Views of the Proponent

Sabina provided its assessment of potential project-induced effects on marine wildlife in Volume 7, Sections 4, 5, and 7 of the FEIS. Sabina identified marine fish and aquatic habitat, marine fish community, and Ringed Seals, respectively, as focus areas for its assessment of potential effects on marine wildlife. Supporting marine baseline information, including marine fish habitat studies and shipping sensitivity details, was provided in Appendices V7-4A, V7-4B, and V7-6A. Sabina's assessment resulted in the predicted occurrence of two (2) residual effects for marine fish and aquatic habitat (construction and use of the lightering barge terminal, and intake and discharge pipes), one (1) residual effect (ship noise) for the marine fish community, including Arctic Char, and no residual or cumulative effects for ringed seals. All potential residual effects were predicted, contingent on the application of proposed mitigation measures, to be not significant. Based on the limited spatial extent of the potential residual effects identified for marine fish and aquatic habitat, Sabina indicated that no cumulative effects would be expected. Sabina indicated that the potential residual effect identified for the marine fish community could act cumulatively with two (2) future projects; however, it was further predicted this effect to be not significant. Based on the limited spatial extent of all potential residual and cumulative effects, no transboundary effects were predicted.

Sabina identified the following two (2) spatial boundaries for its assessment of potential project-induced impacts on the marine environment:

- *Marine Local Study Area* (LSA) — Includes the Marine Laydown Area (MLA) Potential Development Area (PDA); a one (1) kilometre (km) buffer around the MLA PDA; a 15 km section of near-shore marine waters and shoreline immediately south of the MLA PDA; and the proposed winter ice road crossing the connecting inlet, for a total assessment area of 2,100

hectares (ha).

- *Marine Regional Study Area* (RSA) – Includes the marine LSA; marine areas from the southernmost tip of Bathurst inlet up to approximately 15 km north of Omingmaktok; and a 75-km east-west boundary width, for a total assessment area of 299,971 ha.

The temporal boundaries identified in Sabina's marine wildlife assessment aligned with all project phases, including mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

Marine Fish and Aquatic Habitat

For its analysis of potential project-induced impacts on marine fish and aquatic habitat, Sabina noted that its assessment included only the potential direct effects of the Project on physical aspects of the marine environment that provide distinct habitat for commercial, recreational, or Aboriginal (CRA) fisheries species. Sabina noted that its assessment did not include potential indirect effects of project activities on the biological resources utilized by marine fish, including effects to primary and secondary producers. Within its assessment, Sabina identified two (2) potential effects that may occur through the interaction of project components with marine fish and aquatic habitats: serious harm occurring through a loss or reduction of fish habitat by permanent alteration or destruction; and serious harm occurring through changes to water and sediment quality arising from the deposition of deleterious substances. These potential interactions were assessed in relation to project components and activities, including: project infrastructure footprint including the lightering barge terminal; water intake and discharge pipes for the desalination plant; winter ice road construction; and use and effects from shipping activities such as vessel wakes and propeller wash.

Sabina indicated that the proposed seasonal lightering barge terminal at the proposed MLA would have a total footprint of 380 square metres (m^2) and would result in a loss of habitat for benthic marine invertebrates (predominantly Macoma clams), primary production, spawning habitat for Capelin, and foraging habitat for demersal fish species. Sabina stated these losses would occur during the construction and operations phases, and potentially for part of the reclamation and closure phases. Sabina estimated that the temporary loss of aquatic habitat due to the construction of in-water intake and discharge pipes to and from the proposed desalination plant in the MLA would be 9,918 m^2 (0.99 hectares). Sabina predicted that the construction footprint could also result in a loss of habitat available for benthic marine invertebrates (predominantly Macoma clams), primary production, spawning habitat for Capelin, and foraging habitat for demersal fish species. However, Sabina noted that compared to the availability of similar habitat in the LSA and RSA, these temporary habitat losses would likely have a negligible effect on CRA fish production.

Sabina noted that the potential alteration and loss of fish habitat along shorelines could occur from the construction and use of the proposed winter ice road. Sabina noted that if proper vehicle speeds were not maintained during the use of winter ice road, waves formed under the ice surface could dislodge ice near shorelines and therefore potentially increase the possibility of ice scour and the degradation of fish habitat in the area. Sabina also noted the potential for impacts to marine fish and aquatic habitat resulting from construction operations, as well as accidents and malfunctions along the winter ice road (see Section 6.2: Accidents and Malfunctions Assessment).

Sabina indicated that potential effects from vessel wakes and propeller wash on the marine environment could result in the erosion, deposition, and resuspension of sediments into the water

column, therefore causing changes to water and sediment quality. Sabina also indicated that the deposition of deleterious substances from runoff and contact water would also have the potential to impact sediment and water quality, thus impacting marine fish and aquatic habitat.

Within its assessment, Sabina included mitigation and management measures that were considered to be technically, environmentally, and economically feasible to avoid or minimize potential effects of the Project on marine fish and aquatic habitat. Measures proposed to mitigate potential impacts included: optimized design measures to avoid infrastructure development in fish-bearing waters and encroachment on fish habitats; measures to reduce sediment displacement from site and excavated materials; best management practices including vessel, machinery, and vehicle operations protocols; adaptive management protocols based on results from monitoring programs; development, operation, and maintenance of infrastructure following Fisheries and Oceans Canada's (DFO) Measures to Avoid Causing Harm to Fish and Fish Habitat; and other DFO guidance documents for ice bridge construction and winter water withdrawal.

Sabina's assessment resulted in the predicted occurrence of two (2) residual effects for marine fish and aquatic habitat: effects from the in-water footprint of the lightering barge terminal, and effects from the in-water construction footprint of the intake and discharge pipes. For both effects, Sabina noted that the footprints would occur within the most common and abundant habitat along western Bathurst Inlet, and that the footprints would impact 0.00001% and 0.0005% of the LSA, respectively. Sabina predicted that the magnitude of both potential effects would be negligible, of short to medium-term duration, sporadic nature (for seasonal barge deployment), and of immediate reversibility. Sabina predicted that the re-colonization of benthic invertebrates would likely occur immediately following the construction of the pipes and the permanent removal of the barge structure with no intervention. Sabina predicted, contingent on the application of mitigation measures, that all potential residual effects related to marine fish and aquatic habitat, as well as marine sediment and water quality, would be not significant (see Section 4.13: Marine Environment). Sabina stated that no transboundary or cumulative effects would be expected, based on the limited spatial extent of the predicted residual effects.

Marine Fish Community

Sabina indicated that 19 fish species were captured, or presumed to occur, within the marine LSA. Of the 19 species, Sabina selected Arctic Char as the representative species for its assessment, based on its capacity to represent the health, distribution, and population of CRA fish species and the moderate to significant concerns identified. Sabina's selection was developed through consultation with regulatory agencies, communities, and Inuit groups. Within its assessment, Sabina identified two (2) potential effects that may occur through the interaction of project components with Arctic Char: direct mortality and effects to population abundance resulting from in-water construction of the barge terminal and shipping activities; and reduction in water and sediment quality resulting from the management of contact water, discharge, effluent, and dust.

Sabina's assessment of potential indirect effects of project activities on fish health, or potential for contaminant bioaccumulation in Arctic Char, was provided in its assessment of Country Food in Volume 5, Section 4 and 5 (see Country Food within Section 6.1: Human Health and Environmental Risk Assessment).

As previously noted in the above marine fish and aquatic habitat sub-section, Sabina indicated that the proposed seasonal lightering barge terminal would have a total footprint of 380 m^2, and the estimated temporary loss of habitat due to the construction of in-water intake and discharge pipes would be 9,918

m^2. Sabina noted that direct mortality of Arctic Char during the construction and use of the barge and pipes could occur, but would be highly unlikely due to the removal of all fish from the construction site through fish salvage, as well as the ability of adult Arctic Char to easily disperse during the seasonal launching of the barge.

Sabina noted that Arctic Char in the vicinity of the PDA could potentially be impacted by propeller noise from vessels arriving and departing from the MLA. Sabina indicated that potential impacts could include: stress-induced reductions in growth and reproductive output; interference with critical functions such as predator avoidance and prey detection; and the potential for startle responses from high amplitude noises. Sabina illustrated the potential for the introduction of invasive species and environmental contamination from the discharge of ballast water, but noted that the Project would not discharge ballast water and therefore it would not be considered a potential residual effect.

Within its assessment, Sabina included mitigation and management measures that were considered to be technically, environmentally, and economically feasible to avoid or minimize potential effects of the Project on Arctic Char. Sabina proposed similar measures to those proposed for marine fish and aquatic habitat, including: optimized design measures to avoid infrastructure development in fish-bearing waters and encroachment on fish habitats; measures to reduce sediment displacement from site and excavated materials; best management practices including vessel, machinery, and vehicle operations protocols; adaptive management protocols based on results from monitoring programs; and the development, operation, and maintenance of infrastructure following DFO's Measures to Avoid Causing Harm to Fish and Fish Habitat; and other DFO guidance documents for ice bridge construction and winter water withdrawal.

Sabina's assessment resulted in the predicted occurrence of one (1) residual effect for the marine fish community (Arctic Char): effects of ship noise on Arctic Char potentially causing avoidance and physical stress. Sabina indicated that the generation of underwater noise from ships would be unavoidable, but would be mitigated by reducing the speed of vessels travelling within the LSA. Sabina determined that the magnitude of the effect would be low due to the low frequency of ship travel (three (3) to five (5) vessels per year during open-water season) and the ability for Arctic Char to avoid impacted areas during ship passage. Sabina further described the potential effect as being regional (occurring within the RSA), sporadic, reversible, and of medium-term duration. Sabina determined, contingent on the application of mitigation measures, that the predicted effect would be not significant. Sabina predicted that the potential residual effect identified for the marine fish community (Arctic Char) could act cumulatively with two (2) potential future projects: the proposed Bathurst Inlet Port and Road Project (BIPR) and the proposed Hackett River Project. Sabina indicated that if these projects were to proceed, Arctic Char would be exposed to increased noise from shipping within the marine RSA. Sabina indicated that the magnitude of this cumulative effect would be low and that noise increases would be limited to a 100 m ZOI around the ship location. The potential cumulative effect was further described as being sporadic, reversible, with medium-term duration. Sabina predicted, contingent on the application of mitigation measures, including vessel speed restrictions, that the cumulative effect would be not significant. Based on the limited spatial extent of the predicted residual and cumulative effects, Sabina stated that no transboundary would be expected.

<u>Ringed Seals</u>

Sabina identified several marine mammal species known to occur outside of the marine RSA; however, Sabina indicated that only two (2) species of marine mammals occur within the assessment area: the ringed seal and the bearded seal. Sabina selected the ringed seal as the representative species for its

assessment of marine mammals due the ringed seal's more abundant population in the marine RSA. Species scoped out of Sabina's assessment that are known to occur along the proposed commercial Northwest Passage shipping route were noted to include walrus, narwhal, beluga whale, bowhead whale, polar bear, bearded seal, harp seal, and killer whale. Sabina noted that these species would likely not come in contact with vessels on the proposed shipping route, regardless of vessel traffic volume, due to their distribution and preferred habitats.

For its assessment of potential project-induced effects on ringed seals, Sabina identified six (6) potential effects that could occur through their interaction with project components. The potential effects, developed from relevant scientific literature, professional judgement, experience at similar projects in Nunavut and the Northwest Territories, and Traditional Knowledge, included: habitat alteration or degradation; disturbance due to noise; direct mortality and/or injury; indirect mortality; exposure to contaminants; and reduction in reproductive productivity. The potential effects identified were assessed in relation to project components and activities at the MLA (e.g., construction and operation of infrastructure, fuel spills, and water and soil contamination) and shipping within the marine wildlife LSA. Sabina identified the construction and operations phases as the years with the largest potential effects on ringed seals due to the volume of activities anticipated at the MLA. Sabina indicated that these were the only phases considered within its assessment to establish worst-case predictions.

As previously stated, Sabina estimated the footprint of the proposed lightering barge terminal to be 380 m^2. Based on this estimate, Sabina stated that the proposed barge would result in a seasonal (summer) habitat loss of 0.0038 ha for ringed seals, which would be under 0.01% of both the marine LSA and RSA. Winter infrastructure (November to late-June) would be expected to alter seal habitat through the development of the proposed winter ice road and the on-ice aircraft landing strip. Sabina indicated that these winter infrastructure components would represent 281 ha of altered habitat, which would be 13% of the available ice habitat in the marine LSA and under 0.01% of the marine RSA. Sabina did not identify habitat alteration or loss as a potential residual effect due to the range of habitat available within the marine RSA during both seasons, the limited spatial extent of the lost or altered habitats, and the expected low density of ringed seal as indicated by baseline studies.

Sabina calculated potential disturbances due to noise on seals from vessel traffic by calculating the amount of time any individual seal could be in a vessel's zone of influence (ZOI) if it remained stagnant during vessel passage. Using an anticipated vessel speed and an estimated ZOI, Sabina predicted that a motionless seal would be in a vessel's ZOI for a maximum of 1.4 minutes. No potential residual effect for shipping disturbance was identified, based on the low proposed volume of seasonal traffic (10 one (1)-way trips), brief disturbance potential, and the low distribution of seals anticipated in the marine RSA during summer shipping.

Similarly, Sabina conducted noise modelling to predict potential effects from winter ice road traffic and aircraft overflight noise on seals. Based on population densities observed in the region and a potential ZOI on either side of the proposed winter ice road, Sabina estimated that three (3) individual seals could potentially be disturbed from vehicle noise. Using comparable density estimates, aircraft overflights were estimated to potentially affect 592 seals within a 28,874 ha ZOI. Sabina noted, however, that no ringed seal lairs were observed in the southern portion of Bathurst Inlet and therefore impacts to pups and nursing adults would not be expected. Sabina did not identify potential residual effects on seals for winter ice road traffic or aircraft overflight noise, based on the anticipated low distribution of seals in the area, the unlikely occupation of areas underneath the winter ice road, and the sound-dampening effects that would occur if lairs were within aircraft ZOIs. Sabina also indicated, based on studies

conducted at other industrial developments, that it would expect ringed seals in the project area to adapt to project-related noise and visual disturbances resulting from the proposed construction activities at the MLA.

Sabina identified that vessel strikes during the open water season, vehicle strikes on the winter ice road, and aircraft strikes on the marine landing strip and in the open water (float plane landings) could result in the mortality or injury of seals. Sabina noted that aircraft landing and takeoff areas would be monitored for the presence of wildlife and would not continue operations if wildlife was sighted, mitigating any potential impacts from aircraft strikes. Sabina also indicated that it would not expect ringed seals to occupy areas surrounding the winter ice road for winter lairing, and that adult ringed seals would be expected to respond to construction and vehicle noise through avoidance. Sabina further indicated that winter ice road operations would cease in late-April to avoid the ringed seal haul out period for moulting, and that low population densities of seal during summer periods would be expected to limit potential impacts from vessels. Due to the unlikely interaction of ringed seals with project activities during winter months and the low density of ringed seals in the Bathurst Inlet area during the open-water season, Sabina indicated that mortality and injury were not identified as a potential residual effect.

Sabina noted that indirect mortality from increased hunting and predation by natural predators was not identified as a potential residual effect as an increase in human hunting in the RSA would not be expected, and that project activities would not be expected to attract additional predatory species to the area. Sabina also noted that it would not expect exposure to contaminants to remain as a residual effect based on based on its assessment that project-related activities were not expected to alter the quality of sediments, marine water, or marine fish (see Section 4.13: Marine Environment).

Sabina indicated that reproductive productivity was calculated by adding the compounded impact of all predicted residual effects that could result in a decline in reproductive success. Sabina identified that of all the potential effects, ringed seals would likely be most affected by the Project through disturbance from aircrafts, which could potentially result in disturbance behaviours leading to decreased pup attendance in lairs and provisioning of food and warmth, and in most extreme cases, abandonment. Sabina also noted that climate change could impact reproductive productivity through the alteration of sea ice concentrations and seasonal duration, which could have a variety of impacts such as the reduced availability of habitat, changing migration patterns, and nutritional status. Sabina did not identify reproductive productivity as a potential residual effect due to its determination that all project-related effects would have limited spatial extent and that identified effects would not impact parameters such as sea ice and marine productivity.

In its analysis of potential project-induced effects, Sabina considered mitigation, monitoring, and adaptive management measures included in its Wildlife Mitigation and Monitoring Plan (Volume 10, Section 20) designed to reduce or eliminate potential effects on wildlife, including ringed seals. Measures proposed to mitigate potential impacts included: optimized project design measures to site project infrastructure away from sensitive wildlife areas (e.g., birth lairs); specific waste and chemical management protocols; noise abatement and attraction reduction measures; use of open-water shipping; incorporation of best management practices such as avoidance of construction operations around sensitive wildlife temporal periods; aircraft flight restrictions, vehicle operations restrictions; and the incorporation of adaptive management protocols based on results from facility-specific and species-specific monitoring programs. Information pertaining to Sabina's Wildlife Mitigation and Monitoring Plan, as well as other management plans containing wildlife-related mitigation measures, was provided

in Volume 10 of the FEIS.

Sabina determined, contingent on the application of mitigation measures, that no residual, cumulative, or transboundary effects would be expected for ringed seals.

In Volume 7.7 (incorrectly labelled as 7.5) of the FEIS Addendum, Sabina provided additional detail and information regarding marine wildlife, with a focus on ringed seals. Sabina addressed two (2) terms and conditions that were recommended by Fisheries and Oceans Canada (DFO) and agreed to by Sabina during the 2016 Final Hearing related to pre-construction seal lair surveys and marine mammal surveys. Sabina also updated text in the Wildlife Mitigation and Monitoring Program Plan (WMMPP; Volume 10, Chapter 20) in follow up to meetings with the Kitikmeot Inuit Association (KIA) and the Government of Nunavut (GN). Sabina identified that the additional information did not change the conclusions presented in the Marine Environment section of the FEIS (FEIS Volume 7, Chapter 4).

Additional commitments added to the WMMPP related to marine wildlife, included:

- Sabina will conduct pre-construction surveys for seal lairs if on-ice construction is planned during the seal pupping season;
- If a ringed seal is found on land in the Marine Laydown Area infrastructure area, Sabina will contact the KIA prior to any action being carried out;
- Sabina will work with DFO and any other relevant parties to determine the most effective methodology should construction be proposed during the seal pupping period and structures that may support lairs be unavoidable;
- Sabina will produce detailed standard operating procedures (SOP) related to seals. The SOPs will include training requirements for staff, methods for monitoring, and data sheets;
- Sabina will work with DFO and interested parties in the development of a ship based marine mammal monitoring program that utilizes bridge crew; and
- Sabina will produce a simplified SOP for marine mammal surveys and ensure they are conducted following the basic methods provided in the protocol outlined in Recommended Seabird and Marine Mammal Observational Protocols for Atlantic Canada (Moulton & Mactavish 2004).

Sabina also provided an Oil Pollution Emergency Plan (OPEP; Volume 10, Chapter 6), which included measures for the protection of marine wildlife in the event of a potential spill. While portions of the OPEP were revised for the FEIS Addendum, the section on the protection of wildlife was unchanged from the FEIS. For additional information, see Section 6.2: Accidents and Malfunctions Assessment.

4.14.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, Fisheries and Oceans Canada (DFO) indicated the importance of selecting and locating the winter ice road and winter air strip so that it would avoid potential negative impacts on ringed seals and specifically to ring seal birthing lairs.[699] DFO further noted that the proposed shipping activities and on-ice operations at the Marine Laydown Area (MLA), including operation and construction of the winter ice road and aircraft landing strip, would potentially result in a

[699] Fisheries and Oceans Canada, 2016 Final Written Submission, March 7, 2016.

negative impact on marine mammals. DFO requested that Sabina continue to work with DFO, communities, and other interested parties in the development of a ship-based marine mammal monitoring program. In response to the 2016 final written submissions, Sabina noted that it has committed to a pre-construction monitoring plan for seal lairs and would continue to work with interested parties in the development of a ship-based marine mammal monitoring program.[700] During its presentation at the 2016 Final Hearing, DFO noted that these technical issues have been resolved to the satisfaction of the Department based on the responses provide by the Proponent.[701]

During the 2016 Final Hearing, a Community Representative from Cambridge Bay noted concern with potential impacts of the MLA and, in particular, the area where off-loading would occur, to seals and seal pups, noting that during the winter it can be difficult to see the breathing holes.[702] In response to this concern, Sabina noted that it has made a commitment with DFO to establish a proper procedure to ensure infrastructure (ice airstrip and small portion of the winter ice road) do not impact the seal areas.

A Community Representative from Taloyoak requested further clarification on the location of the proposed winter ice road and whether it would be built on the ocean, noting that seal pups are borne sometime between March and early April.[703] Sabina noted that a short portion of the winter ice road option would be located on the sea ice.

A Community Representative from Kugluktuk also provided clarification to parties that seal pups are born during the month of March and noted that care should be taken when driving over the portions of the winter ice road on Bathurst Inlet as the seal pups could be underneath the ice layer.[704] In response, Sabina noted that inspections would be conducted before the development of the winter ice road and during the operation phase of the Project.

Within its final written submission on the FEIS Addendum, Fisheries and Oceans Canada (DFO) acknowledged Sabina's commitment to conduct pre-construction surveys for seal lairs if on-ice construction is planned during pupping season, as well as Sabina's commitment to conduct ship-based marine mammal observations. DFO recommended minor wording changes but agreed with the commitments and indicated it would continue to work with Sabina to develop appropriate mitigation and monitoring plans to mitigate negative impacts to marine mammals. DFO also requested Sabina provide DFO with the data collected during monitoring for marine mammals. In its response to DFO's final written submission on the FEIS Addendum, Sabina confirmed its commitment to the terms and conditions jointly proposed with DFO during the 2016 Final Hearing, and indicated it would update the Wildlife Mitigation and Monitoring Program Plan (WMMPP) to reflect DFO's preferred wording. Sabina also committed to sharing its monitoring data with DFO. During the supplemental Final Hearing, DFO stated that the issue of potential for negative impacts to marine mammals from shipping activities had therefore been resolved to its satisfaction.[705]

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[700] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[701] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 481-483.
[702] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 813, lines 11-16.
[703] S. Tulurialik, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1267, lines 4-11.
[704] M. Tiktalik, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 823-824, lines 21-26 and 1-2.
[705] M. D'Aguiar, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 505-506, lines 12-26 and 1-12.

Within its final written submission on the FEIS Addendum, Environment and Climate Change Canada (ECCC) did not comment specifically on marine wildlife, however, the department recommended that the WMMPP be revised to include a section and table that clearly identifies species at risk and outlines how requirements under section 79 of the *Species at Risk Act* (SARA) are being met for all species at risk. For a detailed summary of ECCC's recommendations and Sabina's responses regarding birds, please see Section 4.12: Birds and Bird Habitat.

In its final written submission on the FEIS Addendum, the Burnside Hunters and Trappers Organization (BHTO), writing also on behalf of the Omingmaktok Hunters & Trappers (OHTO), noted that the proposed shipping route through Bathurst Inlet to the proposed Marine Laydown Area is difficult to navigate and there would be a real possibility for a marine oil spill. The BHTO recommended that Sabina consider marine traffic levels and the potential for spills cumulatively due to the presence of other current and proposed mines in the area. The BHTO went on to express concern regarding potential adverse impacts to marine wildlife in the area. During the supplemental Final Hearing, Sabina reviewed proposed measures to minimize the potential risk of ship related accidents or spills in Bathurst Inlet and the various management and monitoring plans in place[706] (for additional information see Section 6.2: Accidents and Malfunctions Assessment). Sabina also noted that considerable amounts of scientific and Traditional Knowledge had been collected on various topics including the marine environment, and reiterated that robust management plans had been developed for the management of terrestrial and marine wildlife, water, and shipping-related concerns.

During the supplemental Final Hearing, a Community Representative from Kingaok (Bathurst Inlet) commented on a four (4)-year baseline study on marine mammals and asked Sabina whether or not there would be a follow-up study post-closure.[707] Sabina responded in the affirmative, indicating that the monitoring would likely continue for two (2) to five (5) years after the end of the mine, following the same monitoring program committed to for the construction and operations phases.[708]

During the supplemental Final Hearing, a Community Representative from the Cambridge Bay Hunters and Trappers Organization asked about monitoring in general and how long it would take for communities to know whether there had been any kind of effects on animals or the land. Sabina noted in response that any major incidents or accidents would be reported to the various authorities immediately, with communities being notified within hours. In terms of potential effects to water, fish, and air quality, Sabina also indicated that they have detailed, long-term monitoring programs, and that monitoring results would be presented in annual reports. Sabina noted that any significant issues in these areas would also be reported to the appropriate authorities.[709]

[706] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 95, lines 2-20.
[707] C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 787, lines 19-23.
[708] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 788-789, lines 23-26 and 1-9.
[709] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 877-879, lines 23-26, 1-26 and 1-22.

4.14.3 Views of the Board

During the 2016 Final Hearing, the Board requested clarification from Sabina on how many vessels would be expected at the MLA, how many would be carrying fuel, and whether the proposed shipping routes through the east and west of the Northwest Passage were predicted to have significant impacts on marine mammals.[710,711] Sabina noted that a maximum of five (5) ships per year would dock at the MLA during the open-water season. With respect to potential impacts to marine mammals from the ships travelling through the east and west shipping corridors, Sabina projected that the Project would not have a significant impact to marine mammals as there are approximately 350 ships travelling through waters of the Canadian Arctic every shipping season.[712]

During the 2016 Final Hearing, the Board requested information from Fisheries and Oceans Canada (DFO) on the density of ringed seals in the Bathurst Inlet area and around the proposed winter ice road near the Marine Laydown Area (MLA), the density of the ringed seals when the ice melts, and the timing of when the seals are in the area.[713] DFO indicated that based on Sabina's baseline aerial surveys and direct observations, the uncorrected ring seal density was calculated to range from 0.5 to 1.2 seals per square kilometre (km^2), which appeared to be consistent with studies conducted in other areas of the Arctic. However, DFO noted as well that the estimate would be higher and closer to four (4) seals per km^2 if the corrected density calculation was used. DFO indicated that the baseline data was further used to note that the ring seal density was lower in the southern portion of the inlet south of Kingaok (Bathurst Inlet) and higher in the northern section of the inlet. It was further noted that one (1) seal was observed in the MLA and five (5) seals observed south of the MLA during the studies conducted by Sabina. Finally, DFO noted that the abundance and distribution of ringed seals in Bathurst Inlet during the open water season was not well understood.[714]

In the 2016 Final Hearing Report, the Board noted multiple concerns were heard from parties and Community Representatives regarding the potential negative impacts that shipping and construction of a winter airstrip and ice road might have on marine wildlife, especially ringed seals and ring seal birthing lairs. However, DFO clarified that seals tend to be present in greater numbers where there are cracks and pressure ridges in the ice[715]; Sabina would construct the winter ice road to avoid such obstacles when possible.

Following DFO's presentation to the Community Representatives at the 2016 Final Hearing, the Board also asked the Department whether any studies have been conducted on the effect of noise levels of

[710] H. Ohokannoak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 180-181, lines 26 and 1-6.
[711] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 186, lines 7-8.
[712] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 181-182, lines 10-26 and 1-7.
[713] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 501, lines 12-18.
[714] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 528-530.
[715] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 530, lines 1-6.

traffic (truck and aircraft) on the winter ice road on marine mammals and fish.[716] In response, DFO indicated that its recommendation to Sabina was to conduct a monitoring program prior to the construction of the winter ice road to ensure the road would not pass over any ringed seal lairs and areas where the seals would have pups. With respect to potential impacts to fish, DFO noted its experience was from literature and only covered freshwater lake fish. DFO further noted that while some types of fish have sensitive hearing, such as suckers and minnows, overall it is believed that truck traffic does not have a negative impact to fish under the ice.[717] In response to a Board request for further information on how fish are studied to ensure there are no effects from truck traffic on winter ice, DFO noted that three (3) studies have been completed in the North under ice conditions using hydrophones to measure the decibels of the truck noise followed by avoidance behaviours of the fish, and the studies indicated that most of the fish were not affected by the noise (or vibration). DFO also noted that most northern fish species do not have a specialized organ that is sensitive to noise.[718]

In response to the Board's question on the length of time the proposed winter ice road would be active, Sabina indicated that the road would likely run into late April with the airstrip running into early May.[719] Sabina confirmed during the supplemental Final Hearing that the winter ice road would likely be constructed beginning in mid to late December, and shut down by April 15th.[720]

4.14.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to marine wildlife could be appropriately managed through the commitments provided by the Proponent and application of mitigation measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Undertake an annual survey for seals and seal lairs and consider alignment of these components to ensure that seal dens/lairs are not impacted by Project infrastructure or activities;
- Ensure that shipping companies contracted for the Project have in place appropriate ship-based marine mammal monitoring programs and protocols developed through consultation with regulatory authorities and communities to utilize trained observers; and
- Ensure that contracted shipping companies avoid sensitive wildlife habitat and species and utilize appropriate protocols and equipment required to reduce the potential for an accidental release of fuel or other deleterious substances into the marine environment. These protocols should also be communicated to local communities.

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[716] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1179, lines 20-23.
[717] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1180-1181, lines 1-26 and 1-10.
[718] M. D'Aguiar, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1182-1183, lines 17-26 and 1-14.
[719] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1181-1182, lines 25-26 and 1-5.
[720] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 656, lines 20-25.

5 SOCIO-ECONOMIC EFFECTS

Sabina Gold & Silver Corp. (Sabina or the Proponent) described its overall approach for analyzing potential project-induced effects on the human environment in Volume 9, Section 1 and Volume 8, Sections 1-5 of the FEIS. Sabina noted that its development of the FEIS and assessment of potential impacts to the human environment were designed to meet the requirements as outlined within the *Nunavut Agreement* and the NIRB's EIS Guidelines. Sabina undertook the following steps in assessing potential project-induced impacts to the human environment during the engineering, mobilization and construction, operations, reclamation and closure, and post-closure monitoring phases:

- Established the project scope, which encompassed selecting valued socio-economic components (VSECs) and defining spatial and temporal boundaries;
- Identified potential project interactions with each VSEC;
- Characterized potential effects;
- Identified mitigation and management measures to eliminate or reduce potential effects;
- Characterized potential residual effects; and
- Determined the significance of predicted residual effects.[721]

Sabina focused its assessment of potential project-induced effects on the human environment on selected valued socio-economic components (VSECs) and subjects of note. Sabina noted that its selection of VSECs was informed by input from both Proponent and NIRB-led consultation with potentially affected communities, communication with regulatory agencies, and consideration of regulatory requirements and Traditional Knowledge. Traditional Knowledge was collected directly through consultation with community members and indirectly through consideration of written material, including academic literature and a project-specific Traditional Knowledge report published by the Kitikmeot Inuit Association.[722] Sabina explained that the VSECs were selected to represent the interests of residents of the Kitikmeot region. Using information provided by these sources, Sabina identified the following VSECs for its impact assessment:

- Archaeological sites
- Non-traditional land and resource use
- Subsistence economy and land use
- Country foods
- Economic development
- Business opportunities
- Employment
- Education and training

[721] For the purpose of this report, effect and impact will be used synonymously.

[722] Kitikmeot Inuit Association. (2012). Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP). Prepared for Sabina Gold & Silver Corp. by Kitikmeot Inuit Association: Kugluktuk, NU.

- Health and community wellbeing[723]

Sabina also considered the following as subjects of note:

- Paleontological sites
- Human health and risk assessment
- Environmental risk assessment

Sabina assessed potential project-induced effects on each VSEC within a Local Study Area (LSA) and a Regional Study Area (RSA). Individual LSAs and RSAs were defined for: archaeology, socio-economics, land use, and country foods (see respective sections for specific extents). The temporal boundaries for each VSEC were defined in association to planned activities over the lifetime of the Project and were defined by project phase (see Section 2.2.3: Project Phases). Community level data was provided for Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, and Kugaaruk and Nunavut-wide information was utilized when available. Due to the lack of municipal services and year-round occupancy in Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo), Sabina focused its social and economic effects assessment on the five (5) Kitikmeot communities occupied year round (Kugluktuk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugaaruk).

Sabina used information collected from Statistics Canada, the Nunavut Bureau of Statistics, the Government of Nunavut, and other sources to develop baseline values of each VSEC to be used as a reference point when predicting potential project-induced effects. Sabina characterized, or described, potential effects from the project on VSECs through quantitative (e.g., predictive economic modelling), semi-quantitative (e.g., measured site-specific data and existing site information) and qualitative (e.g., expert opinion, Traditional Knowledge, and literature review) techniques.

Sabina used the following mitigation and management approaches to avoid, reduce, control, eliminate, offset, or compensate potential effects on the selected VSECs:

- Optimize alternatives by changing a project component to prevent or reduce potential adverse effects;
- Implement changes in design to prevent or reduce potential adverse effects;
- Use proven and economically achievable technological applications;
- Utilize best management practices;
- Incorporate follow-up monitoring and adaptive management;
- Provide compensation to offset remaining effects that cannot be prevented or reduced through remedial or compensatory actions; and
- Provide measures to enhance a beneficial effect, particularly as relates to potential socio-economic effects.

Any potential project-induced effects that Sabina determined would not be eliminated by the proposed mitigation measures were categorized as potential direct, indirect, or cumulative residual effects. Predicted residual effects were further characterized and analyzed to determine the potential for

[723] Sabina categorized the latter five (5) VSECs under the over-arching heading of socio-economics.

significant adverse effects. Sabina applied the following attributes to evaluate the potential significance of predicted residual effects:[724]

- Significance criteria
  - Direction of potential effect(s) (positive, neutral, variable, negative);
  - Magnitude (low, moderate, high); and
  - Duration (short, medium, long).
- Likelihood of Occurrence
  - Frequency (infrequent, intermittent, continuous);
  - Geographic extent (local study communities, regional study communities, description of area and communities most affected);
  - Reversibility (reversible, partly reversible with cost/effort, irreversible); and
  - Equity (distribution of effect across different social groups: equitable, neutral, inequitable).[725]
- Overall Significance Rating
  - Probability (unlikely, moderate, likely);
  - Confidence (low, medium, high); and
  - Significant/not significant.

Sabina noted that the overall significance ratings were derived from ranking contributing attributes, and that although the determination of significance was largely based on professional judgement, general criterion was applied. In additional to the criterion established to determine the significance of potential residual effects on VECs (see Section 4.0: Ecosystemic Effects), Sabina further outlined that if it expected negative socio-economic effects to be limited to individuals who were also expected to see positive impacts, the predicted effects were considered likely to be "not significant".

Sabina conducted a potential cumulative effects assessment for each VSEC that it identified as having a potential negative project-induced residual effect. The geographic boundary of the cumulative effects assessment encompassed projects and human activities in the Kitikmeot region and the Northwest Territories that were considered to have potential effects within the socio-economic RSA relevant to residents. In characterizing potential cumulative residual effects on VSECs, Sabina generally assumed that the other resource development projects included in the assessment would adopt similar mitigation and management measures to those proposed for the Back River Project. Sabina further noted that due to the amount of information available, greater reliance was placed on professional judgement and Traditional Knowledge when assessing the potential for cumulative effects. Sabina considered the following scenarios in its cumulative effects assessment:

- Past projects and activities: Jericho Diamond Mine and Lupin Gold Mine;
- Existing projects and activities: Doris North Gold Mine, Ekati Diamond Mine (NWT), Diavik

[724] These are the general attributes assigned by Sabina to assess the potential effects of every VSEC included in the assessment. The application of the attributes and definitions specific to archaeological sites, socio-economics, land use, and country foods are discussed further in the sections of this report focused on those specifics VSECs.

[725] Used to assess the socio-economic VSECs (economic development, business opportunities, employment, education and training, and health and community wellbeing).

Diamond Mine (NWT), and Snap Lake Diamond Mine (NWT); and

- Foreseeable future projects and activities: George Gold and Silver Mine Project; Bathurst Inlet Port and Road Project, Hackett River Base Metals Mine Project, Phase 2 Hope Bay Belt Gold Mine Project, Izok Corridor Base Metal Mine Project, and the Canadian High Arctic Research Station.

Sabina further assessed the potential for project-induced transboundary effects in the Northwest Territories related to employment, health and community wellbeing, and land use.

Sabina's proposed Socio-economic Program (SEMP), developed to align with the current efforts of the Kitikmeot Region Socio-economic Monitoring Committee, was outlined within the Socio-economic Plan, presented in Volume 10, Part 24. The SEMP was outlined as being developed to align with the efforts of the Kitikmeot Region Socio-economic Monitoring Committee. Through collaboration with the Government of Nunavut, Indigenous and Northern Affairs Canada, and the Kitikmeot Inuit Association Sabina developed draft terms of reference for the project-specific Socio-economic Monitoring Program which would be comprised of representatives of the respective organizations and departments. It was noted that the SEMP was informed by community-based research and lessons learned from proximally located mine projects. Sabina stated that the SEMP was developed to comply with the *Nunavut Agreement* and would be used to ensure that the Project fulfills best practices in social responsibility relating to community engagement, capacity building, and realizing benefits, especially for Inuit. The three (3) overarching objectives of the SEMP were noted to:

- Verify the accuracy of predictions made within the FEIS regarding predicted project-induced effects to the socio-economic environment;
- Utilize monitoring results to inform mitigation measures; and
- Help ensure that the monitoring program design and methodologies are culturally appropriate and relevant to the issues and concerns of local Inuit.

In Volume 3, Section 1, as well as throughout individual volumes of the FEIS, Sabina detailed its use of public consultation and incorporation of Traditional Knowledge during the development of the FEIS, including scoping, assessment of potential effects, and development of mitigation and monitoring measures. Sabina noted that public consultation and engagement was not only a legal requirement and industry best practice, but an important corporate component. Sabina noted that at the time of the FEIS, its public consultation and engagement program was focused on the exploration, environmental assessment, and permitting phases of the Project. In the FEIS, Sabina stated that "a key goal of [its] public consultation and engagement program has been to ensure the company obtains a 'social licence to operate,' by securing the support of a majority of residents from potentially impacted local communities."[726] To do so, Sabina noted that it undertook the following general process:

- Identified and prioritized communities and community stakeholder groups;
- Developed an understanding of key community and stakeholder views regarding the project;
- Addressed community and stakeholder issues and expectations; and
- Expected to continually consult throughout the lifecycle of the project.

[726] FEIS, Volume 3, Section 1, p. 1-1.

Sabina conducted public consultation in the Kitikmeot region, Iqaluit, and the Northwest Territories. Sabina classified communities by the following categories:

- Category 1: Cambridge Bay, Kugluktuk, Kingaok (Bathurst Inlet), and Omingmaktok (Bay Chimo);
- Category 2: Gjoa Haven, Taloyoak, and Kugaaruk; and
- Category 3: Yellowknife (Northwest Territories), and Iqaluit.

Sabina discussed more frequent and extensive engagement opportunities with category 1 communities as they were located in closest proximity to the project footprint and predicted to be most strongly influenced by the Project. Category 2 communities were considered to have fewer socio-economic and cultural ties to the project area than those previously discussed, and it was noted that while Sabina conducted regular engagement activities, it was to a lesser extent. Sabina identified a variety of public consultation and engagement methods used, including meetings, interviews, site visits, use of social media, newsletters, radio shows, and community donations. Stakeholder groups consulted included the local hunters and trappers organizations, hamlet councils and staff, representatives of the Kitikmeot Inuit Association, and, when appropriate, health and social services personnel, local businesses, and local education representatives. Sabina indicated that it undertook specific consultation programs with Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) community members in Cambridge Bay and Kugluktuk. Sabina considered category 3 communities to have limited, albeit existing, socio-cultural and ecosystemic ties to the project, including economic and/or institutional linkages, as potential points of hire. Sabina noted that it had engaged various Northwest Territories Aboriginal organizations, including the Akaitcho Dene First Nations, the Tłı̨chǫ Government, and the North Slave Métis Alliance, through informational meetings with representatives of the respective organizations, one (1) public meeting held in Yellowknife, and through written correspondence.

Sabina committed to incorporate and follow principles of respect, honesty, inclusion, transparency, and communication during consultations. Sabina further noted that it employed different levels of engagement, including transactional, transitional, and transformational, the latter which includes joint project management and decision-making. The Proponent further committed to maintaining communication with local communities and noted that its Community Involvement Plan would be adapted as necessary to ensure it remains relevant and effective.

On February 16, 2017 Sabina submitted a Final Environmental Impact Statement Addendum (FEIS Addendum) to the NIRB to support the Board's further Review of the Back River Project. The FEIS Addendum contained new or updated information to address deficiencies identified by the Minister within the Board's 2016 Final Hearing Report in relation to five (main) ecosystemic issues including caribou and terrestrial wildlife, freshwater aquatic environment, marine environment, water quality (ground and surface), and climate and meteorology, as well as other relevant topics. Sabina structured its FEIS Addendum in 10 volumes which corresponded to its original FEIS document, and remained consistent with the NIRB's EIS Guidelines. Volumes 1 to 9 included additional content as well as select supplemental appendices pertaining to impact assessment studies and supporting documents, and Volume 10 contained new or revised management plans. Within the FEIS Addendum Sabina noted that the new or updated information was intended to generate a higher degree of confidence in the proposal and generally did not affect FEIS sections, such as effect assessments, transboundary effects, and cumulative effects.[727]

[727] FEIS Addendum, Volume 1, p. iv.

The following volumes were included within the FEIS Addendum to supplement specific sections of the FEIS with new and/or updated information:

- Volume 1 Addenda: Main Volume
- Volume 2 Addenda: Project Description and Alternatives
- Volume 3 Addenda: Public Consultation, Government Engagement, and Traditional Knowledge
    - 3.3 Traditional Activity and Knowledge
- Volume 4 Addenda: Atmospheric Environment
    - 4.3 Climate and Meteorology
- Volume 5 Addenda: Terrestrial Environment
    - 5.3 Landforms and Soils
    - 5.4 Vegetation and Special Landscape Features
    - 5.5 Caribou, Potential Cumulative Effects Assessment, and Transboundary Effects
- Volume 6 Addenda: Freshwater Environment
    - 6.1 Surface Hydrology
    - 6.4 Freshwater Water Quality
    - 6.6 Freshwater Fish/Aquatic Habitat
- Volume 7 Addenda: Marine Environment
    - 7.4 Marine Fish/Aquatic Habitat (*7.2 Marine Water Quality*)[728]
    - 7.5 Marine Fish Community (*7.7 Ringed Seals*)[729]
- Volume 8 Addenda: Human Environment
    - 8.3 Socio-economics
    - 8.6 Human Health and Environmental Risk Assessment
- Volume 9 Addenda: Methodology, Effects of Environment on Project, Accidents and Malfunctions
    - 9.3 Accidents and Malfunctions
- Volume 10 Addenda: Management Plans
    - 10.4 Fuel Management Plan
    - 10.5 Spill Contingency Plans
    - 10.6 Oil Pollution Emergency Plan
    - 10.19 Aquatic Effects Management Plan
    - 10.20 Wildlife Mitigation and Monitoring Program Plan

[728] Through subsequent correspondence with the NIRB, Sabina confirmed that Section 7.4 Marine Fish/Aquatic Habitat should have been labelled Section 7.2 Marine Water Quality.

[729] Through subsequent correspondence with the NIRB, Sabina confirmed that Section 7.5 Marine Fish Community should have been labelled Section 7.7 Ringed Seals.

- 10.21 Conceptual Fish Offsetting Plan
- 10.30 Vegetation Monitoring Plan
- 10.31 Conceptual Fish-out Plan

Sections 5.1 through 5.11 of this revised Final Hearing Report detail information provided as part of the FEIS Addendum or during the supplemental Review phase specific to the Proponent's consideration for the Project's socio-economic effects. Submissions provided to the NIRB by the Proponent and parties following the release of the 2016 Final Hearing Report, as well as comments and responses received by the NIRB from parties and Sabina during the supplemental Review phase, and discussions and information presented during the supplemental Final Hearing were given careful consideration and are referenced within each section as deemed appropriate. The Board's updated views and recommendations are also provided specific to each topic of the socio-economic effects, with the project-specific recommendations summarized later in Section 8: Recommended Project-Specific Terms and Conditions of this Report.

During the supplemental Final Hearing, Sabina provided an update regarding the development of a prospective Inuit Impact and Benefit Agreement (IIBA) with the Kitikmeot Inuit Association (KIA). Sabina indicated in its update that negotiations with the KIA had progressed and that discussions and negotiations to-date had covered aspects including the following:

- Land tenure;
- Surface rights and obligations, including compensation;
- Water and wildlife obligations, including compensation;
- Inuit employment objectives, including training, health and safety, and cultural commitments;
- Inuit community and cultural objectives and contributions;
- Inuit business and contracting objectives and obligations; and
- Inuit environmental monitoring objectives and commitments.

Sabina noted that it remains committed to continuing its work with the KIA to finalize a mutually beneficial agreement which defines Sabina's social, economic, and environmental commitments for the people of the Kitikmeot region.[730]

5.1 Economic Development and Opportunities

5.1.1 Views of the Proponent

Sabina used an economic impact model, DYNATEC, and results from its 2015 feasibility study to estimate potential direct, indirect, and induced effects of the Back River Gold Mine Project (the Project) on the local, regional, territorial, and national economies.[731] Results were presented in Volume 8, Section 3 of

[730] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 68-69, lines 7-26 and 1-9.

[731] Sabina noted that although its feasibility study included the George Property and indicated that results were not corrected to account for this, the exclusion of the component from the Back River Project was not expected to materially alter predicted economic impacts.

the Final Environmental Impact Statement (FEIS) and additional details and model results were provided in Appendix V8-3B: Back River Project – 2015 Economic Impact Model Report. Additional socio-economic baseline data was made available in Appendix V8-3A: Back River Project – 2012 Socio-Economic and Land Use Baseline Report. Within Volume 8, Section 3.5.5 of the FEIS, Sabina concluded that the Back River Project would result in positive residual effects to regional, territorial, and national economic development through changes to economic growth, diversity, and performance. Sabina concluded that "the Project has the potential to reshape the economy of the Kitikmeot, as one that is increasingly experienced and diverse, and able to support various types of development".[732]

The following two (2) spatial assessment boundaries were considered by Sabina for its effects assessment on economic development and opportunities:

- *Local Study Area (LSA)* – The west Kitikmeot region, including the communities of Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, and Kugluktuk.
- *Regional Study Area (RSA)* – The west Kitikmeot region and the east Kitikmeot region, specifically the communities of Gjoa Haven, Taloyoak, and Kugaaruk, as well as the city of Yellowknife, Northwest Territories.

Sabina's DYNATEC model was derived from the mobilization, construction, and operation expenditure estimates from its feasibility study developed using a Statistics Canada model of national, provincial, and territorial economies. Sabina used the 2010 dataset from Statistics Canada's Input-Output Model as well as 2010 – 2014 data collected from various sources. While the model produced statistical information of many related variables, including employment, personal income, gross domestic product (GDP), and government tax revenues, Sabina emphasized that the model could not take into account potential variability of the economy over time or the effect of proposed mitigation measures. Sabina further clarified that the DYNATEC model was only able to estimate the direct government tax revenues associated with income tax paid by workers and could not be used to estimate corporate profit tax or directly paid royalties, which were calculated using results from the feasibility study. Based on the identified limitations of the modelling framework used in the impact analysis, Sabina concluded that actual project-induced effects could be greater than predicted with the application of proposed mitigation and benefit enhancement measures.

Predictions made by Sabina indicated project-induced impacts to economic growth, diversity, and performance would predominantly be through employment, income, GDP, and government tax revenue benefits. Benefits were predicted to occur mainly during the mobilization and construction and operations phases, with lesser impacts occurring during the reclamation and closure and post-closure monitoring phases. While not expecting that the Back River Project would have an effect on the cost of goods in the communities due to the fly-in/fly-out nature of the Project, Sabina further stated that it did not undertake an independent assessment of potential project effects on the import/export and trade balance of goods, household consumption, or own source tax revenues as its assessment of other variables, including changes to economic diversity, captured potential changes to these economic measures.

<u>Growth</u>

Gross Domestic Product (GDP)

Sabina predicted that positive impacts on economic growth during construction would be expressed

[732] FEIS, Volume 8, Section 3, p. 3-98.

primarily through changes to employment, personal income, GDP, and government tax revenues. Total capital expenditures from the Back River Project were estimated to be $694.7 million during the mobilization and construction phase and $440.04 million during operations. GDP contribution predictions made by the Proponent were based on direct, indirect, and induced expenditures and employment, while tax revenues were derived from personal income tax, corporate profit tax, and sales tax. Using model estimates, Sabina predicted that the Back River Project would result in total GDP contributions during mobilization and construction of approximately $33.2 million to the Kitikmeot region, $43.6 million to Nunavut as a whole, and $502 million to all of Canada. It was further estimated that total GDP impacts in Nunavut would represent approximately two percent (2%) of Nunavut's 2012 GDP. While predicting that the Kitikmeot region would likely capture the majority of direct project contributions to GDP during the mobilization and construction phase, Sabina further predicted that the Kivalliq region would experience the highest indirect GDP contributions due to the current strength of the mining service and construction sectors.

Total operating expenditures from the Back River Project were estimated to be approximately $1,905.60 million. Using the model-generated data, Sabina estimated that the total GDP impact of the Project during the operations phase would be approximately $2,557.5 million to all of Canada, including $382.2 million to Nunavut and $263 million to the Kitikmeot region. Sabina estimated that the project GDP contributions would represent approximately 0.14% of the 2012 Canadian GDP and 17.4% of the Nunavut GDP. It was clarified that the expected direct GDP contributions to the Kitikmeot region of $191.7 million would represent 72.9% of all direct project contributions to GDP in Nunavut. Sabina predicted that the Baffin region would capture the highest portion of indirect project GDP contributions during operations in Nunavut.

Sabina predicted that as a result of expected lag times between potential indirect and induced effects of direct project expenditures, GDP contributions from mobilization and construction would take effect during the first year of mobilization through to 2025, and expected GDP effects from the operations phase would extend beyond the phase, through to 2036.

Tax revenue

Sabina estimated that during the mobilization and construction phase, the Project would generate federal, territorial, and provincial total tax revenues of approximately $5.6 million to the Kitikmeot region, $7.7 million to Nunavut, and $94.5 million to Canada as a whole. Sabina estimated that during operations, the Project would generate federal, territorial, and provincial total tax revenues of approximately $408.8 million to Canada as a whole, including $23.1 million in tax contributions to the Kitikmeot region, and $45 million to Nunavut. Predicted tax revenues in the Kitikmeot region during operations would account for approximately 51.3% of revenues generated within Nunavut, with contributions of approximately $9.9 million to the federal government and $13.1 million to the Government of Nunavut. Sabina noted that project-generated tax revenues could result in changes to public spending and increased federal and territorial government funding and/or resource allocation to community investment and development initiatives (e.g., mine related education and training initiatives or municipal infrastructure). Using results from its original feasibility study, Sabina estimated that the Project would generate approximately $133.5 million in royalty payments over the life of the mine and $240,617.81 million in corporate tax revenue.

<u>Diversity</u>

Sabina predicted that the Back River Project would result in economic diversity as a result of project-related employment, contracting, and business opportunities to the local workforce and businesses.

Economic diversity was characterized as: increased local employment, incomes, and spending; project-related expenditures with existing businesses located in the Kitikmeot region and across Nunavut; new or expanding businesses to provide previously unavailable goods or services; and/or the development of, or additional investment in, Inuit-owned businesses. Sabina further projected that project-induced economic diversity, particularly during mobilization and construction, could result not only from an increase in the number of available jobs in the Kitikmeot region, but from an increased variety of job types.

Performance

Sabina defined economic performance as the success of a market to produce benefits for society through innovative and efficient use of available resources. Sabina predicted that the Project would result in increased economic performance during project mobilization and construction from new local and regional business and employment opportunities, which would lead to notable increases to economic capacity and performance within both the LSA and RSA during operations. Sabina indicated that there could be an association between economic diversity and performance and noted that changes to economic performance could support the expansion and diversity of local economies.

During a temporary closure or during care and maintenance, it was noted that operational activities would be discontinued and many of the direct effects to economic development, such as GDP contributions and government tax revenues, would decrease. Sabina projected that indirect and induced benefits would not immediately stall, as earlier direct expenditures and income would be expected to continue to circulate through the economy for 'some time'. Sabina noted that with the end of most contracts and employment with the Back River Project during the reclamation and closure and post-closure phases, project-related economic activities and growth within the Kitikmeot region would likely slow down. Sabina predicted that "the increase in capabilities and capacity, as well as experience gained by both individuals and companies as a result of their involvement with the Project, would be retained, positioning the Region for further economic growth in the future".[733] Sabina qualified this by noting that the overall condition, including flexibility and adaptability, of the economy and presence of other employment and business opportunities during reclamation would influence the nature of any effects.

Sabina proposed adaptive management practices and monitoring initiatives to enhance potential economic development, detailed in the Business Development and Human Resources plans in the FEIS, Volume 10, Part 24 and 28, respectively. Using industry best practices and community and stakeholder feedback, Sabina identified specific practices to support economic growth and diversity, including support for local Inuit and northern businesses, capacity building, community investment, and facilitating local access to employment and business opportunities.

No new information specific to the Economic Development and Opportunities Valued Socio-economic Component was provided in the FEIS Addendum. For discussion on related information, see sections 5.2: Employment and 5.4: Contracting and Business Opportunities.

5.1.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, the Government of Nunavut (GN) commented on Sabina's economic modelling and noted that any changes to the size or schedule of the Project would affect the

[733] FEIS, Volume 8, Section 3, p. 3-60.

estimated economic impacts.[734] The GN recommended that Sabina: submit an updated feasibility study, including any changes to tax revenue estimates, prior to development; collaborate with the GN regarding the preparation of tax data for fiscal outlooks and tax forecasts; and develop a communication protocol with the GN with regards to the transmission of tax-related information. Within its response to the 2016 final written submissions, Sabina committed to providing a refined feasibility study to the GN prior to development and to communicate information applicable to project-related tax estimates. Sabina requested that the provision of tax-related information reflect appropriate government-industry communication practices with regards to corporate financial information. During its presentation at the 2016 Final Hearing, the GN clarified that while it expects to receive modest tax revenues over the life of the project, if approved:

> *… the government does not receive royalties from mining projects. As the territory's major service provider, it is essential that we are afforded all reasonable opportunity to make informed budgetary decisions. We request that the proponent communicate regularly with finance officials to exchange pertinent and nonconfidential financial information. The proponent is agreeable to this commitment.*[735]

Sabina and the GN agreed on the following proposed commitment with regards to the communication of project-related information that could be used for tax estimates and submitted an updated joint submission on commitments during the 2016 Final Hearing:

> The Proponent will communicate to the Government of Nunavut (GN) available information on major changes to Project-related tax estimates on an as-needed basis. This communication will not preclude either party from contacting the other as necessary for other relevant information.[736]

During the GN's presentations and questioning of the Proponent at the 2016 Final Hearing, the GN did not question or challenge the accuracy or validity of the refined economic feasibility study.

Within their 2016 final written submissions, both the GN[737] and Indigenous and Northern Affairs Canada[738] (INAC) commented on Sabina's commitment to regional and project-specific monitoring and noted that the indicators presented within the Socio-Economic Monitoring Plan (SEMP) may need to be modified to ensure continuity to other project-specific socio-economic monitoring programs in Nunavut. The GN recommended that Sabina further collaborate with the Proponent, the GN, the Kitikmeot Inuit Association (KIA), and INAC to finalize the *Draft* Terms of Reference for the SEMP and establish a project-specific socio-economic working group. The GN further recommended that the Proponent's participation in the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) be reflected within the project certificate, decision dependent. Within its response to the 2016 final written submissions, Sabina indicated that it had no outstanding concerns with the GN's recommendations and provided suggested minor amendments to INAC's proposed terms and conditions to reflect the refinement to the

[734] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.
[735] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 409, lines 2-10.
[736] Sabina Gold & Silver Corp. and Government of Nunavut, Exhibit 95, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016, pp. 3-4.
[737] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.
[738] Indigenous and Northern Affairs Canada, 2016 Final Written Submission, March 7, 2016.

socio-economic monitoring program focus on monitoring the indicators as presented in the Back River Socio-Economic Monitoring Plan.[739]

Following the issuance of the 2016 Final Hearing Report, the NIRB received, and/or was copied on, correspondence from several parties and individuals including members of the public; former Sabina employees; an investor; a group of Elders; the hamlets of Kugaaruk, Cambridge Bay, Gjoa Haven, Taloyoak, and Kugluktuk; businesses; the Cambridge Bay Community Advisory Committee; the Northwest Territories & Nunavut Chamber of Mines; the Kugluktuk Hunters and Trappers Organization; the Spence Bay Hunters and Trappers Association; and the World Wildlife Fund to the NIRB and/or the Minister of Indigenous and Northern Affairs regarding the Report and the Board's decision. Many of these parties expressed support for Sabina and the Project owing to their confidence in the potential for positive economic impacts. For descriptions of commentary related to specific Valued Socio-Economic components, see sections 5.2: Employment and 5.4: Contracting and Business Opportunities.

5.1.3 Views of the Board

As expressed in the 2016 Final Hearing Report, the Board finds that the information provided by Sabina with respect to economic development and opportunities generally represents a fair assessment of the baseline conditions and represents a comprehensive assessment of potential effects. The Board generally agrees with Sabina's conclusions that the Project could result in economic growth, diversity, and performance. The Board further acknowledges that Sabina has recognized limitations of its economic modelling framework and notes the conclusions, as presented in the FEIS, that actual project-induced effects could be greater than predicted with the application of proposed mitigation and benefit enhancement measures. However, the Board still cautions that depending on multiple variables, including the variability of the economy over time, the actual benefits, taxes, and royalties to accrue may similarly be less than predicted. Although the Board recognizes the difficulties in quantifying the exact value of these benefits at this point, even if the actual economic benefits realized are at the very conservative end of the potential range, the potential economic benefits remain positive and significant.

Within the 2016 Final Hearing Report, the Board noted the statement in the FEIS that economic "modelling was not conducted for the reclamation and closure or post closure monitoring phases, which will have substantially lower expenditures and, thus, lower total impact on the economy"; economic modelling or effects assessment do not appear to have been conducted for temporary closures.[740] As no new or additional information was presented during the supplemental Review of the Project, the Board still does not find that the Proponent has given adequate quantitative or qualitative consideration to the potential impacts to the local and regional economy that could result from temporary or final closure. The Board acknowledges Sabina's position that an expected increase in capabilities and capacity of individuals and companies associated with the Project would be retained post-project employment and that the overall condition, including flexibility and adaptability, of the economy and presence of other employment and business opportunities during reclamation would influence the nature of any effects.[741] However, the Board cautions that depending on the timing of a project-closure, whether temporary or permanent, the expected level of capabilities and capacity in the local economy may not have reached levels expected, and/or there could be limited local demand for those capabilities and experience. The Board expects improved estimates to be provided following issuance of a Project Certificate, and that

[739] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[740] FEIS, Volume 9, Appendix V8-3B, Section 2, p. 2-3.
[741] FEIS, Volume 9, Section 3, p. 3-60.

the experience of other mining projects and regions in Nunavut that have experienced temporary or final closures, such as the Doris North Gold Mine and the Jericho Diamond Mine in the Kitikmeot region, could be used. While the Board understands that potential negative effects resulting from a temporary or early closure could be the result of a larger economic downturn and not directly or solely attributable to the Project, additional and quantifiable details regarding impacts to the communities of Cambridge Bay and Kugluktuk, the Kitikmeot region, and the territory as a whole were lacking, as were proposed measures to help mitigate various impacts, which may result from mine closure(s).

The Board recognizes the importance of institutions receiving applicable updated information for planning purposes and agrees that communication with the Government of Nunavut (GN) regarding major decisions may be helpful to the territorial government in relation to fiscal planning. The Board acknowledges the commitment made between the GN and Sabina during the 2016 Final Hearing that the Proponent would provide relevant financial information to the GN for tax purposes; however, the Board recognizes that the Proponent cannot be required to disclose project-specific information of a proprietary or confidential nature.

During the 2016 Final Hearing, the Board asked Indigenous and Northern Affairs Canada (INAC) to clarify the composition of the Back River Socio-Economic Working Group and whether individuals and representatives of community groups, such as the Burnside Hunters and Trappers Organization, would be involved in the Working Group "*so that they have a better understanding of what is going on in their backyard".*[742] INAC responded that the project-specific socio-economic working group would be comprised of INAC, the Kitikmeot Inuit Association (KIA), the GN, and Sabina; the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) would include representatives from the hamlets, hunters and trappers organizations, and other potentially impacted stakeholder groups from each community in the Kitikmeot region. During the K-SEMC meetings, the Back River Socio-Economic Working Group would provide updates to inform the Committee of the work undertaken at the regional level, including interpretation of any project-induced results and effects.[743]

The Board agrees with the general recommendations and commitments put forth by the GN, INAC, and Sabina to collect and analyze project-specific socio-economic data and develop a project-specific monitoring program in collaboration with agencies, affected communities, and the K-SEMC. The Board further recognizes that this type of working group would be useful for the monitoring and mitigation of several socio-economic factors, and not only those related to economic development. The Board also appreciates Sabina's commitment to support and participate in regional and territorial socio-economic monitoring efforts and programs, as well as its stated commitment to collect and provide analysis of socio-economic data related to the Back River Project.

5.1.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, including the letters of support from organizations and community members regarding the potential for project-induced socio-economic benefits, the Board believes that the Project's potential effects to economic development and opportunity could be appropriately managed

[742] A. Maghagak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 587-588, lines 16-26 and 1-9.
[743] T. Fast, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 587-589.

through the commitments provided by the Proponent and application of key mitigation measures associated with updating the proposed Socio-Economic Management Plan and completing an analysis of the risk of temporary mine closure, and implications to local communities.

The Board recognizes the value of the work proposed to be undertaken by Sabina and other parties through the formation of a project-specific working group. The Board believes that this type of working group will be useful for the monitoring and mitigation of several socio-economic factors, and not only those related to economic development. Therefore, the Board generally recommends the development of a project-specific socio-economic monitoring program, and collaboration with a variety of socio-economic stakeholders to establish a socio-economic working group that has the authority to address all socio-economic monitoring and mitigation. Reflecting these recommendations, the Board has included terms and conditions encouraging the Proponent to undertake the following (a brief summary of these recommendations is provided below for ease of reference only; see Section 8: Recommended Project Specific Terms and Conditions for the complete wording of the recommended terms and conditions):

- Participation and coordination with the Kitikmeot Socio-Economic Monitoring Committee along with other agencies and the communities of the Kitikmeot region to identify mutual interests and socio-economic priorities for the Project and the Kitikmeot region;
- Establishing a Back River Socio-Economic Monitoring Committee for the Project to develop and oversee the Back River Socio-Economic Monitoring Program, in collaboration with other socio-economic stakeholders (e.g., the Kitikmeot Inuit Association, the Government of Nunavut, Indigenous and Northern Affairs Canada, and communities of the Kitikmeot region); and
- Developing, in collaboration with relevant stakeholders, a Project-specific Back River Socio-Economic Monitoring Program to monitor, adaptively manage and mitigate project-induced socio-economic effects.

To specifically address the Board's concerns about the potential for adverse effects on the region if the mine temporarily closes, the Board has also included terms and conditions as follows (a brief summary of these recommendations is provided below for ease of reference only; see Section 8: Recommended Project Specific Terms and Conditions for the complete wording of the recommended terms and conditions):

- Requiring that the completion of an analysis of the risk and potential for effects associated with a temporary mine closure, giving consideration to how communities in the Kitikmeot region may be affected by temporary closure of the mine be provided to the NIRB within six (6) months of the issuance of a Project Certificate and then updated as circumstances warrant; and
- Requiring that within three (3) months of the Proponent completing this initial analysis or updates to the analysis of the risks and potential effects of temporary mine closure, the Proponent is required to update its Socio-Economic Management Plan to include defined measures to address the risks and mitigate the potential effects of temporary closure.

5.2 EMPLOYMENT

5.2.1 Views of the Proponent

Sabina discussed its assessment and proposed mitigation and benefit enhancement measures with regards to employment opportunities in Volume 8, Section 3 of the FEIS. Within Volume 8, Sections

3.5.3 to 3.5.6, Sabina concluded that the Back River Gold Mine Project (Back River Project or the Project) would result in overall positive residual effects to employment opportunities from changes to income, employment levels, and capacity of the labour force. However, Sabina further predicted that employment opportunities with the Back River Project could also result in the potential for negative residual, residual cumulative, and transboundary impacts from increased competition for labour. Through the application of proposed mitigation and enhancement measures, Sabina determined that the potential negative impacts to competition for labour would be not significant.

Sabina considered the following two spatial assessment boundaries for its effects assessment on employment:

- *Local Study Area (LSA)* – The west Kitikmeot region, including the communities of Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, and Kugluktuk.
- *Regional Study Area (RSA)* – The west Kitikmeot region and the east Kitikmeot region, specifically the communities of Gjoa Haven, Taloyoak, and Kugaaruk, as well as the city of Yellowknife, Northwest Territories.

Sabina predicted that any project-induced effects to employment and income levels, labour force capacity, and competition for local labour would result from direct procurement and hiring by the Back River Project. Potential effects to employment were anticipated to predominantly occur during the mobilization, construction, and operation phases, with any potential changes occurring during reclamation, closure and post-closure monitoring to occur to a lesser extent.

Employment, Income Levels, and Labour Force Capacity

Sabina predicted that the Back River Project would result in positive residual effects on employment resulting from increased income and employment levels as well as the capacity of the labour force. Using outputs from the DYNATEC economic impact model, Sabina estimated that approximately 25% of on-site employees would be Inuit and that 74% of total direct, indirect, and induced employment opportunities to be generated during mobilization and construction in Nunavut would be sourced from the Kitikmeot region, which would represent approximately 65 job opportunities and 2.7% of the region's experienced labour force. Sabina further projected that an average of 700, and up to 895, semi-skilled, skilled, and professional staff would be employed during the operation phase with the opportunity to sign longer-term contracts than during previous project stages. Sabina expected that throughout the duration of operations, approximately 293 job opportunities would be held by Nunavut residents, including 195 positions sourced annually from the Kitikmeot region. Sabina stated that all direct hires in Nunavut would be sourced from the Kitikmeot region. Further using model outputs, Sabina estimated that the Project could generate an estimated $36.2 million in personal income to Nunavut during mobilization and construction, including $27.4 million to Kitikmeot employees (which would account for approximately 75.7% of total project-related personal income generated to the territory).[744] Sabina estimated that during operations, total income generated to the Kitikmeot region would be approximately $219 million. Sabina further predicted that average personal incomes of employees from the Kitikmeot region would be 1.7 times higher during mobilization and construction, and 1.6 times higher during operations compared to 2010 median incomes.

Sabina discussed the potential for positive effects to the Kitikmeot region as a result of higher than average incomes associated with the Project, including: increased household food security and

[744] All monetary amounts are in 2015 Canadian dollars.

harvesting activities, improved general wellbeing, and potential for personal investment in housing and savings. Potential negative impacts associated with increased average incomes were noted to include, but not necessarily result in, drug and alcohol consumption and abuse and other negative social behaviours (for more information see Section 5.9: Health and Wellbeing).

Sabina predicted that through direct and indirect employment, training, and procurement opportunities, the capacity of the labour force in the Kitikmeot region, specifically as relates to skills and experience, would be increased. Sabina projected that general work experience, diverse sets of transferrable job roles and skills, and training opportunities — including on-site apprenticeship programs and opportunities to obtain professional credentials or certificates — would increase the diversity of skill sets and capacity of Kitikmeot residents, which could be retained post project employment. Due to current capacity levels and experience with mine-related employment and business contracts, as well as the proximal location to the Back River Project, Sabina projected that it would source the majority of its local hires from Cambridge Bay and Kugluktuk, followed by Gjoa Haven, Taloyoak, and Kugaaruk. To mitigate an expected lack of regional capacity to fulfill job requirements, Sabina committed to employing multiple measures including: preferential hiring of contractors with northern hiring requirements; training provisions; and collaboration with local Inuit organizations, education providers, and governments to identify opportunities to partner and implement training programs for Inuit beneficiaries, including the development of a regional training organization. Sabina would maintain a regional office in Cambridge Bay.

Sabina detailed its proposed workforce mitigation, enhancement, and monitoring measures associated with employment levels, income, and capacity within its Human Resources Management Plan, available in Volume 10, Part 28 of the FEIS. Specific measures proposed to retain project benefits for local residents, enhance employee retention, and minimize worker turnover include financial management training, career development, cross-cultural and gender-sensitivity orientation, and a workforce transition strategy to assist employees' post-project employment. The plan further includes labour relations, preferential recruitment, and worker transition strategies and provides details for the hiring of an Inuit Employment and Training Coordinator.

Competition for Local Labour

Sabina predicted that the Back River Project would result in negative residual impacts for a limited number of specific comparable job categories as a result of competition for local labour. Sabina predicted with medium confidence and moderate probability of occurrence that potential project-related negative residual impacts would be not significant due to the expected nature of any effects, including low magnitude, medium duration, sporadic frequency, confinement to the LSA, and reversibility. Sabina predicted that as a result of high comparable wages and demand for skilled labour by the Back River Project, individuals employed in the Kitikmeot region may terminate their positions in favour of project-related employment through direct employment and procurement. It was projected that only a small number of operations would be impacted and that the geographic extent would primarily be confined to Kugluktuk and Cambridge Bay, as residents are more experienced with mine-related employment and are located in close proximity to the Project (with little competition expected in eastern Kitikmeot communities). Using past northern experiences, including those associated with the Doris North Gold Mine in the Kitikmeot region, Sabina predicted that any competition of labour would likely affect hamlet employees and workers currently employed with local construction companies and housing associations with transferable skills sets such as heavy equipment operation, mechanics, and other trades. Sabina suggested that over time the expected increase of skills and experiences of the local labour force as a result of the Project would counterbalance any negative

effects. Sabina further projected that while employment through the Back River Project could further result in competition related to traditional harvesting activities, it expects that the proposed two-week rotation schedule would enable engagement in both traditional and modern economies.

Sabina further predicted that the simultaneous development of the Back River Project and one (1) or more future projects could create more substantial strain on local organizations and businesses related to competition for local labour and could result in a negative cumulative effect. Sabina predicted with medium confidence that any project-related negative cumulative residual effects would be not significant and would be unlikely to be experienced by more than a few organizations/businesses. The predicted nature of any potential effects related to significance criteria and likelihood of occurrence were the same as predicted for residual effects and described above. Sabina predicted that the Back River Project could also result in negative transboundary effects by affecting the labour supply in Yellowknife, Northwest Territories, as it expects "a number of" employees to be city residents.

Sabina developed mitigation measures to address potential project-induced residual, residual cumulative, and transboundary effects resulting from competition to labour. Mitigation measures were focused on developing the labour force and assisting communities to manage and prepare for expected increases in demand for labour through informing businesses, organizations, and hamlets throughout the RSA of its hiring requirements, schedule, and procurement practices prior to the commencement of the mobilization and construction and operation phases. Sabina stated that through specific measures, which were detailed within the Human Resources and Community Involvement plans, individuals and employers would be enabled to make informed and proactive decisions with respect to careers and staffing.

No new information on employment was provided in the FEIS Addendum.

5.2.2 Views and Concerns of Interested Parties

The Government of Nunavut (GN) noted within its 2016 final written submission that pursuant to the *Apprenticeship, Trade, and Occupations Certification Act* and associated regulations, all apprenticeships must be registered with the GN – Department of Family Services.[745] The GN also requested that Sabina provide a detailed staff schedule with the associated National Occupational Classification code to assist in the identification of government-led programs and services that could be delivered to increase local employment as well as to undertake occupational supply and demand modelling. Within its response to the 2016 final written submissions, Sabina agreed to share, consistent with obligations established under the Inuit Impact and Benefit Agreement, apprenticeship-related information and staff schedule details with the GN. Sabina further agreed to integrate information and data related to employee support programs and training through annual reporting associated with the Back River Socio-Economic Monitoring Program Annual Report. During the 2016 Final Hearing, the GN further clarified that "*if the government's career development officers have access to the skills and education requirements for available positions, they will be able to more effectively advise their clients and better match them with relevant education and training programs and possible funding sources*".[746] The GN noted that Sabina committed to providing a staff schedule six (6) months prior to each project phase and report on in-house training through the Back River Socio-Economic Monitoring Program. The GN did not note any

[745] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.

[746] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 410, lines 11-17.

outstanding concerns.[747]

Within its 2016 final written submission, Indigenous and Northern Affairs (INAC) also commented on the labour force needs and projections as presented within the FEIS, noting that:

> Understanding the socio-economic benefits of the updated project as a result of employment is important for reviewers. Having a solid understanding of the types of jobs available and their skill requirements, in association with the skills profile of the local labour force will enable parties to plan ahead in terms of management and mitigation and allow for the maximum socio-economic benefit possible should the project proceed.[748]

INAC concluded that a comprehensive analysis of the labour supply against labour demand qualifications was not undertaken. INAC stated that consequently, the method and accuracy of employment projections were unclear and requested that Sabina provide an updated analysis and employment impact assessment prior to the 2016 Final Hearing. Within its response to the 2016 final written submissions, Sabina referenced its 2015 Economic Impact Model Report provided in the FEIS and stated that the report utilized updated project employment projections and information related to labour demand and supply in the Kitikmeot region.[749] Sabina added that the types of inputs and outputs used were similar to those presented in other environmental assessments for northern mining projects. During the 2016 Final Hearing, INAC indicated no outstanding concerns with Sabina's response.[750]

During the 2016 Final Hearing, multiple Intervenors and Community Representatives raised questions regarding potential project related employment opportunities during and post-project development. The North Slave Métis Alliance asked Sabina what considerations it had with regards to employment and business opportunities for Aboriginal people in the Northwest Territories (NWT). In response, Sabina noted that currently all business development activities are focused within the Kitikmeot region, with no classification specific to the NWT or other northern areas.[751] A Community Representative from Gjoa Haven further asked whether "*each community is going to have a set amount of people employed*".[752] Sabina noted in response that it intends to maximize Inuit employment with preference given to the Kitikmeot communities, including Gjoa Haven as a 'key area for employment', to establish training programs to enable individuals to meet the hiring requirements. It was further stated that while there are no established hiring thresholds, hiring would likely be included within the Inuit Impact and Benefit Agreement (IIBA) to be negotiated with the Kitikmeot Inuit Association (KIA).[753] A Community Representative from Kugaaruk further noted that "*once mining has completed, we want to see jobs available during and after mining*".[754] In response, Sabina discussed the potential benefits to Inuit employees post-project employment, particularly resulting from the acquisition of transferrable skills,

[747] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 410, lines 1-26.
[748] Indigenous and Northern Affairs Canada, 2016 Final Written Submission, March 7, 2016, p.31.
[749] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[750] T. Fast, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 570-571, lines 17-21.
[751] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 362, lines 9-18.
[752] P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 820, lines 9-14.
[753] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 820-821, lines 17-26 and 1-14.
[754] M. Anguti, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 836, lines 24-25.

noting that:

> *Sabina intends to do everything reasonable to have a -- a lasting type legacy within the communities of - - of skills. It's one of the big things we can leave. We can leave people better trained and better educated to transition into other roles. Mining doesn't last forever. It does have a finite life … But making sure we leave people trained and help them transition is an important aspect*".[755]

Board staff questioned Sabina on considerations given to the potential competition for skilled labour resulting from the Hope Bay developments.[756] Sabina noted that the Hope Bay Project was considered in the cumulative effects assessment as presented in the FEIS and clarified that it used many of the same if not all of the same assumptions that were used in the original feasibility work conducted for Hope Bay by both project proponents Miramar and Newmont. Further, Sabina outlined discussions with TMAC Resources Inc., the current Proponent for the Doris North Gold Mine Project, which is located near Cambridge Bay in the Kitikmeot region, and noted that the companies do not want to create a competition for labour and are focused on maximizing Inuit employment across both projects. Sabina further projected that this would be discussed with the KIA during the negotiation of the IIBA.[757]

Board staff similarly asked the KIA whether the IIBA currently being negotiated with Sabina would take into account the elements of the IIBA recently negotiated by the KIA for the Doris North Gold Mine Project, recognizing the potentially limited available labour pool in the Kitikmeot region, and whether the objectives related to maximizing Inuit employment would differ between the two (2) agreements.[758] The KIA noted in response that the IIBA with Sabina is currently being negotiated and that:

> *As part of our negotiated agreements with industry, we'll always try to maximize Inuit employment at any major development project. But more generally, in any specific negotiation, we're looking to satisfy KIA's interests in regards to the circumstances around that development*.[759]

Board staff clarified that:

> *Specifically what I'm -- why we're asking is with regards to an earlier discussion in the proceedings regarding the proponent's assertions about potential employment from this project, benefits to the region through employment, and the Board's requirement to assess whether or not those predictions are accurate. So that's where we're coming from with this is to understand whether an Inuit Impact Benefit Agreement that is being negotiated as you've indicated would it tend to focus on employment as one of the major benefits, or whether in the Kitikmeot Inuit Association's view, contracting opportunities in another area might be a larger driver given*

[755] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 837, lines 14-25.
[756] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 363-364, lines 5-9 and 12-21.
[757] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 363-364, lines 11-26 and 1-9.
[758] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 658, lines 1-12.
[759] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 658, lines 14-19.

another development in the region.[760]

The KIA noted in response that "we always try to maximize all aspects of benefits listed in Schedule 26(1) of the *Nunavut Agreement* that are matters that can negotiated in an IIBA" and that it expects the completion of the IIBA would satisfactorily mitigate any additional socio-economic concerns.[761] Board staff further asked whether the KIA supported the findings and recommendations provided by the GN and INAC for the Back River Gold Mine Project with regards to Sabina's socio-economic impact assessment. The KIA noted that it supports the review and work undertaken by INAC and the GN, and noted that:

> *Specifically regarding the socio-economic monitoring committees and - - and regional committees that are proposed as part of the monitoring of this project, KIA's perspective is that our focus is on our unique bilateral relationship with the company through the IIBA to optimize socio-economic benefit to Kitikmeot Inuit and the region. And in regards to participation in the committees, you know, our focus is on the IIBA implementation. It's standard to have committee -- an implementation committee to work on implementing matters that are negotiated within the IIBA, and our participation in the socio-economic monitoring of the region through the systems that INAC or Indigenous and Northern Affairs Canada and the Government of Nunavut has set up are more optional to KIA.*[762]

Community Representatives further discussed and asked many questions regarding minimum age requirements for project-related employment and potential employment opportunities for youth (for discussions related to youth education and training initiatives see Section 5.3: Education and Training). The GN and Sabina discussed territorial legislation and regulations preventing people from under the age of 18 working at a mine site, particularly due to the nature of the work and potential dangers and associated liabilities.[763] Questions on alternative employment opportunities were raised, including the following from a Community Representative of Behchokǫ̀:

> *Youth is so important. The youth of Kitikmeot. It's really -- they're the future, and it's good to integrate them, and at the same time, they're learning right now. For summer employment for the youth. I know 18 and under, they can't go to the mine, but can Sabina provide funding for local organization, local government or construction, hotels, lodges, anything? Provide funding to give these local organizations to hire summer students 18 and under. Construction job, basic construction, answer phones, do filing, take messages for the youth that cannot go to the mine. Summer employment for them.*[764]

In response, Sabina specified that the focus of its funding would be placed on the needs of Kitikmeot

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[760] R. Barry, Board staff, NIRB 2016 Final Hearing Final No. 12MN036 Transcript, April 27, 2016, pp. 658-659, lines 22-26 and 1-10.

[761] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 659-660.

[762] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 660-661, lines 20-26 and 12-19.

[763] See for example M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, p. 819, lines 20-25. L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1126, lines 21-26.

[764] P. Rabesca, Behchokǫ̀, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1045, lines 1-12.

residents as would be related to the Project and not to create employment opportunities in general. However, it further noted that there would be opportunities for community members, specifically youth, which could include working in the Cambridge Bay Liaison Office.[765] Sabina noted later during the 2016 Final Hearing that the legislation and regulations related to minimum age limits on a mine site would apply to all components from the Goose Property to the Marine Laydown Area. However, it was acknowledged that while opportunities may be limited, youth under the age of 18 could potentially be involved in off-site project-related community engagement initiatives, such as the Bernard Harbour Project, where "the rules may be different".[766]

Multiple Community Representatives, as well as Intervenors, from Nunavut and the NWT raised concerns that the potential risk to the natural environment, particularly caribou, would not offset the potential benefits, particularly from employment, and further raised concerns that commitments made may not be followed through by Sabina:

> *But I have a mixed feeling of hearing from other Metis too, like, what damage has done to their land. Like, it made me think twice to see what happened to their land. Like, that's why safety is very high for me. Like, have you guys done any research properly. Do we believe that? Like, after hearing some different stories, like, sometimes it's hard to believe.*[767]
>
> *… when the job goes ahead, is it a promise to our native people that there will be guaranteed job for the presenters that you guys gave us?*[768]
>
> *Now, in the Northwest Territories, the predicted socio-economic improvements of these projects have fallen short. Hiring targets for aboriginal people have not been met. Promises of training programs have been broken. And parallel with this, the Bathurst herd has collapsed.*[769]
>
> *… the mining company … they can say a lot of positive things. They can promise a good IBA and a good money in return. They can say a lot of good positive things … And also, they can say that our family members or our people will be employed. And they also can say that they will have a lot of young people on-the-job training. Today we do not even have that.*[770]
>
> *I like the idea of my future children and my grandchildren from the mining company. I used to think that it's good because, um, they going to have healthy economy, but after hearing all the people in here, I change my mind because I was thinking of all your technology. I was so convinced every time I hear about the mining that all your technology is safe and everything, high quality, and then I thought of Mother Earth. You know Mother Earth is not going to - - your*

[765] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1047, lines 3-15.
[766] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1127, lines 3-15.
[767] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 840, lines 1-7.
[768] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 840, lines 17-22.
[769] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 756, lines 11-21.
[770] A. Crapaud-Baillargeon, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 913, lines 11-19.

high quality is not going to stand up to Mother Earth. Have you considered that?[771]

In response, Sabina discussed its caribou baseline studies and use of Traditional Knowledge and reiterated its objective to maximize employment, which would be included within the IIBA.[772] Sabina further discussed the difficulties in maintaining balance between economic and environmental considerations, noting that the project design takes potential risk into account, as well as the role of regulatory authorities and use of checks and balances, such as closure bonding.[773]

In closing remarks, a Community Representative from Gjoa Haven commented on concerns raised by representatives of the NWT during the 2016 Final Hearing and asked "*if you guys can just enlighten us a little bit and give us some sureties on - - that we won't be having the same issues in Nunavut that they've experienced in the NWT*".[774] Sabina noted in response that:

> *In regards to the commitments that have or have not been kept in the Northwest Territories, I would say that we have a different situation in Nunavut. In Nunavut, we have settled land claims. Our - - the surface rights owner is the Kitikmeot Inuit Association, and within that framework, there are safeguards in land tenure and other places that are -- are there to mandate that we do keep our commitments, and particularly with that, to employment and - - and jobs and training*.[775]
>
> *In terms of shutdown of operations and, again, staged shutdowns such as that we have offered in these -- these hearings, you know, we have -- we work from stockpiles, and the premise being that running those stockpiles through the plant could work as long as we envision any potential shutdown. In terms of a complete shutdown, you know, that would be a very difficult premise for any operation, and not only for the company, but for the people that work there that -- to be sent home and – without compensation, you know, is very difficult, not only from an economic prospect, but from a life and family and -- and also from a safety of operations. We've said you have to maintain water works; you have to maintain safety of -- of -- of infrastructure. And it's -- and it's very difficult to completely shut down those.*[776]

In response to questions raised by a Community Representative in Cambridge Bay, Sabina noted that it would require employees to pass a criminal record check; while not intended to be exclusionary it would include particular and significant activities, particularly to ensure the safety of individuals on-site.[777]

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[771] R. Kayuqtut, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 928-929, lines 18-26 and 1-2.
[772] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 842-843, lines 9-26 and 1-18.
[773] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 928-932.
[774] P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1310-1311, lines 24-26 and 1.
[775] B. McLeod, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1311, lines 11-20.
[776] B. McLeod, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1312-1313, lines 24-26 and 1-14.
[777] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 812, lines 10-14 and pp. 814-815, lines 23-26 and 1-7.

Through closing statements, multiple Community Representatives, including those from Gjoa Haven, Taloyoak, Kugluktuk, and Kugaaruk noted their support of the Project proceeding due to potential for employment opportunities:

> A*s you know, Gjoa Haven, one of them, the biggest problems in Gjoa Haven is that we don't have a lot of jobs, and for that reason alone, Gjoa Haven is in favour of Sabina starting the mine impact review*".[778]
>
> *In terms of the Kugluktuk Taliqas [phonetic], we are in favour of the mining company going forward to create employment for our young people. And, as well, we have conditions so that you -- as long as you respect the policies that we put forth, we will respect your work in terms of mining in the area, but we also have to work together. Please don't forget these -- our neighbours from Northwest Territories, they have concerns that we listen to; so keep that in mind. Please support them as well.*[779]
>
> *So I cannot tell you at this time if we supported it or not, but we wanted you to consider, for example, it's very, very expensive for food in Cambridge Bay because from here on, everything is going -- the cost of our groceries is going higher and higher. Today, we are not relying on -- we are relying on funding, income, and we have bills, like power and other utilities. For that reason, I would like to support that we -- our younger generation, the young people, they have to have income. They have to make money. They have to earn money to survive and to support their family. So therefore, we are supporting Sabina to open a mine.*[780]
>
> *They also told us that they will be hiring Inuit from surrounding communities in our region. The reason I supported that is because I want our younger generation to have jobs, to have employment, employment and training. They promised to hire younger people from the communities in our region. For that reason, and also as soon as I saw this, I supported it*. [781]

Following the release of the NIRB's 2016 Hearing Report for the Project, the Board received and/or was copied on, correspondence from several parties and individuals, several with prior work experience at the Back River Mine site, expressing support for the Back River Project and potential resulting employment opportunities, including the following excerpts:

> We want Back River to move forward for jobs and benefits. … The project is important to us and our families. There are lots of people who need jobs. Our community needs jobs.[782]
>
> I worked at Goose Lake and I liked it. I wouldn't mind working there again. I support Sabina Back River Gold Mine.[783]

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[778] P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1327, lines 15-18.
[779] L. Taipana, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1326, lines 4-12.
[780] J. Ashevak, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, p. 1329, lines 10-22.
[781] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1330-1331, lines 22-26 and 1.
[782] *External Correspondence to the NIRB and the Minister of Indigenous and Northern Affairs:* Letter from the Kugluktuk Angoniatit Association Re Support – Back River Gold Mine Project, NIRB File No. 12MN036, July 6, 2016.
[783] *External Correspondence:* Letter from C. Kikoak Re Support – Back River Gold Mine Project, NIRB File No. 12MN036, July 12, 2016.

> … I've worked in George Lake also Goose Lake and it was wonderful, I Have Learned a lot of things … I think it would be Great if It Reopened I know that They Had Good employees and many Great Different Job's …[784]
>
> … Please grant Sabina the necessary permits to allow them to commence construction of the Mine and eventually a flourishing mining operations which will pose no harmful threat to the environment and which will employ many young people in Kugaaruk and also throughout the region.[785]

During the supplemental Final Hearing, both the Kitikmeot Inuit Association (KIA) and Board staff raised questions with regards to the potential for competition for skilled Kitikmeot Inuit labour as a result of multiple mining projects operating in the Kitikmeot region. The KIA asked Sabina to clarify how it proposed to fulfill its Inuit hiring objectives if it and TMAC Resources Inc. (TMAC) would both be hiring Inuit employees and had similar hiring objectives – the latter for the Doris North Gold Project, an operating gold mine in the Kitikmeot region. Sabina acknowledged in response that as a result of available Inuit labour and potential increased demand from multiple mines as well as community organizations – as well as the Doris North Gold Project having the earlier opportunity to source local labour – Sabina would need to focus on its training efforts to maximize Inuit employment. Sabina also clarified that its intention was to meet its 20% to 30% Inuit employment objective and not to take skilled labour from other operations or organizations. Sabina further explained that it would use lessons learned from operating mines in Nunavut that faced both successes and challenges with regards to fulfilling their Inuit hiring objectives. Sabina also discussed ways that Kitikmeot communities could benefit financially from the Project in addition to employment opportunities, including through royalty payments to Nunavut Tunngavik Incorporated and the Government of Nunavut (GN), the Inuit Impact and Benefit Agreement it is currently negotiating with the KIA, and through company community donations.[786]

Board staff similarly asked Sabina whether there were any ongoing or planned coordination efforts to address potential competition for skilled Kitikmeot Inuit labour between the Back River Project, the Doris North Gold Mine Project, and any mines operating in the Northwest Territories. Sabina stated that it would be amenable to undertaking such conversations with TMAC, if the Project were to be approved, and emphasized that its focus was on maximizing Inuit employment in the region and creating additional opportunities than what are currently available.[787] In response to follow-up questions raised by Board staff on plans it had to make the company an employer of choice that could result in overall positive effects for Kitikmeot Inuit, Sabina noted that "*we had a great number of people return to our project this year, and they wanted to. There's actually letters on the record of employees writing in, you know, in support because they do like our project. They like the way we do things. They like our approach.*"[788]

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[784] *External Correspondence to the NIRB and the Minister of Indigenous and Northern Affairs:* Letter 2 from G. Putuguq Re Support – Back River Gold Mine Project, NIRB File No. 12MN036, July 12, 2016.

[785] *External Correspondence to the Minister of Indigenous and Northern Affairs:* Letter from the Hamlet of Kugaaruk Re Support – Back River Gold Mine Project, NIRB File No. 12MN036, July 12, 2016.

[786] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 330-332, lines 14-26, 1-26, and 1-26.

[787] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 343-344, lines 1-26 and 1-20.

[788] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 345, lines 14-20.

Sabina added that on-site work culture, as well as expressions of individual culture, is a priority and it aims to ensure that employees have comfortable facilities, lines of communication to their families, and receive proper financial compensation.[789] Sabina clarified that there would be no limits on the competition for skilled Inuit workers and that the Project "*will create more opportunities for Inuit employment and more competition for workers. We believe the healthy competition between the companies is generally good for workers.*"[790]

A Community Representative from Kugluktuk also asked the GN how it proposed to follow up on Sabina's proposed Inuit employment rates. Within its response, the GN noted that it had engaged with mining companies on how it could best support related employment opportunities and listed some of the government departments that provide programs and support related to the mining industry. It was further noted that emphasis had been placed on helping people prepare themselves for employment and identifying potential barriers to employment, such as availability of childcare and addressing addictions.[791]

Following the presentation by the KIA during the community roundtable, a Community Representative from Gjoa Haven described situations where youth were trying to gain employment with mines and had difficulties doing so "*after they fill the form, they didn't -- they didn't go to work. Some of them, they go to work, but some of them, they don't get a good job. And they go to work in the morning and then let go sometime*."[792] Within its response, the KIA noted that its career development officers receive and distribute resumes from Kitikmeot Inuit to mining companies and also provide training opportunities through partnerships with the Nunavut Arctic College. The KIA further explained that while it is not involved in the hiring process for individual mines, its staff are available to assist Inuit in addressing concerns that may arise.[793]

A Community Representative from Gjoa Haven further commented on difficulties associated with youth graduation rates and asked the KIA if youth would be able to gain employment without a high school diploma. In response, the KIA described some of the high school graduation incentives available to youth, for example, providing graduating awards to youth in the Kitikmeot communities.[794]

The Community Representative from Gjoa Haven asked if Elders would have employment opportunities based on Inuit Traditional Knowledge.[795] The GN noted in response that there are opportunities for

[789] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 345-346, lines 1-26 and 1-11.
[790] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 356, lines 16-20.
[791] See for example: B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 913-914, lines 2-26 and 1-19 and L. Kamermans, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 936-938, lines 15-26, 1-26, and 1-17.
[792] S. Qitsualik, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 866, lines 1-5.
[793] P. Emingak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 866-868, lines 22-26, 1-26, and 1-8.
[794] P. Emingak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 870-872, lines 13-26, 1-26, and 1-5.
[795] M. Aglukkaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 940, lines 17-23.

Elders to provide Traditional Knowledge to potential users and asked how Sabina would use Traditional Knowledge and how they collect Traditional Knowledge with respect to this project.[796]

The KIA and multiple community representatives noted their support of potential employment opportunities with the Project, both during commenting periods at the supplemental Final Hearing and during closing remarks:

> *For socioeconomic benefits, jobs, contracting, business opportunities, and financial compensations, Inuit have the opportunity to negotiate an Impact Benefit Agreement. As indicated in the KIA presentation, we are negotiating land tenures, water, and wildlife compensation agreements, and an IIBA on behalf of Kitikmeot Inuit. These agreements with Sabina must be finalized and approved by the KIA Board before the Back River Project can proceed. On the understanding that Sabina will fulfill its -- all its NIRB commitments and that Sabina and KIA can reach full agreements in their negotiations, KIA is pleased to offer full support for this project.*[797]
>
> *I am in support of Sabina because young people have to find work. They have to learn how to provide for themselves. So I'm in support of Sabina opening a mine at Back River, and I want to see young people be - - I want to see young people work* [798]
>
> *Yes, it's good to see that there's going to be employment opportunities for people. There are young people that are unable to stand up on their own two feet and provide for themselves. There are some that are unable to find employment.*[799]
>
> *First of all, I would like to thank Sabina, who are proposing to open a mine and preparing to open a mine, should your project be approved. I would like to see many people employed there, including our children, which are generations to come.*[800]
>
> *The grandchildren just graduated in springtime. They always - - always ask him - - ask him when you're graduated, what you're going to do. He always say, I'm going to be working in the mine like my … Dad.*[801]
>
> *I'm an Elder. I want to say there's some mining, the work - - mining work and want to study in the north. I'm really happy when they want to come to the country to start the mining. I'm really, really happy you did have a meeting with the communities. And people want to get a job*

[796] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 944-945, lines 12-26 and 1-5.
[797] S. Anablak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, P. 1046, lines 8-20.
[798] J. Qiqurt, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, p. 686, lines 3-7.
[799] M. Aglukkaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, p. 691, lines 20-25.
[800] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 693, lines 2-16.
[801] J. Ugyuk, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 707, lines 20-25.

from the -- from the mine.[802]

We would also like to seek employment for long-term positions once you are approved and you're in the hiring process.[803]

Sabina has an opportunity to be an employer of choice and model operation if approved.[804]

We would like to support -- the community of Gjoa Haven supports Sabina. We'd like to see the project go ahead. We want to see jobs open, and if the project is to proceed, there are many terms and conditions that are -- that would be your responsibility. Perhaps some need tweaking.[805]

We all understand that the members of our community and us that are here, we are in support of Sabina Gold & Silver's project proposal. We only have a very few places to work in our community. There are many people that work for the Hamlet, but jobs are very hard to find. We want to see our youth that are -- that attend school have a better future. We would like to see them work in the mining industry.[806]

5.2.3 Views of the Board

In the 2016 Final Hearing Report, the Board noted the comments and requests by the Government of Nunavut (GN) and Indigenous and Northern Affairs Canada (INAC) regarding labour force analyses and occupational supply and demand modelling and agrees that up-to-date labour force projections would be important for many parties in planning, managing, and monitoring socio-economic benefits that may be realized. The Board agrees that updated labour market information is essential to obtaining an accurate understanding of the current labour supply and demand situations for both the Kitikmeot region and Nunavut as a whole, and well as providing indicators for future needs. Furthermore, this information would be required by the GN for the development and provision of education and training opportunities to Nunavummiut. The Board agrees with the recommendation, provided by Sabina and the GN during the 2016 and supplemental Final Hearings, that the Proponent consult other agencies to monitor the impacts the Project may have on regional labour force characteristics, and that this work should be continued throughout the life of the Project in order to identify trends and patterns in the data and to accurately compare these with predictions made within the FEIS. The Board appreciates Sabina's commitment to provide detailed staffing information to the GN as well as to include information and data on employee support and training programs through annual reporting associated with the proposed Back River Socio-Economic Monitoring Program.

During the 2016 and supplemental Final Hearings, the Board noted multiple questions by Community

[802] O. Alakannuark, Kugaaruk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 710, lines 11-17.
[803] C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p.1017, lines 14-16.
[804] J. Palongayak, Kugluktut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 1022-1023, lines 25-26 and 1-2.
[805] P. Akkikungnaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1026, lines 12-17.
[806] J. Ugyuk, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1027, lines 4-12.

Representatives, representing Kitikmeot communities as well as groups from the Northwest Territories, the KIA, and NIRB staff regarding potential employment opportunities. During the 2016 Final Hearing, the Board heard some statements and questions that suggested concern that opportunities would not be equal among the communities. The Board asked Sabina to clarify the percentage of jobs that could be created by the Project for Nunavummiut, and specifically for Kitikmeot residents. Sabina responded that its economic impact model utilized a 30% Inuit hire rate and that its focus was to maximize Inuit employment opportunities and "*to hire as many Nunavummiut and specifically as many residents of the Kitikmeot region that are Inuit beneficiaries at the project as possible"*.[807] Sabina qualified this by acknowledging that it can be challenging to meet hiring objectives, particularly with multiple projects hiring from the same area, and noted assumptions that this would be a part of the Inuit Impact and Benefit Agreement (IIBA) discussions with the Kitikmeot Inuit Association (KIA).[808]

As expressed in the 2016 Final Hearing Report, the Board found that the Proponent's impact predictions for this area would have benefitted from additional information having been supplied by the KIA regarding how the required IIBA might be designed to address specific concerns, had negotiations been more advanced. The Board was further concerned with the potential difficulties Sabina could face in meeting Inuit and Kitikmeot hiring objectives due to the potential competition for labour between the Back River and Doris North gold mines. The Board notes the additional clarification provided by the Sabina during the supplemental Final Hearing regarding how it plans to meet its Inuit employment objectives.809 The Board appreciates the Proponent's willingness to discuss potential coordination efforts with TMAC Resources Inc. to address potential competitions for skilled Kitikmeot Inuit labour between the Back River Project and the Doris North Gold Mine Project.810 The Board further acknowledges the Proponent's recognition of the potential increased demand on skilled Inuit labour in the Kitikmeot region and agrees that Sabina would need to focus on its training efforts to maximize Inuit employment. However, the Board remains concerned with the potential difficulties Sabina may face in meeting Inuit and Kitikmeot hiring objectives due to the potential competition for labour between the Back River and Doris North gold mines. However, the Board also recognizes the potential for positive effects to result from competition for employment of local Inuit, such as increasing choice of employers and increasing wages offered for skilled labour. As the KIA administers Inuit Impact and Benefit Agreements for development in the region, the Board believes the KIA would be well-positioned to ensure that potential competition for employment between operators is not used as the sole justification for failing to meet hiring objectives without alternative means of recruitment and retention being explored adequately (e.g., increasing wages, offering additional benefits or training programs, surveying the labour pool, etc.).

Similarly, the Board acknowledges Sabina's prediction in the FEIS that the Project could result in competition for local labour with regional businesses and organizations, as well as traditional harvesting activities. The Board appreciates that the assessment as presented in the FEIS included a list with detailed description of sectors expected to be most affected. The Board further acknowledges Sabina's

[807] J. Prno, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 372, lines 1-4.
[808] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 371-373.
[809] See: M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 330-332, lines 14-26, 1-26, and 1-26.
[810] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 343-344, lines 1-26 and 1-20.

proposed mitigation measures, such as informing local businesses, organizations, and hamlets of its hiring requirements.

In response to associated questions raised by the Board during the 2016 Final Hearing on the proposed flight arrangements for Kitikmeot employees to the Back River Gold Mine site, Sabina noted that Kugluktuk and Cambridge Bay are currently designated as direct pick-up points as they are proposed direct points of hire. Direct flights would be considered for Taloyoak, Gjoa Haven, and Kugaaruk if the numbers of community members hired were sufficient. It was further clarified during both the 2016 and supplemental Final Hearings that efforts would be made to reduce the need for Kitikmeot employees to transfer to Yellowknife, Northwest Territories as a larger city centre to travel between their home communities and to the mine site.

Many comments and questions were raised by Community Representatives with regards to youth opportunities associated with the Project, and the Board acknowledges and supports the interest in and suggestions for further youth consultation and engagement. The Board understands the legislative and regulatory limitations Sabina must abide by and acknowledges the potential off-site project-related opportunities for youth that may not meet minimum age requirements to work on a mine site.

While the Board heard multiple concerns from Community Representatives as well as transboundary Intervenors during the 2016 Final Hearing that expected benefits may not materialize and/or would not outweigh the potential negative effects and risks to the environment, relatively few related comments were expressed during the supplemental Final Hearing. The Board still considers these concerns to not be indicative of doubts about Sabina's assessment of projected benefits, but primarily concerns about who has the authority to exercise the oversight required to ensure that the Proponent delivers on their promises with respect to predicted benefits. The Board notes this concern and has included recommendations in Section 5.6.4: Cumulative Effects Conclusions and Recommendations of the Board to regulatory authorities and the landowner that will assist these parties to increase their capacity for effective oversight and enforcement of commitments.

Lastly, the Board acknowledges comments and closing remarks by numerous Community Representatives of the Kitikmeot communities during both the 2016 and supplemental Final Hearings who noted their support of the Project due to the potential employment opportunities. The Board further acknowledges the many letters from parties, including members of the public and former employees of Sabina Gold & Silver Corp., in support of the Back River Gold Mine Project and potential employment opportunities. The Board greatly appreciates the time that parties took to express their opinions and to effectively engage in its Review of the Project.

5.2.4 Conclusions and Recommendations of the Board

The Board notes consistency in Sabina's responses during both the 2016 and supplemental Final Hearings. In considering the views of the Proponent and those of the parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to employment could be appropriately managed through the commitments provided by the Proponent and application of key mitigation measures associated with updating the analysis of the available labour force and providing additional clarity regarding how the Inuit Impact and Benefit Agreement may address project-specific impacts and concerns.

The Board further acknowledges the potential for employment benefits to accrue to Nunavummiut, as well as residents of the Northwest Territories, as noted by the Proponent and other parties during the Hearing. The Board recognizes the need for accurate information to inform various training and development plans, as was noted by the Government of Nunavut (GN) and Indigenous and Northern Affairs Canada (INAC), and therefore recommends the following terms and conditions (the following text provides a summary of these requirements; the full text of these terms and conditions are included in Section 8: Recommended Project Specific Terms and Conditions):

- Encouraging the preparation and submission to the Nunavut Impact Review Board of detailed staff schedule information (e.g., type and quantity of positions and skills required of Project employees for each Phase of the Project) in consultation with the Government of Nunavut and as is consistent with any Inuit Impact Benefit Agreement with the Kitikmeot Inuit Association; and
- Encouraging identification and registration of all trades, occupations, journeypersons, and apprentices working with the Project and sharing this information with the Government of Nunavut and the Nunavut Impact Review Board.

5.3 EDUCATION AND TRAINING

5.3.1 Views of the Proponent

Sabina discussed its assessment and proposed mitigation and benefit enhancement measures with regards to education and training in Volume 8, Section 3 of its FEIS. Within Volume 8, Section 3.5.3.4, Sabina concluded that the Back River Gold Mine Project (Back River Project or the Project) would result in overall positive residual effects at the local and regional levels from increased demand for education and training by Kitikmeot residents and changes to youth attitude and behaviours toward education and training. Within its explanation of potential effects excluded from the assessment, Sabina clarified that changes to regional curriculum, need for local labour force training, and long term community capacity building were not assessed as a potential project effects.

Sabina considered the following two spatial assessment boundaries for its effects assessment on education and training:

- *Local Study Area (LSA)* – The west Kitikmeot region, including the communities of Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, and Kugluktuk.
- *Regional Study Area (RSA)* – The west Kitikmeot region and the east Kitikmeot region, specifically the communities of Gjoa Haven, Taloyoak, and Kugaaruk, as well as the city of Yellowknife, Northwest Territories.

Sabina predicted that any project-induced effects to education would predominantly occur during the mobilization and construction and operation phases, with any potential changes occurring during reclamation and closure and post-closure monitoring to occur to a lesser extent.

Increased demand for Education and Training

Sabina predicted that project-related employment and contracting opportunities and associated workforce and skill requirements would create an increase in demand for education and training opportunities, predominantly by Kitikmeot residents interested in securing employment with the Back River Project. Potential desired opportunities identified included high school and general education

diplomas, general skills upgrading, Nunavut Arctic College programs, project-specific training, or on the job training. Sabina projected that this increase in demand could result in multiple indirect effects, including the following scenarios: the establishment of additional training programs in the Kitikmeot region associated with mine employment; reduced overall demand for education and training programs in the region as a result of on-site training; and/or greater availability of training programs in the region.

As previously noted, Sabina expects to partner with local governments, educational institutions, Inuit organizations, and other mining proponents to contribute to the development of long-term capacity building programs through either the creation of a regional training facility or additional relative training programs offered through the NAC. Sabina noted that it has further established a fund of $1.4 million held in trust by the Kitikmeot Inuit Association to be used for various community oriented programs, including training and education. Sabina projected that demand could either occur prior to mobilization and construction or not until specific employment opportunities become available. Sabina concluded in its residual effects assessment that although logistical challenges currently exist with regards to attracting skilled instructors, sourcing housing for NAC instructors, and teacher retention, there is regional capacity within the NAC to provide increased training opportunities with support from the Back River Project. It was indicated that primary and secondary school class sizes, infrastructure, and administration would not be affected by the Back River Project as Sabina predicted that project employees and their families would not relocate to the Kitikmeot region.

Youth Attitudes and Behaviour towards Education and Training

Sabina anticipated that the development of the Back River Project would have the potential to change youth attitudes towards education by increasing general and mining specific youth interest in education and training, including increased school attendance rates. Sabina noted that there is a current disconnect within the Kitikmeot region between education and employment opportunities, particularly by younger generations. Sabina projected that through awareness of different types of employment opportunities and associated educational requirements, including observations of local residents obtaining training and subsequent employment with the Back River Project, this disconnect could be reduced, resulting in increased interest in education. Sabina suggested that in addition to positive impacts to youth via changing attitudes towards education and training, youth with parents engaged in project employment could experience a more routinized environment conducive to regular school attendance and later success in the job market. Sabina further stated that the Back River Project would promote participation in the wage economy for Kitikmeot residents, including youth. Sabina also observed through its baseline studies that students enrolled in pre-trades programs in Kugluktuk were much more likely to graduate, become employed, or continue their education following high school graduation compared to students not enrolled in the program. Sabina committed to developing training plans specific to individual positions once candidates are selected, as plans would be based on individual education, experience, and previous training.

Sabina detailed its proposed mitigation and enhancement measures, including the development of Workforce Transition and Workforce Training strategies, within its Human Resources Plan, available in Volume 10, Part 28 of the FEIS. Specific measures proposed to enhance the experience, education, employee retention, and skill levels of the local workforce included: developing strategic partnerships; contributing to local programs and training initiatives; providing in-house training and career development; establishing youth mentorship programs; and employing an Inuit Employment Training Coordinator.

No new information on education and training was provided in the FEIS Addendum.

5.3.2 Views and Concerns of Interested Parties

Within the parties' respective 2016 final written submissions, the Government of Nunavut (GN)[811] and Indigenous and Northern Affairs Canada[812] (INAC) commented on the proposed strategies related to training and youth engagement as outlined within Sabina's Human Resources Plan. The GN stated that any proposed training initiatives should not interfere with territorial education programming and recommended that Sabina collaborate directly with the GN – Department of Education prior to delivering any planned training initiatives, particularly related to youth employment. INAC noted that there was a lack of details provided in the FEIS and associated plans regarding the types of education and training programs to be provided and proposed strategic partnerships. INAC requested that Sabina provide additional information prior to the 2016 Final Hearing on proposed training plans, existing programs Sabina could be contributing to, and a gap analysis of existing programs. In response to INAC's submission, Sabina stated that details of specific programs would only be finalized if a project certificate was issued, project financing secured, construction decisions made, and the Inuit Impact and Benefit Agreement finalized. Sabina noted that training opportunities would be tailored to project needs and individual employee/position requirements and provided a list of minimum training programs to be provided. Sabina further outlined a list of expected partnerships and noted that results of its training programs would be tracked through the Back River Socio-Economic Monitoring Program. During the 2016 Final Hearing, Sabina and the GN submitted an agreed upon commitment that Sabina keep regional education staff informed of planned or requested activities involving community schools.[813] During its presentation at the 2016 Final Hearing, the GN noted that it was satisfied with Sabina's commitment to inform the GN-Department of Education's regional office of plans to participate in public school events.[814]

A Community Representative from Cambridge Bay questioned Sabina on whether the Community Liaison Officer

> *is willing to work closely with the youth outreach worker to develop age-appropriate presentations to deliver to the schools in Cambrdige [sic] [Cambridge] Bay and to talk about the Back River project because the youth are the future, and they will be - - they will be kind of the result of what the closing of this mine will be. It's good for them to know that this is what is going to happen, et cetera.*[815]

Sabina noted in response that it would continue to develop methods of communication with youth and that it was "*quite happy to come up with a better communication medium for the students*".[816] *Sabina further* re-iterated commitments to engage students at different academic levels (i.e., elementary, high

[811] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.
[812] Indigenous and Northern Affairs Canada, 2016 Final Written Submission, March 7, 2016.
[813] Sabina Gold & Silver Corp. and Government of Nunavut, Exhibit 95, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016, p. 4.
[814] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 409, lines 11-22.
[815] T. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1027, lines 5-12.
[816] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1028, lines 14-15.

school, and post-secondary).[817]

Multiple questions were raised by Community Representatives regarding youth training opportunities. A Community Representative from Taloyoak asked Sabina if there were "*any scholarships available for the Kitikmeot region to attend college or post-secondary".*[818] In response, Sabina noted that it had been collaborating with the KIA, the GN, and the Nunavut Arctic College on a training working group process. It was stated:

> *We're cautious to commence training until we have a construction decision, and then when we do, we're -- focus in on training that can lead to more immediate jobs. So through discussion, the Kitikmeot Inuit Association has been hosting different training programs within the region. I don't have all the details in front of me, but things like work readiness have been done in some of the communities, first-aid trainings and safety trainings have also been done. And then there's some other training courses that the 20 Kitikmeot Inuit Association have been doing.*[819]

Sabina clarified that training would be 'ramped up' once "*we make a construction decision, once we have the approvals in place, and once we are confident that we can have the financing in place".*[820] Sabina further noted that it has proposed to make one (1) secondary education scholarship available, which it expects to discuss further with the KIA as part of the IIBA negotiations.[821] In response to a question raised by a Community Representative from Cambridge Bay on whether "*it would be possible for those students that have dropped out of their education [to] have some kind of training for work at the mines"*,[822] Sabina clarified that high-school attainment would not necessarily be a condition of employment and that education and experience would both be considered during hiring.[823] Sabina similarly noted that with regards to youth employment, it would consider developing summer student programs, meeting all regulations and hiring requirements such as minimum age, for youth to gain on-site experience.[824]

A Community Representative from Kugluktuk asked Sabina to clarify if it "*would apply funding for communities - - to communities for summer student employment to get them - - youth involved? Maybe doing research before even start setting up"?*[825] In response, Sabina discussed past involvement with third party summer camps and classes held in Cambridge Bay with regards to science and technology. Sabina stated that it would consider potential related opportunities and noted the potential to engage

[817] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1028-1029, lines 19-26 and 1-4.
[818] P. Quyutinuak Jr., Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1055-1056, lines 26 and 1-2.
[819] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1056, lines 10-20.
[820] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1056, lines 21-24.
[821] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1057, lines 19-25.
[822] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 812, lines 21-24.
[823] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 816, lines 2-3.
[824] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 818-820.
[825] C. Westwood, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1136, lines 12-15.

primary or secondary schools or even community youth groups.[826] A Community Representative from Gjoa Haven similarly asked if mine equipment simulators would be provided to the communities for youth to practice and gain experience prior to mine employment. Sabina responded that it would consider the use of simulators when developing its training programs.[827] For additional discussions on youth employment, see Section 5.2.2: Employment.

During closing statements at the 2016 Final Hearing, a Community Representative for Gjoa Haven commented on the importance of education and noted that:

> *We would encourage Sabina to send a representative to our schools in our community, to encourage kids to stay in school and maybe show them the opportunities that are available to them if they should just stay the course in school and work on getting a good education and maybe making them aware of all the good possibilities that are out there.*[828]

Community Representatives asked for further clarification on the specific types of apprenticeship opportunities that would be available, with one representative from Kugaaruk noting to the GN:

> *There will be a lot of different projects if the mine is - - go ahead. There will be a lot of projects from carpentry, plumbing, electrician, welders. Being that -- and most of those courses will take about four years to take. Would be nice to have our young fellows there on - - be a lot of kids that are Grade 12 graduates, college foundation graduates, to approach them to - - and encourage them to take the course will really benefit to their future*.[829]

In response, the GN discussed the types of government programs available, including the trades access course through the Nunavut Arctic College and a new pre-apprenticeship program available in Rankin Inlet that could provide the foundations for mine-related employment opportunities.[830] In response to the GN's comment, Sabina reiterated that it had not yet developed detailed programs and that the programs as described by the GN as well as "*preparing yourself for apprenticeship and taking those initial exams, and that would put you in a very good place to be employed on the - - on the site*".[831] It was further noted by the GN that in 2015, the Nunavut Arctic College received the highest number of applicants from the Kitikmeot Region, with 50 of 60 currently enrolled, who could potentially take advantage of future project-related employment opportunities.[832]

Community Representatives raised additional concerns of the high cost of housing in Nunavut, with a Community Representative from Taloyoak asking the GN what support it would provide to the

[826] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1136-1136.
[827] W. Carson, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1127-1128, lines 18-24 and 2-9.
[828] P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1327-1328, lines 26 and 1-6.
[829] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1128, lines 18-26.
[830] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1129, lines 3-22.
[831] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1130, lines 1-4.
[832] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1130, lines 19-26.

communities to assist in decreasing the unemployment rates.[833] The GN noted in response that it supports developments that can be reasonably managed and present a net benefit to Nunavummiut, which includes employment potential. The GN re-iterated its approach to increase skills through primary, secondary, and post-secondary programs and outlined additional mine related programs and initiatives, such as the environmental technician program and availability of career development officers in the communities, and funding support available through Nunavut Arctic College.[834]

In response to questions raised by a Community Representative from Cambridge Bay on the potential for a project-specific work readiness program and whether the GN and Sabina would collaborate to provide such a program, Sabina noted its intentions to deliver a related program in the communities that have shown an interest and are meeting hiring goals.[835] The GN noted that it had assumed a prominent and significant role in developing Baffinland Iron Mine Corp.'s work-ready program for the Mary River Iron Mine and would support a similar initiative undertaken by Sabina.[836]

In response to questions raised by a Community Representative from Taloyoak on whether Inuktitut or Inuinnaqtun language training would be available on-site to employees, Sabina noted that it would support the use of Inuktitut or Inuinnaqtun on-site as long as it does not create a safety concern. It was further noted that training opportunities in Inuktitut or Inuinnaqtun would be examined.[837]

During the supplemental Final Hearing, Community Representatives discussed and raised questions with regards to potential training opportunities and associated services to be provided by both Sabina and the Government of Nunavut (GN). A Community Representative asked Sabina "*when will the trades program begin to - - to be applicable to those that want to learn trades and work for your company"?*[838] In response, Sabina noted that training opportunities would gradually ramp up once construction commenced and that trades opportunities would begin 'in a couple years' once initial training was completed.[839] In response to subsequent questioning on the length of training, Sabina clarified that the majority of training would be provided on-site during scheduled work rotations, and if not, efforts would be made to offer training opportunities in Kitikmeot communities.[840]

In response to a request for information from a Community Representative from Taloyoak on mining related training available to Kitikmeot residents, the GN noted the need to provide training opportunities in communities throughout the Kitikmeot region and described mining related programs

[833] S. Tulurialik, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1137-1138, lines 18-26 and 1-6.
[834] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1137-1139.
[835] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1146-1147, lines 8-26 and 1-6.
[836] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1147, lines 8-16.
[837] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1055 and 1057, lines 21-26 and 6-18.
[838] J. Ugyuk, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 107, pp. 702-703, lines 26 and 1-2.
[839] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 704-705, lines 19-26 and 1-21.
[840] J. Prno, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 818-819, lines 1-26 and 1-14.

currently offered through the Nunavut Arctic College (NAC) as well as potential future opportunities.[841] The GN further acknowledged that mining and trades related education programs available in the Kivalliq region could be used as a model for the Kitikmeot and Baffin communities and noted that discussions are being undertaken with regards to potential training opportunities.[842] A Community Representative from Gjoa Haven further asked the GN whether there would be funding cutbacks to NAC programs. In response, the GN noted that while there could be funding restrictions for NAC programs, it was unaware of any restrictions to participation. The department further discussed the development of mining related programming offered through the NAC as well the formation of the Kivalliq Mine Training Society, with a focus on providing mine related training opportunities, and noted the potential for a similar initiative to be undertaken in the Kitikmeot region with the involvement of multiple parties including the NAC, Inuit organizations, federal government, and mining companies.[843]

A Community Representative from Kugaaruk commented on the need for education and asked the GN if it "*can help those that wish to continue their education for mine training.*"[844] The GN noted in response that in addition to its school system, it has multiple continuing education programs as well as nursing and law programs, and that it provides financial assistance and other types of associated assistance and support.[845]

In response to questions raised by a Community Representative from Kugluktuk on recognizing driving experience gained on mine sites and licensing options, the GN noted that it is working on addressing issues relating to issuance of licences, particularly testing opportunities.[846]

5.3.3 Views of the Board

The Board finds that comments and questions throughout the 2016 and supplemental Final Hearings, and particularly during the Community Roundtables, emphasized the importance of education and training opportunities for Nunavummiut, especially youth. The Board heard many questions and statements from Community Representatives on youth training opportunities, and as expressed during the 2016 and supplemental Final Hearings notes the importance of providing training opportunities for younger generations.[847] Acknowledging the training programs available in Nunavut, particularly programs offered through the Nunavut Arctic College, the Board commented during the 2016 Final Hearing on Sabina's proposed human resource plans and questioned whether it would consider sponsoring some of the mining-specific training programs currently being provided through the college. Sabina noted that it has provided guidance to a Kitikmeot Inuit Association (KIA) led focus group

[841] L. Kamermans, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 919-920, lines 5-26 and 1-26.
[842] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 921-922, lines 5-26 and 1-8.
[843] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 923-926, lines 23-26, 1-26, 1-26, and 1-7.
[844] O. Alakannuark, Kugaaruk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 928, lines 21-22.
[845] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 928-930, lines 1-26, 1-26, and 1-20.
[846] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 930-932, lines 24-26, 1-26, and 1-7.
[847] See for example A. Maghagak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 366, lines 11-14.

comprised of the KIA, Arctic College, and the hamlets of the Kitikmeot communities. Sabina added that it has further contributed funds to some mining-related courses in association with the Nunavut Arctic College and the KIA.[848] The Board similarly asked the Government of Nunavut (GN) if it would be prepared to offer mining-specific training programs through the Nunavut Arctic College for Inuit youth residing in Nunavut if the Back River Project were approved. The GN responded that the Nunavut Arctic College and the GN – Department of Family Services provide many programs and funding opportunities for Nunavummiut that could be applicable to project-specific work such as trades entrance exams and apprenticeship programs. The GN added that it has a mine training roundtable and associated fund that proponents can apply to with proposals for site-specific mine training.[849]

During the supplemental Final Hearing, the Board asked Sabina to clarify the types of training programs that would be provided to Inuit employees and whether these could be transferable to employment opportunities within the communities. Sabina responded that most training courses would be provided on-site, that employees would be provided with opportunities to continue to gain skills throughout their employment tenure, and that resulting skills would often be transferrable and useful to an employee post-mine employment.[850]

The Board further asked what types of training and apprenticeship programs would be available to youth and whether on-site training programs would result in certifications. Within its response, Sabina noted its Human Resources Plan as presented in the FEIS and outlined its plans to develop partnerships with the Nunavut Arctic College (NAC) and emphasized the amount and types of training that it expects its employees to receive while on site. Sabina clarified that there would be a record of all training and certificates obtained for each employee that could be used, and accessed, post-project employment. Sabina further noted that it would continue to engage high schools in the Kitikmeot communities and look for opportunities to provide summer jobs to students.[851]

The Board similarly asked the GN what types of engagement it could provide to people, including youth and Elders, to support the objective of obtaining employment associated with the Project, as well as what type of mining related education and training opportunities could be provided through the NAC. Within its response, the GN highlighted the benefits of mine-related training and noted that the NAC had recently established a mine training program that could enable Nunavut students to take mining related training in the Kitikmeot region.[852] Through a deferred response, the GN elaborated on the types of programs offered through the NAC that could be used in attaining employment in the mining industry – such as camp cook, mineral exploration field assistant, and environmental technology programs – noting that "*all of these programs are eligible for funding support from the Department of Family Services through their adult learning and training support program*".[853]

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[848] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 366-368.
[849] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 433-435.
[850] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 349-350, lines 1-26 and 1-22.
[851] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 353-354, lines 2-26 and 1-22.
[852] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 466-469.
[853] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 558, lines 4-7.

During both the 2016 and supplemental Final Hearings the Board found that Sabina demonstrated willingness for adaptive management through discussions on youth engagement and communication and appreciates the associated recommendations provided by Community Representatives.

The Board acknowledges the collaborative work undertaken by parties and commitments made with regards to training and a possible work-readiness program, however finds that there was a lack of information provided on the details related to the content and execution of such a program. The Board further acknowledges and appreciates Sabina's stated intentions with respect to implementing training opportunities and agrees that these would be an essential factor toward development of the local labour force. The Board notes the GN's role in developing and providing access to various training programs and opportunities and recognizes the importance of institutions receiving applicable updated information for planning purposes and acknowledges commitments made by Sabina for further communication with the GN. However, the Board finds that questions and comments by Community Representatives during both the 2016 and supplemental Final Hearings indicate either a potential lack of understanding of the education and training opportunities available, effectiveness of training opportunities, and/or a need for additional mine-specific training opportunities in the Kitikmeot region. This highlights to the Board not only the need for training for mine-related opportunities but also ensuring that the potential candidates for related training are informed of the opportunities available. The Board acknowledges the GN's role in offering and facilitating such relevant training for Nunavummiut.

Lastly, the Board acknowledges and appreciates Sabina's statement during the 2016 Final Hearing that Sabina would give consideration to providing training opportunities in Inuktitut or Inuinnaqtun.

5.3.4 Conclusions and Recommendations of the Board

With respect to comments and concerns heard regarding a need for a variety of training and education opportunities and the transferability of skills, the Board recommends the following terms and conditions (the text below provides, for ease of reference a description of the terms and conditions in summary form, but the complete wording of the recommended terms and conditions is provided in Section 8: Recommended Project Specific Terms and Conditions):

- Encouraging collaboration between the Proponent and training organizations and/or government departments offering mine-related or other training to ensure that Project-specific training for employees provides additional opportunities for residents and employees to gain meaningful and transferable skills and certifications; and
- Developing and maintaining an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during project employment that can be transferred.

The Board also recognizes comments raised by agencies and members of the communities during both Final Hearings in terms of ensuring that there is a "fit" between educational opportunities provided in the region and the skills and requirements for employment at the Project. Accordingly, the Board recommends the following term and condition:

- Encouraging collaboration with potential stakeholders in the Socio-Economic Monitoring Working Group and with the Kitikmeot Socio-Economic Monitoring Committee to review and monitor education utilization rate trends for Project employees throughout the Project to

identify whether or not the Project's employees are accessing educational opportunities available to them in the Kitikmeot region and/or any Northwest Territories communities.

With respect to potential for on-site Inuktitut and/or Inuinnaqtun language training opportunities to be provided by the Proponent, the Board recommends that:

- Providing information to the NIRB in the annual Back River Socio-Economic Monitoring Report, regarding Inuktitut and/or Inuinnaqtun language training opportunities offered by the Proponent.

5.4 CONTRACTING AND BUSINESS OPPORTUNITIES

5.4.1 Views of the Proponent

Sabina discussed its assessment as well as proposed mitigation and benefit enhancement measures with regards to contracting and business opportunities in Volume 9, Section 3 of its FEIS. Within Volume 8, Sections 3.5.3 to 3.5.5 of the FEIS, Sabina concluded that the Back River Gold Mine Project (Back River Project or the Project) would result in positive residual effects to contracting and business opportunities from changes to the growth and diversity of Inuit and northern businesses, particularly as a result of project-related contract and sub-contract work. Sabina further predicted in Section 3.5.3 that project closure would result in negative effects on business opportunities and has proposed mitigation and enhancement measures to support the development of local businesses, including capacity building and increased experience, that can be retained after project completion.

The following two spatial assessment boundaries were considered for the effects assessment on contracting and business opportunities:

- *Local Study Area (LSA)* – The west Kitikmeot region, including the communities of Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, and Kugluktuk.
- *Regional Study Area (RSA)* – The west Kitikmeot region and the east Kitikmeot region, specifically the communities of Gjoa Haven, Taloyoak, and Kugaaruk, as well as the city of Yellowknife, Northwest Territories.

It was predicted by Sabina that the potential for the Back River Project to influence the establishment of new, or the diversification of existing, businesses, particularly for northern or Inuit organizations, would mainly occur during the mobilization, construction, and operation phases. Any potential changes occurring during reclamation and closure and post-closure monitoring were predicted to be notably lower.

It was identified by the Proponent that contracting and sub-contracting opportunities, specifically procurement of goods and services from local suppliers, as the main potential change associated with the Back River Project that would impact business opportunities. It was noted that associated increases in community retail and consumer-based business activity, as a result of increased purchasing power of local residents directly or indirectly employed through the Back River Project, would also be positively affected by the Project, albeit, to a lesser extent. Sabina projected that there would be an increase in the expansion or creation of businesses in anticipation of the Project and noted that supply and sub-contracting opportunities would comprise the majority of contracting opportunities during mobilization and construction and operations. Sabina identified the following potential benefits for Inuit and

northern businesses engaged with the Project through contracting or sub-contracting during these two (2) project phases:

- Increased experience and capacity through participation in the bid preparation and contract negotiations process, which could add to the value of a business;
- Use of revenues obtained through Project contracts to finance capital purchases such as equipment or to hire additional employees;
- Increased or improved business capital (e.g., for equipment purchases or upgrades);
- Increased experience, skill levels, and qualification of business employees; and
- Increased ability of locally-based businesses to meet community infrastructure and maintenance requirements.

Sabina predicted that through successful participation in project contract work during the mobilization and construction and operation phases, benefits to business opportunities associated with the Back River Project would continue to accrue to local communities, including those not associated with the Project, following the completion of the each phase. The predominant difference between expected effects during the operation phase compared to mobilization and construction was identified in the FEIS to be the availability of longer-term contracts. In addition, Sabina projected that the peak of contributions to GDP and personal income during the operations phase would result in increased demand and potential for local business development. Sabina predicted that the expected deceleration of business growth and associated project expenditures within the Kitikmeot region and Nunavut during reclamation and closure and post-closure monitoring could result in reduced employment and an associated loss of income. Sabina indicated that the regional retention of capacity and experience developed during the life of the Project could offset some of the expected negative effects of project closure on businesses development. Sabina projected that during a temporary closure, not only would Inuit and northern business growth and diversity decelerate, but business spending habits could be altered in response to changes in project status. Sabina predicted that this would indirectly affect any local service oriented businesses established as a result of increased economic demand during operations.

Within Section 7.2 of its Business Development Plan, Volume 10, Part 24 of the FEIS, Sabina discussed capacity challenges currently existing among local businesses in the Kitikmeot region limiting their ability to participate in the bidding process for project-related contracts. Sabina identified potential limitations to local businesses in meeting demand or accessing available opportunities that include: limited capital for investment; comparatively small company size; lack of, or inability to retain, skilled employees; lack of prior work experience; and/or lack of experience with the bidding process. Sabina noted that its Business Development Plan is an iterative document informed by lessons learned from similar projects operating in the north, including the Meadowbank Gold Mine in the Kitikmeot region, input from ongoing engagement with local businesses and entrepreneurs, and regulatory requirements. The overall objective of the Business Development Plan was identified to be the encouragement of involvement by local and regional Inuit-owned business in project-related work to both enhance benefits as well as to promote the retention of Project benefits within the Kitikmeot region and Nunavut. Specific elements included a procurement strategy, local business and entrepreneur capacity building strategy, and community-based investments for business development. Sabina proposed various enhancement measures, including the following, to facilitate the capacity of local businesses and entrepreneurs to participate in the Project:

- Provide long-term contracts, where feasible;
- Modify schedules (e.g., packaging contracts or breaking down larger contracts);
- Provide early notice to Inuit-owned businesses of upcoming contracts and details on proposal/bid requirements;
- Provide information to facilitate the ability of local and regional businesses to tender effectively for contracts (e.g., sources of training and certification); and
- Cooperate with local economic development agencies and educational institutions to encourage local business development (e.g., sponsor courses and workshops on business development and contract tendering) and develop supplier networks.

In Table 3.3-4: Potential Socio-Economic Effects Excluded from the Assessment, Sabina noted that a process for financial and other contributions would be detailed in the forthcoming Inuit Impact and Benefit Agreement to be signed with the Kitikmeot Inuit Association.[854]

The potential project effects on the economic wellbeing of Kitikmeot businesses was discussed in Volume 8, Section 3 of the FEIS Addendum under FHR-NIRB-5.4(A) – Potential Effects on Economic Wellbeing of Kitikmeot Businesses. Sabina noted that it had provided additional information to address the Board's conclusions in the 2016 Final Hearing Report that it was not confident that the proposed mitigation measures in the FEIS would adequately address the potential for temporary mine closures to adversely affect the economic wellbeing of businesses in the Kitikmeot region. Sabina concluded that none of the additional information presented in the FEIS Addendum would affect its conclusions with regards to the socio-economic assessment as presented within the FEIS.

Noting its history of operating in the Kitikmeot region, Sabina outlined some of the partnerships it has developed with companies based in both Nunavut and the Northwest Territories. Sabina reiterated its commitment within the Business Development Plan, provided within Volume 10, Section 24 of the FEIS, that it would provide contracting and procurement opportunities within Nunavut and specifically within the Kitikmeot region. Sabina noted that these commitments would be further defined within the Inuit Impact and Benefit Agreement that it was negotiating with the Kitikmeot Inuit Association. Sabina emphasized the importance of building capacity for local businesses and entrepreneurs to support businesses during a potential mine closure and also beyond the life of the Project. Sabina noted that it would undertake discussions with companies during the procurement process to ensure clear contractual obligations would be established and understood.

5.4.2 Views and Concerns of Interested Parties

During its presentation at the 2016 Final Hearing, the North Slave Métis Alliance (NSMA) noted that the "*proponent still has not made the commitment to bring members to visit the site. The proponent does not have regular committee meetings, nor does the project bring any employment or business opportunities proportional to the impact of the project*".[855] The NSMA recommended that Sabina commit to ongoing engagement with the NSMA, including site visits, regular community meetings, and employment and business opportunities. During its response to the presentation, Sabina noted that

[854] FEIS, Table 3.3-4: Potential Socio-economic Effects Excluded from the Assessment, Volume 8, Section 3, p. 3-38.
[855] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 726, lines 2-7.

while contracting and employment would likely be prioritized within the Inuit Impact and Benefit Agreement being negotiated with the Kitikmeot Inuit Association, it would also be contracting and hiring from other northern areas and regions, including the Northwest Territories. Sabina added that it currently works with numerous businesses from Yellowknife, and the Northwest Territories in general, and expects to continue to do so. [856] Sabina further committed to undertaking "a site visit or two with the members of the North Slave Métis Alliance."[857]

In its closing remarks at the 2016 Final Hearing, the Yellowknives Dene First Nation (YKDFN) discussed lessons learned through experiences with mining projects in the Northwest Territories and noted that when one (1) mine closed it provided payouts to mine employees but not to the contractors. It was further noted that a significant number of jobs at the mine site were contracted through First Nations development corporations, who were responsible for absorbing the associated financial costs of its workers losing employment.[858]

To try and ascertain the accuracy of Sabina's predictions that potential project-related employment would result in benefits to the Kitikmeot region, Board staff questioned the Kitikmeot Inuit Association (KIA) on whether it would view employment or contracting opportunities as a potential benefit and prioritize accordingly within the Inuit Impact and Benefit Agreement negotiations:

> *So that's where we're coming from with this is to understand whether an Inuit Impact Benefit Agreement that is being negotiated as you've indicated would it tend to focus on employment as one of the major benefits, or whether in the Kitikmeot Inuit Association's view, contracting opportunities in another area might be a larger driver given another development in the region. So I'll just pause for a moment to see if you're able to respond any further*.[859]

The KIA responded:

> *… we always try to maximize all aspects of benefits listed in Schedule 26(1) of the NLCA that are matters that can negotiated in an IIBA. Our responses are somewhat generic, and we recognize that, but we've -- we're not into those details yet with the company, and we don't have that information to provide you*.[860]

Following release of the NIRB's 2016 Hearing Report, the Board received correspondence from 1984 Nunavut, part of the 1984 Group of Companies, and Great Slave Helicopter Ltd. in support of the Back River Project and potential resulting contracting and business opportunities, noting specifically that:

> We have been fortunate to be awarded the catering and medical contract at the Backriver Project since our companies' inception in 2007. Services provided on site include the culinary and medical training of Inuit from the Communities of Cambridge Bay and Kugluktuk. …This

[856] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 751, lines 4-26.
[857] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 751, lines 4-7.
[858] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1302-1304.
[859] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 659, lines 3-11.
[860] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 659, lines 13-19.

> dedication from Sabina Gold and Silver Corp. to the communities in which they operate encourages our Inuit owned company, 1984 Nunavut to grow and allowed our company to retain a 67% Inuit hire base. …The relationship that 1984 Nunavut has built with Sabina Gold and Silver Corp. is based on our companies' mutual respect for the environment, the Inuit people, Inuit culture and the future economic development available to the Kitikmeot region.[861]
>
> Since the early 2000's GSH has worked closely with Sabina along with our local Indigenous partners Kitikmeot Helicopters. We have worked closely with community stakeholders to ensure the program was a success while exceeding the regulatory requirements. … Allowing this project to go ahead will have a strong positive impact on job creation and northern revenue generation.[862]

During the supplemental Final Hearing, the Government of Nunavut (GN) expressed its view that the Board's concerns as expressed in the 2016 Final Hearing Report regarding temporary mine closures on Kitikmeot businesses would be addressed through the Kitikmeot Region Socio-economic Monitoring Committee, the project-specific Socio-economic Monitoring Program, and the project-specific socio-economic working group.[863]

During its presentation at the supplemental Final Hearing, the North Slave Métis Alliance (NSMA) noted that "*we accept these risks for the benefits that this development promises to the communities. And so my final comment, then, is that the NSMA is not promised benefits from this development, and even though there are good plans, we're, at this time, unable to support this project*".[864] Sabina noted in response that "*we do commit to continue to engage with the North Slave Metis Alliance, and we do hope that there's some economic benefits that can be gained by both the party and your membership".*[865]

5.4.3 Views of the Board

The Board acknowledges comments by the North Slave Métis Alliance, expressed during both the 2016 and supplemental Final Hearings, with regards to desired consultation and engagement opportunities, as well as promised benefits, associated with potential project-related employment and business opportunities. In recognizing the limits on the Board's jurisdiction with respect to making recommendations directed at addressing socio-economic issues outside of the Nunavut Settlement Area, the Board simply notes that Sabina's commitment to further engage with the residents of the Northwest Territories with regards to potential employment, business, and contracting opportunities is appreciated.

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[861] *External Correspondence to NIRB:* Letter from 1984 Nunavut to the Nunavut Impact Review Board Re: Support – Back River Gold Mine Project, NIRB File No. 12MN036, August 31, 2016.

[862] *External Correspondence to the Minister of Indigenous and Northern Affairs:* Letter from Great Slave Helicopter Ltd. (2016) to the Minister of Indigenous and Northern Affairs Canada Re Support – Back River Gold Mine Project, NIRB File No. 12MN036, September 8, 2016.

[863] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 454-455, lines 21-26 and 1-17.

[864] S. Shiga, North Slave Métis Alliance, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 614-615, lines 25-26 and 1-5.

[865] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 616, lines 21-24.

The Board recognizes that contracting and business opportunities for Nunavummiut associated with the Project will be addressed through the Inuit Impact and Benefit Agreement (IIBA) and acknowledges the confidential nature of IIBA negotiations. However, the Board heard concerns shared by the Yellowknives Dene First Nation during the 2016 Final Hearing with regards to potential for adverse effects on contractors from temporary closure. While recognizing that specific provisions may be included within the IIBA which could limit the potential for these effects, the Board does not find that Sabina has provided sufficient detail with regards to mitigation measures that could address the potential for adverse effects to businesses and contractors resulting from a temporary closure. However, the Board further acknowledges the Government of Nunavut's statement provided during the supplemental Final Hearing that concerns raised during the 2016 Final Hearing Report would be addressed through the Kitikmeot Region Socio-economic Monitoring Committee, project-specific Socio-economic Monitoring Program, and project-specific socio-economic working group.[866]

5.4.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board concluded that it was not confident that mitigation measures had been designed to adequately address the potential for temporary mined closures to adversely affect the economic wellbeing of businesses of the Kitikmeot region. Following a review of the new material presented by Sabina in the FEIS Addendum and the supplemental Final Hearing, as well as the updated views of Parties, the Board believes that the Project's potential effects related to contracting and business opportunities could be appropriately managed through the commitments provided by the Proponent, specifically to report any key findings or recommendations with regards to the economic wellbeing of businesses of the Kitikmeot region within its annual reporting to the NIRB, and in collaboration with the Project Specific Socio-Economic Monitoring Committee.

5.5 POPULATION DEMOGRAPHICS

5.5.1 Views of the Proponent

Within Volume 8, Section 3.3.2 of its FEIS, Sabina noted that it did not expect the Back River Gold Mine Project (Back River Project or the Project) to contribute to changes in population size within the Kitikmeot region and discussed its rational for excluding the Population Demographics valued socio-economic component from its socio-economic effects assessment.

Sabina considered the following two spatial assessment boundaries for its effects assessment on population demographics:

- *Local Study Area (LSA)* – The west Kitikmeot region, including the communities of Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, and Kugluktuk.
- *Regional Study Area (RSA)* – The west Kitikmeot region and the east Kitikmeot region, specifically the communities of Gjoa Haven, Taloyoak, and Kugaaruk, as well as the city of Yellowknife, Northwest Territories.

Sabina acknowledged public concerns regarding the potential for the Back River Project to result in

[866] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 454-455, lines 21-26 and 1-17.

changes to population demographics, particularly from in-migration to the Kitikmeot region and specifically Cambridge Bay, as a result of indirect and induced project employment. Sabina expected that as a result of the fly-in/fly-out nature of the Project and the provision of on-site employee accommodation there would be no in-migration of southern hired employees to the Kitikmeot region during any of the proposed project phases. Sabina further noted that it did not expect that the Project would result in intra-regional migration, as there would be established pick up points in Cambridge Bay and Kugluktuk, as the main points of hire, and that additional pick-up points, specifically in the eastern Kitikmeot region, would be included if required. In addition, Sabina predicted that induced and indirect employment opportunities during mobilization and construction and operations would be filled by Cambridge Bay and Kugluktuk residents due to past experiences with mining related activities. Sabina concluded that due to the fly-in/fly-out nature of the Project there would be minimal interactions between local residents and non-residents.

Sabina predicted that following the conclusion of the mobilization and construction phase, the majority of workers hired from the Kitikmeot region would remain in the region and potentially gain employment with the Back River Project during operations. Sabina further predicted that while a few individuals may seek work outside of the region post mobilization and construction, the potential effects to population demographics would be of minimal extent and negligible. Sabina noted that although a few skilled individuals may emigrate from the Kitikmeot region following the operation, reclamation and closure phases, there could be employment opportunities associated with currently planned mining projects and developments in the region. Sabina noted that the extent to which out-migration would occur would be dependent on the economic conditions at that time and expected that any resulting effects to population demographics would be negligible and would not represent a meaningful change.

Sabina concluded that there would be no in-migration to the Kitikmeot region, particularly Cambridge Bay and Kugluktuk, during project reclamation and closure as a result of decreased demand for employees.

No new information on population demographics was provided in the FEIS Addendum.

5.5.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, Indigenous and Northern Affairs Canada (INAC) noted that Sabina's assessment did not consider the potential effects of out-migration of skilled workers on population demographics.[867] INAC recommended that potential project-induced impacts of out-migration of employees be considered and monitored through the Back River Socio-Economic Monitoring Program. Within its response to the 2016 final written submissions, Sabina noted that the 'number of employees who relocate' is included as a monitoring indicator within the proposed Socio-Economic Monitoring Plan.[868]

During its presentation at the 2016 Final Hearing, the Government of Nunavut (GN) noted that:

> *Employment prospects with major resource developments can cause demographic shifts that in turn can lead to fluctuations for demand on public housing. Although this is not expected to occur with this project, it is important that the situation is monitored to confirm the predictions,*

[867] Indigenous and Northern Affairs Canada, 2016 Final Written Submission, March 7, 2016.
[868] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.

and in the case of a deviation, allow the Nunavut Housing Corporation to respond through the alignment of its programs and long-term plans.[869]

For additional discussion on the GN's recommendation that Sabina undertake a voluntary housing survey, see Section 5.9.2: Health and Wellbeing.

No additional concerns were raised regarding population demographics during the 2016 Final Hearing. However, discussions were raised on the potential for Kitikmeot residents to have to relocate to Cambridge Bay or Kugluktuk as a condition of employment (see Section 5.2.2: Employment).

5.5.3 Views of the Board

No new or additional information or comments on the potential for the Back River Project to result in negative impacts to population demographics were provided within the FEIS Addendum or at the supplemental Final Hearing. While the Board acknowledges that Sabina has included the 'number of employees who relocate' as a proposed monitoring indicator within the Socio-Economic Monitoring Plan, it remains unclear whether the type of information collected would be sufficient in assessing potential project effects and adequacy of related mitigation measures with regards to potential project-induced migration between Kitikmeot communities.

5.5.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to population demographics could be appropriately managed through the commitments provided by the Proponent and application of key mitigation measures associated with the planned participation in the Kitikmeot Socio-Economic Monitoring Committee and monitoring of demographic changes affecting the communities of the Kitikmeot region.

The Board acknowledges the challenges which may be faced by the Proponent in monitoring certain socio-economic indicators independently, and has consequently provided recommendations in Section 5.1.4: Economic Development and Opportunities regarding the Proponent's participation in the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC). Further to this, the Board sets forth the following for the consideration of the K-SEMC and its membership in an effort to ensure that the monitoring of demographic changes affecting the communities of the Kitikmeot Region sufficiently captures any changes that may be the result of the Back River Gold Mine Project (the following provides a summary of the recommended term and condition for convenience; the full text of the term and condition is provided in Section 8: Recommended Project Specific Terms and Conditions):

- Encouraging the collection and sharing of project-specific information concerning the home community of employees and the number of employees that may have relocated to work at the mine, to the extent that sharing this information is consistent with and not limited by any Inuit Impact Benefit Agreement with the Kitikmeot Inuit Association.

[869] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 411, lines 13-20.

5.6 TRADITIONAL ACTIVITY AND KNOWLEDGE

5.6.1 Views of the Proponent

Sabina discussed its assessment and proposed mitigation measures with regards to traditional activity and knowledge in Volume 8, Section 4 of the FEIS. Within Volume 8, Sections 4.5 to 4.9, Sabina concluded that the Back River Gold Mine Project (Back River Project or the Project) would result in overall negative residual and cumulative effects to the Subsistence Economy and Land Use valued socio-economic component (VSEC) from changes in access to land and resources, experiences of the natural environment, and abundance and distribution of resources. Sabina further concluded that the Project would not have residual transboundary effects on subsistence harvesters related to increased access to land and resources in the Kitikmeot region from changes to distribution and abundance of resources.

Sabina noted that it had incorporated Traditional Knowledge provided by the Kitikmeot Inuit Association Traditional Knowledge report for the Back River Project[870] to establish the following two (2) spatial assessment boundaries for its effects assessment on its land use:

- Local study area (LSA) – The LSA encompasses an area of 226,042 hectares (ha) and is comprised of the project development areas (PDA) at the Goose Property, Marine Laydown Area (MLA), and proposed winter ice road corridors. The LSA extends to areas immediately surrounding project infrastructure.
- Regional study area (RSA) – The RSA encompasses an area of 2,115,813 ha and was defined as the area of land and water encompassing the Back River Project and consistent with the largest boundary of wildlife, regional marine, and terrestrial study areas.

Sabina focused its assessment of subsistence land use by community members of Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), Kugluktuk, and Cambridge Bay. Sabina estimated that 80 to 95% of Kitikmeot residents continue to participate in subsistence harvesting for nutritional and economic means and that trips on the land, harvesting, and country foods are an integral part of Inuit culture and the subsistence economy. However, it was reported that only 10 to 20 former residents of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo), as well as a number of Cambridge Bay residents, continue to use the LSA and RSA for subsistence harvesting activities. Distance, time, and skill levels were identified as inhibiting factors for extensive land use within the LSA and RSA. The potential for project effects on current land use activities was assessed through potential changes to: access to land and resources, experience of the natural environment, and abundance and distribution of resources. Sabina's cumulative effects assessment utilized multiple scenarios involving the Back River Project, Lupin Gold, Jericho Diamond, Doris North Gold, and George Gold and Silver mines, and Bathurst Inlet Port and Road (BIPR), Hackett River Base Metals Mine (Hackett River), and Phase 2 Hope Bay Belt Gold Mine (Hope Bay Phase 2) projects. The spatial and temporal boundaries of the cumulative effects assessment encompassed project and human activities in the western Kitikmeot region considered to have potential effects within the land use RSA that are relevant to current land use activities during the proposed project phases, including: mobilization and construction, operation, reclamation and closure, and post-closure monitoring (see Section 2.2.3: Project Phases).

[870] Kitikmeot Inuit Association. (2012). Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP). Prepared for Sabina Gold & Silver Corp. by Kitikmeot Inuit Association: Kugluktuk, NU.

Access to land and resources

To assess potential project impacts to subsistence use of land and resources within the LSA and RSA, Sabina focused on impacts to travel routes, camps and cabins, and harvesting. Sabina predicted that through the development of project infrastructure, associated land and resources would no longer be available by harvesters throughout all proposed project phases. Sabina further predicted that the physical presence of project elements during mobilization and construction and operations, including project infrastructure and related activities such as air, ship, and road transport, would result in harvesters changing their travel routes and use of land and marine areas within the LSA, which could affect use of the RSA. In addition, it was noted that project facilities remaining during post-closure monitoring, such as the Tailings Storage Facility and camps, would continue to act as barriers to land access in some areas. Sabina concluded that although changes to access within the PDAs could not be avoided, as land would be required for project development, the land and resources within the LSA are not unique and could be accessed elsewhere. Sabina further noted that in addition to project employment and associated income levels facilitating participation in land-use activities, project design was intended to minimize potential effects. Sabina anticipated that restrictions on access to land and resources within the land use LSA during the reclamation and closure phase would continue as a result of some workers remaining on-site during this phase. It was further outlined that there would be a minimal amount of disturbance during the post-closure monitoring phase as project equipment and facilities would have been removed and site remediation completed.

Sabina predicted with high confidence that the Project would result in negative residual effects to subsistence harvesters resulting from changes to access to land and resources, and that these effects would be likely to occur, occur periodically throughout the year, and be not significant, as the predicted geographic extent would be confined to the project footprint or LSA. Sabina further predicted that effects would be reversible with effort upon closure of the Project, affect a relatively small number of hunters, and would not have broader implications to the subsistence economy.

Through analysis of current land uses, Sabina concluded that it did not anticipate cumulative residual effects involving the Back River Project and the Lupin Gold, Jericho Diamond, or Doris North Gold mines. With medium confidence, Sabina predicted that there would be negative cumulative residual effects to subsistence harvesters resulting from changes to access to land and resources which would be likely to occur if additional projects were developed, and be not significant, as the potential effects were predicted to be sporadic, reversible upon reclamation and closure, and not widespread. Sabina projected that while restrictions to land use from the George Gold and Silver, BIPR, Hope Bay Phase 2, and Hackett River projects would constitute a notable change from baseline conditions, overall usage levels would not likely be affected, although the variety of land areas available for use would be reduced. Sabina predicted that the Project would not result in residual transboundary effects related to increased access to land and resources in the Kitikmeot region, due in part to the proposed mitigative design feature of only using winter ice roads, which would be used seasonally and not for public use.

Experience of the Natural Environment

Sabina predicted that potential project-induced negative effects to harvesters' experience of the natural environment at the PDAs would be dependent on sensory disturbances related to visual aesthetics, noise, air quality, and vibration. It was further predicted that throughout mobilization and construction and operations, these effects would deter travelling, hunting, trapping, fishing, gathering, and camping activities primarily within the LSA and extending to the RSA related to air traffic and summer marine shipping. Sabina stated that harvesters' experience of the natural environment could be further affected by project-related shipping activities, air traffic, the proposed winter ice road and associated

traffic, operation of heavy equipment, blasting, and project facilities and consequent changes to the visual characteristic of the landscape. Sabina outlined expectations that increased noise and vibration levels, as well as changes to air quality, would degrade the experience of the natural environment for subsistence harvesters using the area, as well as affect the distribution and abundance of some species. It was noted that consequently, harvesters tracking caribou would be expected to change their area of activities based on the location of caribou and that changes to the experience of the natural environment by these harvesters would be based on changes to the location of activities, rather than increases to noise and vibrations. Sabina further predicted that although it expected changes to the natural environment to occur at all project stages, subsistence harvesters' experiences of the natural environment would vary depending on the time and location (e.g., during operations, harvesters travelling during the summer months would not be expected to be adversely affected by winter ice road traffic).

Sabina noted that changes to the experience and/or perceptions of the natural environment within the land use LSA during reclamation and closure would likely continue as a result of the continued presence of some workers and buildings. It was further outlined that there would be a minimal amount of disturbance during the post-closure monitoring phase as project equipment and facilities would have been removed and site remediation completed. It was noted that while the experience of the natural environment would be likely to remain affected, it would be limited to visual effects from the remaining infrastructure and ground disturbance.

Sabina predicted with high confidence that the Project would result in negative residual effects to harvesters' experience of the natural environment at the Goose Property and MLA PDAs, would be likely to occur and occur only sporadically (at discrete times during the summer months), and would be not significant, as the predicted geographic extent would be confined to the project footprint or LSA.

Sabina predicted that the expected non-significant residual effects of the Project could act cumulatively within changes to the experience of the natural environment caused by the Lupin, Jericho, George, BIPR, and Hackett River projects. Sabina did not expect cumulative residual effects as a result of the Doris North or Hope Bay Belt (Phase 2). With medium confidence, Sabina predicted that potential project-induced cumulative residual effects to subsistence harvesters resulting from changes to the experience of the natural environment would be negative, likely to occur if projects were developed, and be not significant, as the potential effects were predicted to be sporadic, reversible, and not widespread.

Distribution and Abundance of Resources

Sabina noted that the subsistence economy is reliant on wildlife, bird, fish, and vegetation populations and that predicted changes in distribution and abundance of these populations would cause a change in subsistence harvesting patterns within the LSA. Sabina did not expect that the overall levels of harvesting within the RSA and broader region would be reduced. It was noted that project activities during mobilization and construction and operations, such as air traffic, shipping, vehicle traffic, operation of heavy equipment, and processing of mine ore, resulting in changes to noise, vibration, and air quality levels, could cause changes to the distribution and abundance of resources and could partly be linked to a loss of vegetation within the PDA. The effects of the Project on Inuit harvesting within the land use LSA were predicted to be species dependant, as some species, particularly caribou, were expected to avoid Project infrastructure and activities, while others were expected to maintain their current distribution. Sabina noted expectations that changes to harvesting patterns would reflect changes to the distribution and abundance of wildlife resources.

Sabina noted that changes to the distribution and abundance of resources within the land use LSA during reclamation and closure would likely continue as a result of the continued presence of some workers and buildings and reclamation work activities. It was further noted that changes to the abundance and distribution of wildlife, bird, fish, and vegetation were expected during post-closure monitoring, albeit to a lesser extent than during earlier project phases due to reduced activity and reclaimed landscapes. Sabina predicted that during reclamation and closure and post-closure monitoring, the Goose Property would return to practicable, self-sustaining ecosystems that are compatible with a healthy environment and human activities.

Sabina predicted with high confidence that the Back River Project would result in negative residual effects to the abundance and distribution of resources, which would be likely to occur, and be not significant, as the predicted effect would be reversible within time and limited in geographic extent. Sabina predicted that potential project-induced residual effects on the abundance and distribution of resources would be a result of habitat loss and likely relocation of resources to areas outside the land use LSA.

Sabina predicted that subsistence harvesters could experience species specific cumulative effects related to the abundance and distribution of resources from development of George Gold and Silver, BIPR, Hackett River, and Hope Bay Phase 2, and the Back River projects. With medium confidence, Sabina predicted that effects would be negative and likely to occur if additional projects were to develop, be not significant, and that any changes would not result in overall lower levels of harvesting. Sabina predicted that the Project would not have a residual transboundary effect on subsistence harvesters as a result of changes to the distribution and abundance of resources, specifically the Ahiak and Bathurst caribou herds. Although Sabina expects changes in the distribution of caribou (see Section 4.11: Terrestrial Wildlife and Wildlife Habitat), it did not anticipate a reduction in the caribou population within the RSA. Changes to land use activities of harvesters residing in the North Slave Region that rely on the Bathurst and Ahiak caribou herds were not anticipated.

Mitigation and Monitoring

Sabina proposed an adaptive management approach that focused on optimizing alternatives, incorporating design changes, utilizing management practices to eliminate, minimize, control, or reduce adverse effects, compensating losses (e.g., fisheries offsetting); and undertaking enhancement measures (e.g., undertaking studies of fish in lakes to be dewatered to inform knowledge of the function of lake ecosystems in the project area). Sabina noted that it had incorporated the following elements into the project design of the Back River Project to minimize potential effects to subsistence harvesters through changes in access to land and resources:

- Shipping limited to open-waters and consequently no ice breaking;
- Two-week work rotation and fly-in/fly-out operation to enhance the ability of Project employees to continue to participate in harvesting activities; and
- Employee ban on hunting or fishing at the project sites.

Sabina explained that it would utilize an adaptive management approach to monitor air quality, dust, and other emissions for wildlife and other receptors. Sabina committed to undertaking ongoing communication with local individuals and communities through regular public meetings and meetings with the Cambridge Bay and Kugluktuk community advisory groups. It was further noted that feedback

would be obtained from mine employees, local land users, hunters and trappers organizations, hamlets, and the community advisory groups would be used to inform management practices. Details on specific measures were provided in the Site Water Monitoring and Management, Air Quality Monitoring and Management, Aquatic Effects Management, and Management Wildlife Mitigation and Monitoring plans, available in Volume 10, Parts 7, 17, 19, and 20, respectively, of the FEIS.

Sabina discussed the potential project effects on traditional activity and land use in Volume 3, Section 3 of the FEIS Addendum under FHR-NIRB-5.6(A) – Potential Effects of the Project on Traditional Activity and Land Use. Sabina provided additional information and clarification on how it had worked to address the Board's conclusions in the 2016 Final Hearing Report that there is considerable uncertainty in relation to the potential effects of the Project on traditional activity and land use. Sabina noted that none of the additional information presented in the FEIS Addendum would affect its conclusions with regards to the socio-economic assessment as originally presented within the FEIS.

Within the FEIS Addendum, Sabina outlined how it had collected Traditional Knowledge throughout the Review process, including, accessing the database of the Naonaiyaotit Traditional Knowledge Project (NTKP), working with the Kugluktuk Hunters and Trappers Organization to collect Traditional Knowledge related to the Bernard Harbour Fisheries offset, and reviewing publically available Traditional Knowledge from Northwest Territories Aboriginal groups. Sabina outlined five (5) reports produced and provided within the FEIS, including two (2) reports produced by the Kitikmeot Inuit Association (KIA) focusing on the western Kitikmeot region and the project area, respectively. Sabina stated that the number and types of people interviewed, the consent practices employed, and the research and analytical methods used all met best practices for qualitative and Traditional Knowledge research.

Sabina clarified its previous commitment to jointly implementing a project-specific Inuit Environmental Advisory Committee with the KIA, providing additional information on the Committee within the FEIS Addendum, including a *Draft* Terms of Reference, which outlined the proposed structure and operation of the Committee. Sabina noted that the Terms of Reference would be further finalized through the Inuit Impact Benefit Agreement negotiation process with the KIA (for additional information, see Section 4.11: Terrestrial Wildlife and Wildlife Habitat).

Sabina further discussed within the FEIS Addendum the Board's concerns, as expressed in the 2016 Final Hearing Report, regarding the potential for increased public use of the proposed winter ice road, and clarified that the road would be private-access and closed to non-project traffic. Sabina provided additional mitigation and management actions pertaining to the winter ice road within the updated Wildlife Mitigation and Monitoring Program Plan, as presented in the FEIS Addendum.

During a presentation at the supplemental Final Hearing, Sabina clarified that it had also collected publicly available Traditional Knowledge from a report focusing on the Akaitcho Dene First Nations, the Tlicho, and the North Slave Métis' knowledge of caribou.[871] In addition, Sabina noted that the Traditional Knowledge and Inuit Qaujimajatuqangit shared had informed its overall approach to developing the Project and outlined how some of the Inuit Qaujimajatuqangit values had been incorporated, providing detail on the Bernard Harbour Traditional Knowledge Study conducted in

[871] J. Prno, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 638, lines 5-14.

partnership with the Kugluktuk Hunters and Trappers Organization.[872] Sabina concluded that:

> *There are numerous future commitments Sabina has made regards to this as well, whether it be maintaining that traditional knowledge agreement I mentioned earlier with the Kitikmeot Inuit Association throughout the project's lifespan or the commitment Sabina has made to create an Inuit environmental advisory committee for which a draft terms of reference has already been prepared.*[873]

5.6.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, the Kitikmeot Inuit Association (KIA) commented on discussions between the KIA and Sabina about contradictory statements within the FEIS regarding locations of Aboriginal fishing areas within the local study area.[874] The KIA noted that its concerns were resolved by Sabina's response that although subsistence freshwater and marine fishing has occurred in the past by Inuit in the Project's vicinity, no fishing areas of key importance to Inuit were identified to be potentially affected by the Project and Sabina did not expect any key subsistence fishing areas to be completely lost as a result of the Project's development. During its presentation at the 2016 Final Hearing, the KIA noted that 25 Traditional Knowledge issues, predominantly editorial, in the FEIS were resolved "*with outcomes included in the KIA's final written submission*".[875]

Within its 2016 final written submission, the Government of Nunavut (GN) commented on Sabina's predictions in the FEIS that there would be no residual effects from indirect mortality of wildlife as a result of changes in public access to the proposed winter ice road for the purpose of hunting.[876] The GN noted that it had low confidence in predictions associated with public use of the proposed winter ice road and number of harvesters using the local and regional study areas. Citing statements made within the FEIS and studies conducted in the Northwest Territories, the GN stated that it is reasonable to assume that the Project would have a positive effect on participation in the subsistence economy from there being more individuals able to participate, improved access, greater harvesting efficiency, and increased harvesting range. The GN recommended that rigorous monitoring of public winter ice road usage be undertaken and that the monitoring plans as presented in the FEIS be updated to include the initiation of an enhanced monitoring program to accurately estimate total road usage levels by members of the public, if public use exceeds the threshold of five (5) persons per year. The GN further recommended that Sabina undertake harvest monitoring in nearby communities to asses potential changes in distribution and amount of harvesting conducted if monitoring reveals extensive public use of the winter access road for harvesting purposes. Within its response to the 2016 final written submissions, Sabina specified that the proposed winter ice road would have restricted access and outlined its proposed Human Activity Monitoring Program within the Wildlife Mitigation and Monitoring Program Plan (WMMPP).[877] The proposed program would include the documentation of information including vehicle type, number of individuals, purpose of access, and outcomes of any interactions with

[872] J. Prno, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 640-646, 1-26.
[873] J. Prno, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 642, lines 8-15.
[874] Kitikmeot Inuit Association, 2016 Final Written Submission, March 10, 2016.
[875] J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 631-632, lines 24-26 and 1.
[876] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.
[877] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.

project personnel. During the 2016 Final Hearing, Sabina and the GN jointly submitted the following agreed upon commitment:

> The Proponent commits to updating the WMMP[878] to include the trigger that should the existing incidental observation program record >5 persons per year using the road for harvesting purposes then the Proponent will implement a more direct monitoring program for persons using the ice road and reported as part of the Socio-Economic Monitoring Report to NIRB.[879]

Within the Burnside Hunters and Trappers Organization's (BHTO) 2016 final written submission, the BHTO and the Omingmaktok HTO (OHTO) noted that community members use the area along the proposed shipping route year round to hunt and camp.[880] The BHTO and OHTO expressed concerns regarding the safety of traditional land users and noted that changes in the proposed shipping routes would have impacts on community members' travel routes to and from Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo). The parties recommended that project-related shipping only occur during the ice free months. Within its response to the 2016 final written submissions, Sabina noted commitments had been made to conduct all marine shipping activities during the open water season only and to not undertake any overwintering or ice breaking activities, except in the case of emergency or unforeseen circumstances. During the 2016 Final Hearing, Sabina further noted its commitment to inform the communities of when vessels are anticipated to sail.[881] For discussions on additional commitments made by Sabina to the BHTO during the supplemental Final Hearing with regards to marine transportation through Bathurst Inlet, see Section 6.2: Accidents and Malfunctions Assessment.

Within the parties' respective 2016 final written submissions, the Government of the Northwest Territories (GNWT),[882] the Łutsel K'e Dene First Nations (LKDFN),[883] the North Slave Métis Alliance (NSMA),[884] and Yellowknives Dene First Nations[885] (YKDFN) all commented on potential project-related negative effects to traditional land use and harvesting of caribou, specifically of the Bathurst caribou herd. The GNWT noted that although there is potential for positive economic development opportunities associated with the Project for residents of Nunavut and the Northwest Territories, it is concerned with potential negative impacts to caribou. The GNWT, LKDFN, NSMA, and the YKDFN all reported hunting restrictions and bans for the Bathurst caribou herd and associated impacts to the respective communities and nations. The LKDFN noted that:

> Since 2010, the Government of the Northwest Territories has imposed bans on hunting the Bathurst Caribou for some Indigenous hunters. The ban was put in place to protect the Bathurst Caribou herd from human disturbances, yet new mines within the Bathurst Caribou herd's range are still being considered and approved. Indigenous hunters should not solely bear the costs of the decline in Bathurst Caribou. Łutsel K'e, a community that is highly dependent on caribou for food, cultural, social and spiritual health and wellbeing, is without caribou this year. This is a

[878] Although referred to as the Wildlife Mitigation and Monitoring Plan, this is formally titled The Wildlife Mitigation and Monitoring Program Plan (WMMPP).
[879] Sabina Gold & Silver Corp. and Government of Nunavut, Exhibit 96, NIRB 2016 Final Hearing File No. 12MN036, April 30, 2016, p. 8.
[880] Burnside Hunters and Trappers Organization, 2016 Final Written Submission, March 8, 2016.
[881] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1005-1008.
[882] Government of the Northwest Territories, 2016 Final Written Submission, March 7, 2016.
[883] Łutsel K'e Dene First Nations, 2016 Final Written Submission, March 7, 2016.
[884] North Slave Métis Alliance, 2016 Final Written Submission, March 7, 2016.
[885] Yellowknives Dene First Nations, 2016 Final Written Submission, March 7, 2016.

significant adverse impact from many disturbances, including mines, on the Bathurst Caribou herd and other barren-ground herds.[886]

The LKDFN further highlighted concern that the potential loss of habitat for the Beverly caribou herd from the Project, particularly related to Kingaok (Bathurst Inlet) and Beechy Lake as a nadlock (caribou crossing), could directly impact the herd's ability to migrate south to reach Łutsel K'e hunting area and would likely cause significant adverse impacts "to our constitutionally protected Aboriginal and Treaty rights".[887] The NSMA similarly commented on the Project's potential significant cumulative impacts to the Bathurst caribou herd and the associated consequences of the declining caribou population to Aboriginal rights and wellbeing. The NSMA noted that "at the time when NSMA members and other Aboriginal peoples are enduring total harvest restrictions from Bathurst Caribou, it is unjustifiable to conclude that the Project's impact on reproductive capacity of caribou and loss of habitat is insignificant".[888] Within its response to the 2016 final written submissions, Sabina concluded that the Project would not interact with the Bathurst caribou herd and that there would be no associated potential effects on that herd. Sabina further discussed potential impacts to the Beverley caribou herd associated with the caribou crossings at the southern portion of Bathurst Inlet and the eastern end of Beechey Lake. Sabina reiterated conclusions made in the FEIS that the Project would not have any effects on the nadlocks (crossings) identified in the Regional Study Area and therefore no effects on caribou movement and populations would occur. For additional information and details on related commitments and the updated WMMPP see Section 4.11: Terrestrial Wildlife and Wildlife Habitat.

The YKDFN noted within its 2016 final written submission that "the ongoing decline of the [Bathurst caribou] herd is no less than a state of emergency" and discussed the cultural symbolism of caribou, stating that "caribou tie the YKDFN to their land, their language, their traditional knowledge and their history."[889] The YKDFN further discussed the relationship between the Bathurst caribou herd and food security and noted that the herd is the "single most significant source of country food for the Yellowknives Dene" and that "Elders and traditional land users are disproportionally affected by the collapse of the Bathurst herd and harvesting restrictions".[890] The YKDFN requested that the Proponent be required to provide financial support and/or compensation to the YKDFN for on-the-land monitoring of the Bathurst herd, to pursue solutions to food security, and to take compensatory mitigation to offset the negative effects of the Project on the Bathurst herd. Within its response to the 2016 final written submissions, Sabina referenced the proposed mitigation and monitoring measures to reduce potential project-effects on caribou in the WMMPP and noted that it has committed to contributing to a monitoring program led by the GNWT to monitor the Bathurst caribou herd at a regional scale (see Section 4.11.2: Terrestrial Wildlife and Wildlife Habitat).

Within its 2016 final written submission, the NSMA further commented on the potential for significant impacts from the Project on NSMA members' Aboriginal rights and noted that Sabina has not made any attempts to negotiate an Impact Benefit Agreement with the NSMA. The NSMA concluded that as the Project would potentially adversely and significantly impact the Bathurst Caribou herd, such impacts would directly impact Aboriginal rights, culture, and food sovereignty of NSMA members. Noting that "the failure to negotiate … is a failure to accommodate the NSMA members' Aboriginal rights," the

[886] Łutsel K'e Dene First Nations, 2016 Final Written Submission, March 7, 2016, pp. 6-7.
[887] Łutsel K'e Dene First Nations, 2016 Final Written Submission, March 7, 2016, p. 16.
[888] North Slave Métis Alliance, 2016 Final Written Submission, March 7, 2016.
[889] Yellowknives Dene First Nation, 2016 Final Written Submission, March 7, 2016, p. 3.
[890] Yellowknives Dene First Nation, 2016 Final Written Submission, March 7, 2016, p. 4.

NSMA requested that the NIRB direct the Proponent to enter into an Impact Benefit Agreement with the NSMA prior to the Water Licence application process. Within its response to the 2016 final written submissions, Sabina outlined consultation efforts undertaken with the NSMA associated with the Project and consideration of concerns raised in its assessment of potential environmental and socio-economic effects. Sabina noted that while it is committed to continue engagement with the NSMA it does not agree that the request for an Impact Benefit Agreement is reasonable, given the location of the Project in Nunavut and the legal context of the *Nunavut Agreement*. Sabina further stated that it disagreed with the NSMA's assertion that there would be significant impacts resulting from the Project and reiterated that the conclusions as presented in the FEIS are that the Project would not cause significant adverse environmental or socio-economic effects. During the 2016 Final Hearing, the KIA questioned the YKDFN on the project-related consultation opportunities it has had with Sabina. The YKDFN responded that:

> *the Yellowknives had an opportunity to engage until the process, both with the proponent and the Board, but we stand by our assertion that this, along with other exploration projects, could represent the straw that broke the camel's back, as it were, in terms of the Bathurst herd not being able to sustain any more insults*.[891]

During its presentation the 2016 Final Hearing, the GNWT stated that:

> *The Government of the Northwest Territories concerns itself with all wildlife populations that range between our two jurisdictions; however it is the barren ground caribou herds that are the cultural and spiritual mainstay for several aboriginal groups in the Northwest Territories. The currently vulnerable population status of the Bathurst herd requires that any actions that pose further risk of decline or delayed recovery be very carefully considered.*[892]

Board staff questioned the GNWT on "*current whether harvesting restrictions on the Bathurst herd are known to have led to corresponding increases in harvesting of other caribou herds to compensate either in Nunavut or in the Northwest Territories*".[893] The GNWT responded that while the restrictions on the Bathurst herd have probably increased harvesting pressures in the NWT, primarily to the range of the Bluenose-East herd, it did not have evidence that the herds in Nunavut have been impacted.[894]

The LKDFN further noted during the 2016 Final Hearing that:

> *We're just here to stress our importance of the caribou to our people. We live off it, and right now we're not having any meat - - we have no caribou. This is the first time in my life that I have no caribou meat in my fridge. It is - - so it's very disturbance [sic] for our people for having no caribou. We're struggling right now … The Łutsel K'e Dene First Nation recommends that the NIRB take into consideration the current state of the Bathurst caribou herd and cumulative impacts within the herd's entire range when assisting the significance of habitat loss from the*

[891] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 766-767, lines 22-26 and 1-2.
[892] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 675, lines 13-21.
[893] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 699, lines 14-17.
[894] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 699-701.

project.[895]

Not everybody got jobs like they said they would, and then there's no caribou, and that's the two things they said that won't happen and that has happened.[896]

The NSMA also commented on the potential impacts to caribou harvesting and noted that the:

North Slave Metis Alliance is of the opinion that the Bathurst caribou can no longer sustain meaningful level of harvest, that the cumulative adverse effects on Bathurst caribou is already significant, and therefore, any adverse impact on this herd is significant and adverse. Any residual impact that may be expected in the future when the caribou calving ground or post-calving ground shift will incur a negative adverse -- adverse effect to Aboriginal Bathurst caribou users, that is North Slave Metis Alliance members. Therefore, any residual impact must be offset through progressive reclamation and other means.[897]

During the 2016 Final Hearing the GNWT asked the NSMA to provide "*the history of the North Slave Metis Alliance members and where you harvested caribou and maybe how that has changed as a result of the decline in caribou numbers*".[898] In response, the NSMA discussed the caribou historically harvested by its members east and north of the Great Slave Lake area, which would typically include the Bathurst, Beverly and Ahiak, and Bluenose-East caribou herds. It was noted that due to the hunting ban on the Bathurst herd as well as low numbers, the NSMA have started hunting the Bluenose-East herd more heavily, which generally occurs west of the range of the Bathurst caribou herd and is restricted. The NSMA re-iterated that due to the hunting bans and restrictions its members have not been able to harvest sufficient caribou to meet their needs.[899] In response to the NSMA's presentation and discussion noted above, Sabina discussed engagement opportunities, including public meetings, e-mails, and phone calls, undertaken with the NSMA regarding the Back River Project and committed to ongoing engagement with Aboriginal groups within the Northwest Territories throughout the life of the Project.[900] For specific commitments regarding caribou mitigation and monitoring measures, see Section 4.11.2: Terrestrial Wildlife and Wildlife Habitat.

A Community Representative from Cambridge Bay further commented on declining caribou populations and difficulties Nunavut hunters can face in discerning the specific herd individual caribou are members:

When I go out caribou hunting, I don't ask the caribou, Which herd are you from? So that's a difficulty I face. Some of the caribou herds are larger than the other. The caribou herd that's on Victoria Island are from the Ahiaq herd, and some are from the Ellice area herd. Most of us that go out caribou hunting in the community hunt from the Ahiaq herd. … I tell my fellow hunters it's

[895] B. Sanderson, Łutsel K'e Dene First Nations, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 709, lines 3-20.
[896] B. Sanderson, Łutsel K'e Dene First Nations, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 714, lines 10-12.
[897] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 724, lines 14-26.
[898] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 747, lines 19-23.
[899] S. Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 747-748.
[900] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 750-751.

> *very difficult sometimes that there's three herds that we hunt: Bathurst, Beverly and Ahiaq herds.*[901]

During its presentation at the 2016 Final Hearing, the YKDFN commented on the potential basin opening effect of the Project, if approved and constructed, and resulting potential impacts to caribou herds and traditional land use: "*There will be more mining, more roads, more exploration, and more disruption to caribou*".[902] Following further discussion on the potential for project-related impacts to caribou and traditional culture, the YKDFN concluded that it opposed the Project, noting that "*the threat it poses to their culture, heritage, and way of life are just too great. If the Yellowknives and other Dene are the caribou people, who will they be when the caribou is gone*"?[903]

During the 2016 Final Hearing, Nunavut Community Representatives discussed Inuit use of the land in proximity to the Project for subsistence purposes. An Elder from Cambridge Bay discussed some of the history of Inuit living in proximity to Arctic Sound, just north of the proposed Marine Laydown Area. She discussed the importance of language, culture, and the relationship to the Bathurst caribou herd, noting that:

> *The Bathurst caribou herd has always been migrating in our homeland … This is our history, where we used to walk during the summer up to the caribou range inland where we would hunt the caribou.*[904]

Other discussions during the 2016 Final Hearing of the environment and activities undertaken in proximity to Kingaok (Bathurst Inlet) included:

> *I remember very well, well-used trails in one of our travelling by foot. My dad was carrying me. Well-used trails by caribou migrating*.[905]

> *I've made it to Bathurst in my young life once. It's a beautiful country down there. Pristine land. The water is still clean. The air is still clean. The land is -- a lot of people from other parts of the country say there's nothing up there. There's nothing to see when, in fact, if you sit on the esker, you can spot the little songbirds. You can hear the ducks and the geese. You can spot the odd caribou and muskox off in the distance. You can see the grizzly bears and the wolves and so on within eye view.*[906]

One Community Representative from Kugaaruk discussed the importance of caribou to Inuit culture and suggested that "*perhaps it will be better for the mining companies to open a mine where there is no*

[901] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1272, lines 10-17 and 24-26.
[902] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 756, lines 2-10.
[903] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 759-760, lines 26 and 1-4.
[904] A. Kamuayuk, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 596-597, lines 2-3 and 1-2.
[905] A. Neglak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 924, lines 19-21.
[906] H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1016-1017, lines 18-26 and 1-2.

wildlife and where the Inuit didn't go hunting to that area".[907] In response, Sabina noted that while the location of mining-related activities would necessarily be located where there is a viable mineral deposit, it has made "*every effort to make sure we collect the necessary baseline data before we start and make sure we plan our activities appropriately so that we don't have a significant impact on the wildlife*".[908]

One Community Representative from Cambridge Bay questioned Sabina on its established community advisory groups and how Community Representatives, particularly Elders, would be selected. Sabina noted in response that community groups, such as the hunters and trappers organizations, the hamlet councils, and the heritage societies, were solicited to select representatives to sit on the advisory groups.[909] Community Representatives discussed the importance of being on the land and the associated transmission of culture:

> *I just had comments of Bay Chimo/Bathurst. We had two Elder and youth camps a few years ago, and we - - didn't have one since five years ago. A lot of youth learned from the Elders on hunting, sewing, carving, and butchering. They learned a lot of knowledge, and we are wondering if KIA could help us with funding.*[910]
>
> *The youth and the Elders, they like to be out on the land together, and we have out-on-the-land programs for them. Sometimes I think that sometimes our funding is insufficient to run this program on the land program. Would you have any funding available to help - - help run this program during the spring or even in the summer anywhere that could benefit in this region that could be used to have these two groups of people to be out on the land, on the land and teach each other certain Traditional Knowledge?*[911]

The KIA noted in response to the latter question that there is an Inuit Initiatives Fund available that individuals and groups can apply to. While the KIA stated that it could not discuss specific details regarding the IIBA being negotiated, the Project could indirectly benefit such programs through the availability of financial resources from project-related revenues.[912]

During closing remarks at the 2016 Final Hearing, a Community Representative from Kingaok (Bathurst Inlet) noted:

> *When my presentation was supposed to be presented to everyone here, my intention was to ask for support from you, from the government, from Sabina, or any other company so at least think about what it is that we could do to be successful in our region. I would like to do something such*

[907] M. Anguti, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 836-837, lines 25-26 and 1-2.
[908] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 838, lines 5-8.
[909] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 814, lines 1-12 and pp. 816-818.
[910] E. Kakolak, Omingmaktok (Bay Chimo), NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1102, lines 18-24.
[911] J. Haniliak Sr., Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1098-1099, lines 25-26 and 1-10.
[912] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1099.

as the cultural school. It doesn't have to be all year-round.[913]

In its final written submission on the FEIS Addendum, the Government of Nunavut (GN) noted that it was satisfied with Sabina's commitment that if incidental monitoring should reveal more than five (5) groups of people using the winter ice road in a calendar year, it would implement enhanced management measures to further limit the use of the road. However, the GN maintained its concern that there was uncertainty regarding the extent to which the proposed winter ice road would be used as an access corridor for wildlife harvesting. The GN recommended that if monitoring results reveal extensive use, or a trend of increasing use, of the winter ice road for harvesting purposes, a monitoring study should be undertaken in nearby communities to assess potential changes in distribution and amount of harvesting occurring as a result of the road. Within its response to final written submissions on the FEIS Addendum, Sabina noted its agreement with the GN's recommendation and updated its Wildlife Mitigation and Monitoring Program Plan to include reference to a harvest study in nearby communities if extensive or increasing use of the winter ice road was identified.

During the supplemental Final Hearing, Sabina responded to the Burnside Hunters and Trappers Association's (BHTO) final written submission on the FEIS Addendum with regards to concerns of potential project-induced impacts to wildlife, specifically the Bathurst caribou herd. Sabina noted its use of scientific and community knowledge within its impact assessment process and discussed its revised Wildlife Mitigation and Monitoring Program Plan.[914] For additional information on proposed mitigation and monitoring measures for caribou, see Section 4.11: Terrestrial Wildlife and Wildlife Habitat.

In response to Sabina's description during the supplemental Final Hearing of its use of traditional place names presented within the two (2) reports published by the KIA, the BHTO and Community Representatives questioned the terminology used and provided alternate spellings of place names with regards to the Project and study areas and asked for clarification on the location of proposed project components.[915] During a subsequent presentation, Sabina described where the proposed locations would be and noted that while place names can differ "*we've chosen to respect the original Kitikmeot Elders that provided those place names to the Kitikmeot Inuit Association by using those same spellings and names that were provided.*"[916,917]

During its presentation at the supplemental Final Hearing, the BHTO and community representatives discussed the history and traditional activities of community members related to the proposed Project area, including

[913] Connie Kapolak, Bathurst Inlet, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1349, lines 19-25.
[914] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 95, lines 1-26.
[915] See for example: C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 124-125, lines 23-26 and 1-25; P. Akkikungnaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 678, lines 6-20; M. Aglukkaq, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 814, lines 19-26.
[916] J. Prno, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 640, lines 15-18.
[917] J. Prno, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 815-816, lines 1-26 and 1-10.

…taking nature with respect either for your traditional foods on just for "nature view" is a calming way of life for Inuit, and we have done this for many years. Take all that you need and save the rest for others.[918]

…all the people, we obviously need food, sea meat or caribou, fish, anything - - anything that our native people would like to eat every day. They could eat that.[919]

…I used is to live near Back River when I was growing up. I always think about -- thinking about my family in the past. The Elders walking, walking in the Back River, how my parents was -- I'm - - along the Back River, there are many -- many places where we used to camp.[920]

During the supplemental Final Hearing, a Community Representative from Omingmaktok (Bay Chimo) commented on a map presented by Sabina on Traditional Knowledge and noted that it was unclear whether the boundary reflected areas that are currently being used by community members.[921] In response, Sabina clarified that the purpose of the map was to display the information collected in the study area rather than the results and noted that the land use report with information regarding Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), Kugluktuk, and Cambridge Bay could be found in the FEIS.[922]

In response to questions raised by community representatives related to the types of Traditional Knowledge studies undertaken, Sabina outlined the Traditional Knowledge workshops the Proponent undertook in Kugluktuk and Cambridge Bay, with representation from Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) to inform the FEIS. Sabina stated that while it would not repeat the workshops previously undertaken, any traditional knowledge shared during meetings would be recorded and utilized in ongoing work.[923,924]

A Community Representative from Taloyoak noted during the supplemental Final Hearing their approval of the proposed Back River Project as well as Sabina's approach in collecting and using Traditional Knowledge

I am very pleased with the way our culture and heritage is included and traditional knowledge is included in your -- in your plans. I am very pleased to attend this hearing. I am also in support to seeing Sabina open a mine in this region. We can't only live off our traditional ways. We have to

[918] P. Kapolak, Omingmaktok (Bay Chimo), NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 598, lines 9-13.
[919] P. Akkikungnaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 678, lines 21-24.
[920] S. Qitsualik, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 681, lines 18-23.
[921] B. Klengenberg, Omingmaktok (Bay Chimo), NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 659-660, lines 1-6, 21-25, and 15-19.
[922] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 659-661, lines 1-26, 1-26, and 1-24.
[923] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 662-663, lines 25-26 and 1-24.
[924] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 713-714, lines 1-26 and 1-6.

live so that there's a balance between old and new culture. We will continue our traditional ways and pass them on to our next generations.[925]

A Community Representative from Kugaaruk similarly commented to the KIA on the amount of knowledge that Elders hold and importance that their knowledge is used. In response, the KIA noted that it utilizes the Elders and community beneficiary committees to assist in its Traditional Knowledge studies, which are ongoing and accessible to the public.[926]

A community member from Cambridge Bay noted concerns that the Project could result in changes to traditional activities being undertaken and recommended that Nunavummiut look to create employment opportunities without mining:[927]

> *Hunting caribou has always been a birth right, and it is soon fading quickly with mines coming in and destroying the very land our ancestors survived and thrived upon, the very animals that have allowed the Inuit and other indigenous people to survive on. Without our ancestors, the people, this -- without this land, we would not be existent*[928]*.*
>
> *We need to find other ways in which we can create jobs that don't require the nuna to be torn apart and extract its natural resources. We need to come together without mines, without non-Nunavummiut, and come together to put our smart brains to use and really dig down deep to our ancestral routes and knowledge to see how we as Inuit can create jobs for ourselves*[929]*.*

Within its response, Sabina discussed its effects assessment and emphasis on Inuit employment, work it conducted to address the Board's concerns as expressed in the 2016 Final Hearing Report, and stated that *"in the end, it will be up to them to decide what they – what they recommend."*[930] Sabina further noted the surety bond it would provide to ensure proper clean-up measures are taken.[931]

NIRB staff asked Sabina to clarify whether any community members had expressed concerns on development in an area considered traditional homeland. Sabina noted in response that there were concerns expressed with regards to development at the Marine Laydown Area (MLA), and stated that it had "*worked diligently with Bathurst Inlet and Bay Chimo to try to make sure that we've, you know, addressed as many concerns and brought them in as close into the planning as possible*".[932] Sabina

[925] S. Oleekatalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 698-699, lines 21-26 and 1-3.
[926] P. Emingak, Kitikmeot Inuit Association, supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 868-869, lines 18-26 and 1-25.
[927] J. Angulalik, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 778-784.
[928] J. Angulalik, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 777-778, lines 24-26 and 1-5.
[929] J. Angulalik, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 780, lines 7-14.
[930] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 786, lines 2-3.
[931] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 786, lines 12-20.
[932] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 126, lines 11-15.

clarified that concerns were predominantly focused on the MLA rather than the Goose site due to the proximity to Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo).[933]

During closing remarks at the supplemental Final Hearing by community representatives of Cambridge Bay, it was noted that:

> *Before in 2016, it was very technical. Plain language is very good, more understanding. They do support your project with the intent that you guys use our guides, our senior guides, our traditional knowledge guides once you guys start doing your -- your monitoring. That's -- that's all I have to say, is that the HTO board does support your project.*[934]

5.6.3 Views of the Board

In response to questions raised by the Board during the 2016 Final Hearing, the Kitikmeot Inuit Association (KIA) elaborated on the Traditional Knowledge Report[935] referenced by Sabina in its FEIS and outlined the Naonaiyaotit Traditional Knowledge Project.[936] The Board asked for additional clarification on whether all communities in the Kitikmeot region participated in providing Traditional Knowledge for the study. The KIA clarified in response that Inuit were selected to participate in the study based on their familiarity with the land and that there was not equal representation from all of the Kitikmeot communities.[937]

The Board further questioned the KIA on whether the KIA and Sabina had considered creating Traditional Knowledge programs in the proposed project area throughout the mine's life to assist in the preservation and promotion of Traditional Knowledge of the region. In response, the KIA discussed past partnerships with proponents, noting that the KIA would likely require an Inuit environmental advisory committee to be established to monitor the Project; a key component of this would be to provide Traditional Knowledge to Sabina to better manage the Project.[938] During the supplemental Final Hearing, the Board heard a similar question raised by a Community Representatives of Omingmaktok (Bay Chimo) on whether Traditional Knowledge would continue to be collected throughout the life of the project: "*Throughout the year, how many workshops do you have coming into the communities for members to be able to participate"*.[939] While the Board acknowledges and appreciates the Traditional Knowledge studies undertaken to date and used to inform the Back River Project and associated assessment, it is important to note the importance of continuing to utilize Inuit Qaujimaningit

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[933] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 126-127, lines 14-26 and 1-16.

[934] B. Maksagak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1021, lines 14-21.

[935] Kitikmeot Inuit Association. (2012). Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP). Prepared for Sabina Gold & Silver Corp. by Kitikmeot Inuit Association: Kugluktuk, NU.

[936] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 666-667.

[937] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 668-669, lines 21-26 and 1-10.

[938] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1086, lines, 7-25.

[939] C. Klengenberg, Omingmaktok (Bay Chimo), NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 663, lines 2-5.

throughout the life of the Project and emphasizes its expectations that Inuit Qaujimaningit would continue to be collected to inform ongoing monitoring efforts. For additional discussion related to Traditional Knowledge and the consideration of Inuit Qaujimajatuqangit in the wildlife assessment and ongoing monitoring of this Project (e.g., use of Inuit wildlife monitors) see Section 4.11: Terrestrial Wildlife and Wildlife Habitat.

During the supplemental Final Hearing, the Board asked Sabina to clarify the appointment process for the proposed Inuit Environmental Advisory Committee as well as the newly proposed Caribou Technical Advisory Group. Sabina responded that the establishment of both committees was included within the Inuit Impact and Benefit Agreement (IIBA) currently being negotiated between Sabina and the Kitikmeot Inuit Association (KIA). Sabina explained that the focus of the Caribou Technical Advisory Group would be to monitor the activities and effectiveness of the environmental monitoring program specific to caribou. Sabina anticipated that the committee would be comprised of representatives from Sabina, the KIA, the Government of Nunavut (GN), and the Government of the Northwest Territories and would extend for the duration of the life of the mine.[940] In a deferred response, Sabina read out the appointment process for the Inuit Environmental Advisory Committee as stated within the *Draft* Terms of Reference included in the FEIS Addendum. It was specified that committee members would be determined by the IIBA Implementation Committee, jointly formed by the KIA and Sabina.[941] For additional information on the Environmental Advisory and Caribou Technical Advisory committees, see Section 4.11: Terrestrial Wildlife and Wildlife Habitat. When the Board asked if committee members would receive financial remuneration for their role, Sabina noted that while these positions would not be full-time, committee members would be financially compensated for their roles.[942] The Board acknowledges the additional information presented by Sabina in the FEIS Addendum and the supplemental Final Hearing on development of a project-specific Inuit Environmental and Caribou Technical advisory committees and how these tools might assist in better-managing the Project if it were to move forward.

In response to a follow-up question by the Board during the 2016 Final Hearing on the Traditional Knowledge collected for the studies discussed, the KIA clarified that the regional Traditional Knowledge Study was comprised of Knowledge provided by Inuit from the western Kitikmeot region, including 50 Elders, with experience on the land or in communities associated with Kugluktuk, Cambridge Bay, Omingmaktok (Bay Chimo), Kingaok (Bathurst Inlet), or Contwoyto Lake. It was stated that Inuit with "*either historic ties to the areas, who were active harvesters in the areas, [or] who consider that area their homeland*" were selected for the site-specific study related to the Project and were not only from Cambridge Bay.[943] The KIA further noted that it is in the process of undertaking Traditional Knowledge studies in the eastern Kitikmeot communities of Kugaaruk, Taloyoak, and Gjoa Haven.[944]

During the supplemental Final Hearing, the Board further discussed Traditional Knowledge and

[940] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 81-82, lines 1-26 and 1-26.
[941] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 86-88, lines 12-26, 1-26, and 1-5.
[942] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017 pp. 134-135, lines 7-26 and 1-8.
[943] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1092, lines 14-23.
[944] S. Anablak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1091-1093.

commented on the Traditional Knowledge agreement between Sabina and the KIA and asked for clarification on what understanding of Traditional Knowledge and Inuit Qaujimajatuqangit was used and what gaps were identified within the Traditional Knowledge studies. Within its response, Sabina described the Traditional Knowledge agreement, including the selection process for knowledge holders, and noted that because the original Naonaiyaotit Traditional Knowledge Report was conducted at a regional scale, the knowledge shared was not specific to the Bathurst Inlet area or the proposed Back River Project area. It was noted that as a result, the subsequent report was written based on Traditional Knowledge workshops held with a focus on the project area.[945] The Board specifically noted its appreciation that Sabina was both utilizing the knowledge shared by people and Elders who use the land and "*bridging that big, large gap between Traditional Knowledge from a scientific point of view … from Inuit societal value beliefs that we have".*[946] The Board further expressed its appreciation with the approach Sabina took in collecting and using Traditional Knowledge and Inuit Qaujimajatuqangit. It was noted that "*I would like to compliment Sabina as well in their efforts to include Traditional Knowledge and Inuit Qaujimajatuqanjit* [sic Qaujimajatuqangit]*, and that is a first for any company to include those two".*[947]

The Board heard concerns expressed by multiple Community Representatives during the supplemental Final Hearing that some of the Traditional Knowledge presented during Sabina's presentations was not reflective of the knowledge they were familiar with. During the 2016 Final Hearing Report, the Board expressed concerns that the Traditional Knowledge collected and used to inform the studies Sabina used within its effects assessment may not have adequately represented all land users in the Kitikmeot region. However, the Board acknowledges the clarity provided by Sabina on how its Traditional Knowledge studies were conducted and appreciates the company's respect of the knowledge holders whose knowledge shared was used to inform the company's assessment.

The Board notes the Government of Nunavut's (GN) concerns, expressed during the 2016 Final Hearing and within its final written submission on the FEIS Addendum regarding the Proponent's predictions associated with the public use of the proposed winter ice road. The Board further heard, and shares, concerns expressed by Community Representatives during the 2016 Final Hearing that hunting in the project area could increase should increased access occur, which could lead to adverse impacts to wildlife, specifically caribou. The Board acknowledges Sabina's updated Wildlife Mitigation and Monitoring Program Plan that incorporated previous recommendations on monitoring triggers, as well as a new commitment made during the supplemental Final Hearing with regards to monitoring public usage of the proposed winter ice road.

The Board further heard multiple concerns from Intervenors and Community Representatives during both the 2016 and supplemental Final Hearings that potential project effects to caribou, particularly the Bathurst herd, would further impact already existing food security issues associated with caribou herds, particularly in the Northwest Territories. The Board shares the concern that additional effects on already stressed and declining caribou populations cannot be sustained. Reflecting this high level of concern, the Board has adopted a very stringent and cautious approach to monitoring for, and

[945] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 127-133.
[946] A. Maghagak, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 133, lines 9-12.
[947] G. Alikut, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 135, lines 14-17.

adaptively managing the potential for these effects as outlined in Section 4.11.4: Terrestrial Wildlife and Wildlife Habitat.

During the supplemental Final Hearing the Board asked Sabina whether Inuit, for example members of the hunters and trappers organizations, could be used as on-site wildlife monitors. Sabina responded that it had previously committed to utilizing Inuit or Indigenous members from Nunavut and the Northwest Territories as wildlife monitors for the life of the Project, and noted that discussions have begun with local organizations, including the Cambridge Bay Hunters and Trappers Organization, on providing wildlife monitors.[948] For additional information, see Section 4.11: Terrestrial Wildlife and Wildlife Habitat.

The Board further asked Sabina whether there would be a project-specific socio-economic committee that youth could be involved in. Sabina responded there would be a project specific socio-economic monitoring committee and that the Proponent had collaborated with the GN to meet their socio-economic expectations and that Sabina further intends to participate in the Kitikmeot Socio-Economic Monitoring Committee. Sabina further noted that it ensures youth representation on its advisory groups in Cambridge Bay and Kugluktuk. As part of its response, Sabina also discussed the potential to involve established community groups, such as the Cambridge Bay Youth Advisory Committee.[949]

5.6.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the initial Review of the Project and as outlined above, the Board had concluded within the 2016 Final Hearing Report that there was considerable uncertainty in relation to the potential effects of the Project on traditional activity and land use. Following a review of the new material presented by Sabina in the FEIS Addendum and the supplemental Final Hearing, as well as the updated views of Parties, the Board believes that the Project's potential effects related to traditional activity and harvesting could be appropriately managed through the commitments provided by the Proponent and application of key mitigation measures.

Recognizing that Sabina has been working with the Kitikmeot Inuit Association (KIA) to collect and incorporate Inuit Traditional Knowledge from land users in the project area, the Board encourages the Proponent to involve Elders and community members in the development and revision of its monitoring and mitigative plans, and urges the parties to ensure that this consultation is ongoing and consistent. On this basis, the Board recommends (the following summaries of the Board's recommended terms and conditions are provided for ease of reference, the full text of the terms and conditions is provided in Section 8: Recommended Project Specific Terms and Conditions):

- The Proponent is strongly encouraged to ensure that the development of all project monitoring plans and associated reporting and updates are undertaken with active engagement of Kitikmeot communities, land users, and harvesters. The Proponent should work with the Kitikmeot Inuit Association and the Kitikmeot Socio-Economic Monitoring Committee to report on the collection and integration of Inuit Qaujimaningit and Traditional Knowledge through its monitoring programs for the Project.

[948] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 135-137, lines 13-22, 13-26, and 1-6.
[949] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 83-84, lines 10-26 and 1-25.

With regards to the potential for the KIA to establish an Inuit Environmental Advisory Committee, the Board recommends the following:

- Requiring the establishment and annual reporting on the results of an Inuit Environmental Advisory Committee.

The Board heard multiple concerns that the Project could result in negative transboundary socio-economic impacts, specifically with regards to food security from potential negative project effects to caribou herds, specifically the Bathurst herd. In addition to the terms and conditions recommended by the Board to address the potential for impacts to caribou under Section 4.11.4: Terrestrial Wildlife and Wildlife Habitat, the Board recommends the adoption of the Proponent's commitments made during the project Review to cooperate with various agencies and to monitor public usage of the proposed winter ice road for potential effects on harvesting. On this basis, the Board recommends the following:

- Requiring a harvest study to be conducted if the results from monitoring reveal extensive public use of the winter ice road, or a trend of increasing use of the winter ice road for harvesting

5.7 NON-TRADITIONAL LAND USE AND RESOURCE USE

5.7.1 Views of the Proponent

Sabina discussed its assessment and proposed mitigation and monitoring measures with regards to non-traditional land and resource use in Volume 8, Sections 4 of its FEIS. Within Volume 8, Sections 4.5 to 4.9, Sabina concluded that the Back River Gold Mine Project (Back River Project or the Project) would result in negative residual and cumulative effects to 'experience of the natural environment' for non-traditional land users.

Sabina used the following two (2) spatial assessment boundaries to define land use for its effects assessment on non-traditional land and resource use:

- Local Study Area (LSA) – The LSA encompasses an area of 226,042 hectares (ha) and is comprised of the project development areas (PDA) at the Goose Property, Marine Laydown Area (MLA), and proposed winter ice road corridors. The LSA extends to areas immediately surrounding project infrastructure.
- Regional Study Area (RSA) – The RSA encompasses an area of 2,115,813 ha and was defined as the area of land and water encompassing the Back River Project and consistent with the largest boundary of wildlife, regional marine, and terrestrial study areas.

Non-traditional land and resource users were identified as those engaged in the tourism industry – including lodge owners, wilderness guides, and their clients – and did not include uses associated with mining exploration and development. The potential for project effects on current land use activities related to non-traditional land and resource use was assessed through potential changes to: access to land and resources, experience of the natural environment, and abundance and distribution of resources.

Access to Land and Resources

Sabina identified two (2) lodges operating within the RSA: the Elu Inlet Lodge and the Bathurst Inlet Lodge, operating within areas approximately 335 and 165 kilometres (km) from the Goose Property,

respectively. Associated activities undertaken within the RSA were noted to include sport hunting, fishing, wildlife viewing, hiking, kayaking, and canoeing. Sabina predicted that the Project could reduce the amount of land available for these purposes and displace access to resources (e.g., waterbodies, fish, and plants) at specific locations in the LSA, and particularly at the Goose Property and MLA PDAs. Sabina concluded that while the development of the Project could result in a reduction of the total amount of areas available for use by non-traditional land users, the Project would not cause changes in access to land and resources at known areas of use by the two (2) lodges, in particular Fishing Creek or Bathurst Lake. It was noted that the Project's proposed MLA would be located approximately four (4) km east of Fishing Creek. Sabina further noted that the terrain and resources used by lodge owners and their clients within the LSA were not unique or exclusive, and consequently did not assess this potential effect further.

Experience of the Natural Environment

Sabina predicted that project-induced changes to the experience of the natural environment, particularly in the vicinity of the Fishing Creek area, would potentially result in negative residual effects, which would be most notable during the mobilization and construction phases. Sabina projected that while individuals associated with the Bathurst Inlet Lodge could observe increases to air and marine traffic, changes to air quality, noise, and vibration would be negligible at the MLA as a result of minimal levels of project activities (e.g., no blasting, drilling, or processing, and minimal winter ice road traffic, equipment use, and shipping activities expected). Sabina noted that it did not expect the winter ice road to cause changes to the experience of the natural environment for non-traditional land users due to a lack of presence by these users during the months of road operation. It was further projected that if the Project resulted in a reduction in the presence of wildlife in proximity to Fishing Creek, non-traditional land users could experience some degradation to their ability to participate in wildlife viewing at this location, and consequently their experience of the natural environment. However, Sabina qualified this by stating that wildlife viewing, particularly of species with large ranges, cannot be guaranteed, even without the presence of the Project.

It was further predicted that the primary disturbance to non-traditional land users at the MLA would be visual and that as a result, lodge owners and guides could choose to minimize their use of the Fishing Creek area or may alternately visit various other locations that provide a similar wilderness experience. However, Sabina noted its expectations that clients would continue to frequent the Bathurst Inlet Lodge. Changes to the experience of the natural environment of land users associated with lodge operations at Fishing Creek as a result of the MLA were expected to continue during reclamation and closure while project facilities remain in place. Sabina predicted with high confidence that the Project would result in negative residual effects to non-traditional land users' experience of the natural environment at the MLA PDA and in the vicinity of Fishing Creek, would be likely to occur, and would be not significant, as the predicted geographic extent would be confined to the project footprint or LSA. It was further predicted that during the post-closure monitoring phase the area would be reopened for use and, following the removal of project infrastructure and remediation, project effects to the experience of the natural environment would be largely cease.

Sabina further predicted that the potential development of George Gold and Silver Mine, Bathurst Inlet Port and Road, and Hackett River Base Metals Mine projects, in addition to the Back River Project, could result in adverse negative effects to the experience of the natural environment for individuals associated with the Bathurst Inlet Lodge. It was noted that potential effects would be limited to activities associated with ports on the Bathurst Inlet, roads linking the projects to Bathurst Inlet, and increases to shipping activities. With medium confidence Sabina predicted that potential project-

induced cumulative residual effects to non-traditional land users resulting from changes to the experience of the natural environment would be negative, likely to occur if additional projects are developed, and be not significant, as the potential effects were predicted to be sporadic, reversible, and not widespread.

Abundance and Distribution of Resources

Sabina discussed the potential for project-induced changes to the abundance and distribution of wildlife and fish resources at the Goose Property and MLA as a result of changes to air quality, noise, and vibration levels from activities. It was noted that as non-traditional land use would not interact with the Goose Property, potential associated effects regarding the Goose Property would not be assessed further.

Sabina predicted that the Project could cause changes to the abundance and distribution of resources located proximally to the MLA as a result of: loss of terrestrial and marine habitat; the presence of workers and land-based activities; and the addition of air and ship traffic at the MLA. It was noted that although loss of habitat and vegetative ecosystems would be unavoidable within the PDA at the Goose Property and MLA if the Project were to develop, non-traditional land users associated with the Bathurst Inlet Lodge do not participate in hunting or harvesting activities within the MLA and that land use at Fishing Creek is focused on fishing and wildlife viewing. Although Sabina did not expect the Project to result in changes to fishing opportunities at Fishing Creek, as a result of predicted project-related effects on water and sediment quality and fish habitat, it noted the possibility for project effects, such as changes to population abundance, to occur on members of the marine fish community that travel or migrate between the marine environment and freshwater waterbodies. Sabina noted that the potential residual negative effect on Arctic Char resulting from shipping noise was predicted to be not significant after consideration of mitigation (for more information see Section 4.14: Marine Wildlife). Sabina further explained that although there is potential for the development of the MLA to result in changes to fish resources available at Fishing Creek that are important to non-traditional land users, it is expected that potential changes would be minimal and that fishing opportunities at Fishing Creek would not be impacted. Sabina concluded that changes to the abundance and distribution of resources would not affect non-traditional land use within the land use LSA and, consequently, did not assess this effect further.

Mitigation and Monitoring

To mitigate potential effects resulting from project-related sensory disturbances, Sabina proposed to undertake an adaptive management approach and proposed multiple mitigation and monitoring measures. Sabina proposed an adaptive management approach that focused on optimizing alternatives, incorporating design changes; utilizing management practices to eliminate, minimize, control, or reduce adverse effects; compensating losses (e.g., fisheries offsetting), and undertaking enhancement measures (e.g., undertaking studies of fish in lakes to be dewatered to inform knowledge of the function of lake ecosystems in the project area). Sabina noted that it had incorporated the following best management practices for non-traditional land and resource use:

- Communication of shipping schedules and routing; and
- Ensuring vessel travel takes place on routes as planned, to minimize an interaction with existing non-traditional land and resource uses.

Sabina explained that it would utilize an adaptive management approach to monitor air quality, dust, and other emissions for wildlife and other receptors. Sabina committed to undertaking ongoing

communication with local individuals and communities through regular public meetings and meetings with the Cambridge Bay and Kugluktuk community advisory groups. It was further noted that feedback would be obtained from mine employees, local land users, hunters and trappers organizations, hamlets, and that community advisory groups would be used to inform management practices. Details on specific measures were provided in the Site Water Monitoring and Management, Air Quality Monitoring and Management, Aquatic Effects Management, and Wildlife Management Mitigation and Monitoring plans, available in Volume 10, Parts 7, 17, 19, and 20, respectively, of the FEIS.

No new information on non-traditional land use was provided in the FEIS Addendum.

5.7.2 Views and Concerns of Interested Parties

While comments were raised by the Burnside Hunters and Trappers Organization and a Community Representative from Łutsel K'e about the importance of the Bathurst Inlet Lodge, [950,951] during the review of this project proposal no party raised concerns regarding the potential for project-induced effects on non-traditional land use and resource use.

5.7.3 Views of the Board

The Board notes that parties did not raise any concerns with respect to the potential for effects on non-traditional land use and resource use attributed to the Back River Gold Mine Project during the review of this proposal, including at the 2016 Final Hearing or the supplemental Final Hearing. The Board further acknowledges Sabina's proposed plans to mitigate and monitor potential effects to non-traditional land and resource use. However, the Board still finds a lack of information regarding plans to monitor impacts to the experience of the natural environment for non-traditional land users.

5.7.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to non-traditional land use and resource use could be appropriately managed through the commitments provided by the Proponent and application of key mitigation measures associated with engagement with potentially-impacted businesses and organizations.

The Board recognizes the mitigation and monitoring measures that have been proposed by the Proponent to address potential project effects to non-traditional land use and resource use, specifically with regards to undertaking ongoing communication with local individuals and communities. The Board encourages the Proponent to consult with outfitting and guiding businesses that operate in the regional study area regarding their planned use of the land and marine areas in proximity to project infrastructure or activities and any noted project effects, particularly for effects in relation to the experience of the natural environment. On this basis, the Board recommends (the following summaries of the Board's recommended terms and conditions are provided for ease of reference, the full text of

[950] A. Enzo, Łutsel K'e, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1339-1340.

[951] Connie Kapolak, Burnside Hunters and Trappers Organization, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1342-1349.

the terms and conditions is provided in Section 8: Recommended Project Specific Terms and Conditions):

- The Proponent is encouraged to consult with outfitting and guiding businesses that operate in the regional study area regarding use of the land and marine areas in proximity to project infrastructure or activities and any noted project effects, particularly for effects in relation to the experience of the natural environment.

5.8 HERITAGE RESOURCES

5.8.1 Views of the Proponent

Sabina discussed its assessment and proposed mitigation and benefit enhancement measures with regards to archaeology and paleontology in Volume 8, Section 1 and 2 of its FEIS, respectively. Within Volume 8, Sections 1.5.3 to 1.6, Sabina concluded that the Back River Gold Mine Project (Back River Project or the Project) would result in overall negative residual effects to archaeological sites and that through mitigation measures potential effects would be not significant. Sabina concluded that the Project would not result in cumulative or transboundary effects to the VSEC of archaeological sites. Furthermore, through information and knowledge gathered during public consultations, the Kitikmeot Inuit Association Traditional Knowledge report for the Back River Gold Mine Project,[952] consultation with regulatory agencies, and regulatory considerations, Sabina classified paleontological sites as a subject of note. Using results from its paleontological study conducted in the northeastern corner of the Slave Structural Province in Nunavut and at the Potential Development Areas (PDA), Sabina concluded that there are no known paleontological sites protected by legislation that may be affected by the Project. Consequently, Sabina removed paleontological effects from the scope of this aspect of the impact assessment.

Sabina defined the Local Study Area (LSA) for its analysis of archaeological sites as the proposed project footprint with a five (5) kilometre (km) buffer. Sabina identified the same Regional Study Area (RSA) for its assessment on archaeological sites as it did for its baseline studies for wildlife, soils, terrain, and ecosystems and vegetation mapping (see Section 4.4: Terrestrial Environment). Sabina noted that for its impacts assessment on the Archaeology VSEC it assumed that the entire area considered as a PDA for the Goose Property and Marine Laydown Area (MLA) would be disturbed. The temporal boundary for the effects assessment encompassed both the construction and operations project phases. Sabina projected that all potential disturbances to archaeological sites would be mitigated prior to or during construction and operations, and did not predict any additional effects to occur during the reclamation and closure or post-closure monitoring phases.

Sabina used a literature review (which incorporated Inuit Traditional Knowledge), archaeological site information provided by the Government of Nunavut – Department of Culture and Heritage (GN-DCH), and proponent-led archaeological impact assessments to conduct archaeological and paleontological baseline studies. The baseline program included potential infrastructure and known deposits at the Goose and George Properties, the MLA, and along the proposed access roads. Additional baseline data was provided within the following appendices: V8-1A: Archaeological Sites within the LSA and TCWR

[952] Kitikmeot Inuit Association. (2012). Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP). Prepared for Sabina Gold & Silver Corp. by Kitikmeot Inuit Association: Kugluktuk, NU.

Winter Road Connector Assessment Area; V8-1B: Back River Project – Cumulative Heritage Baseline Report 2013; and V8-1C: Archaeological Site Type and Artifact Tables.

Sabina reported that the known archaeological sites within the RSA and LSA were predominantly campsites, resource gathering sites, lithic workshops, and lithic reduction sites, with four (4) burial sites identified within the RSA. Sabina stated that project activities could result in the irreversible alteration of archaeological sites and identified the following impact predictions and proposed mitigation measures for 65 archaeological sites within 1,000 metres (m) of PDAs:

- High risk of direct impacts to the 21 archaeological sites located 0 to 50 m from the PDAs or the proposed roads from the following construction activities: clearing, grading, excavating, earth moving, blasting, and/or tailing and waste rock deposition. Of the identified and known sites, four (4) were discovered within the Goose Property PDA; 15 within the MLA; and two (2) within 50 m of the proposed winter ice roads. Sabina noted that if avoidance of archaeological sites, as the recommended mitigation measure, was not possible, additional measures would be determined through consultation with the GN-DCH prior to construction activities and any impact of the specific site. Potential additional mitigation measures included: detailed site mapping, photography, and controlled subsurface excavations of evaluative units if subsurface deposits are present.
- Moderate risk of indirect impacts from increased human presence to the five (5) archaeological sites located 50 to 150 m from the PDAs or the proposed roads. Through conversation with the GN-DCH, all but one of the sites would be marked as a "No Work Zone". Sabina noted that this site had been mitigated and no further work was determined to be required.
- Low risk of indirect impacts from increased human presence to the 39 archaeological sites 150 to 1,000 m from the PDAs or the proposed roads. Sabina noted that except for two (2) sites where it determined that no further work was required, these sites would be marked as "No Work Zones" and periodic monitoring and inspection would be undertaken.
- No impact to the 241 archaeological sites located within the RSA and more than 1,000 m from the project footprint.

Sabina noted that it had incorporated project design, best management practices, and adaptive management processes into its proposed mitigation and monitoring measures. It was stated that the placement of site infrastructure and the use of temporary winter ice roads were designed to avoid archaeological sites and reduce potential disturbance to the tundra, and consequently reduce potential direct impacts to associated archaeological sites. Sabina noted that it would utilize the best management practice of avoidance and had developed an Archaeological Chance Find Procedure, a component of its Cultural and Heritage Resources Protection Plan, to identify and avoid sites not previously identified. Sabina further detailed proposed monitoring of archaeological sites within its Cultural and Heritage Resources Protection Plan, available in Volume 10, Part 27.

Sabina predicted with high confidence and likely probability of occurrence that potential impacts to known archaeological sites would be negative, of low magnitude, confined to a local geographic extent, and not significant. Sabina further predicted that the duration, frequency, and reversibility of the effect would be long, impacted once, and irreversible, as once the site has been mitigated there would be no additional project-induced effects to the site and it could not be rebuilt or reconstituted. Lastly, Sabina concluded that the resilience of the population would be neutral, as proposed mitigation measures and the resulting recovery of scientific data were considered to offset any potential site disturbance. Sabina

made the same predictions with regards to the level of significance for potential impacts to unknown archaeological sites; however, Sabina's confidence level that there was a low probability of any disturbance to significant unknown archaeological sites was rated as moderate.

Sabina discussed the potential for additional projects and other human land use within the Kitikmeot region to disturb or destroy additional archaeological sites. Sabina noted that the predicted impacts to archaeological sites by the Project would constitute a spatially localized event and would not result in a negative effect on the condition of other archaeological sites in the region. Furthermore, Sabina discussed the legal requirements within Nunavut, and noted its assumptions that residual effects from other projects in the area would also be reduced to not significant through appropriate mitigation measures. Sabina concluded that there would be no cumulative effects as the significance of predicted residual effects would be reduced to not significant through mitigation measures designed through consultation with the GN-DCH.

No new information on heritage resources was provided in the FEIS Addendum.

5.8.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, the Government of Nunavut (GN) commented on Sabina's commitment within the FEIS that it would provide the GN with status updates of all known archaeological sites within 80 metres of the Project and associated maps by March 31st of each year.[953] The GN requested that the documents be submitted by February 28th of each year to coincide with the deadlines for archaeological permits and that the defined Project Development Area be used as the basis for the maps and illustrations. Within its response to the 2016 final written submissions, Sabina agreed to the GN's proposed commitment.[954]

During the 2016 Final Hearing, a Community Representative from Taloyoak raised concerns that human remains could potentially be impacted by project activities and discussed potential mitigation measures:

> *Right now, I'm in the modern world, and our graves are in the modern place, but my ancestors didn't have modern grave. When one of my ancestors die, my people move on. I'm just - - I was just thinking about that. When your geologist is out there on the land, and they find one of my ancestors, would you kindly put it somewhere were you're not going to be digging*.[955]

Sabina stated in response that in addition to undertaking a full archaeological assessment of the project site with the approval of the GN, all individuals on-site would receive an introductory archaeological presentation that includes measures to be taken if artifacts are discovered. It was further clarified that "*we have identified a handful of sites within the footprint, which need to be addressed. These are small sites, usually tent rings-type things or small tools, but there haven't been any human remains"*.[956]

During the supplemental Final Hearing, a Community Representative from Gjoa Haven discussed traditional and archaeological sites, noting that:

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[953] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.
[954] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[955] R. Kayuqtut, Taloyoak, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 928, lines 10-17.
[956] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 930, lines 14-17.

We used to go and fish at our traditional camps. When I used to - - when I was a child, I used to see traditional and paleontological sites as well. There are some inukshuks which are erected here and there to give us an indication as to what type of good hunting areas we have, or it gives us direction. The – I would like to ensure that the helicopters do not … damage these archaeological sites that we treasure.[957]

Within its response, Sabina clarified the proposed location of the mine site, noting that none of the proposed main infrastructure would be constructed in the Back River Watershed and that the four (4) identified archaeological sites would require a Government of Nunavut permit to interact with. Sabina reiterated that it provides training to on-site employees with regards to known and non-identified archaeological sites and that restrictions are made with regards to access to known sites.[958]

5.8.3 Views of the Board

During the 2016 Final Hearing, the Board discussed the importance of preserving archaeological sites and mitigating potential impacts, and undertaking on-going monitoring, noting that:

it's important for us to preserve the archaeological sites because to us, those are our history. Pre-European contact, we did not have a writing system, so we used those tools as a word-of-mouth passing on to us from our -- from our ancestors that moved from inland to the coast. And there are many of us that have -- in different communities, especially in Cambridge Bay, Kugluktuk, Bathurst Inlet, Umingmaktok, and in Eastern Northwest Territories, in Ulukhaktok, and Sachs Harbour. Those are all the descendants of the Kiluhitok, Tahikyoak, and Lac de Gras area.[959]

Sabina responded that it had undertaken, and would continue to undertake, discussions with the Government of Nunavut – Department of Culture and Heritage (GN-CH) as well as the Kitikmeot Heritage Centre. Sabina reiterated commitments made to report to the GN-CH and added that it was:

… quite confident through both those groups that we can address those few archaeological sites in an appropriate way, and not only that, but also take care of any new finds that may be identified during construction and any additional sites that we don't actually impact but are in close by. We still will report back to the Government of Nunavut on those.[960]

Within the 2016 Final Hearing Report, the Board acknowledged Sabina's commitments with regards to heritage resources and further noted its appreciation the GN's clarification on annual archaeological reporting requirements.

[957] S. Qitsualik, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 683, lines 7-15.
[958] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 683-685, lines 5-26, 1-26, and 1-6.
[959] A. Maghagak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 365, lines 15-26.
[960] M. Pickard, Sabina, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 366-368.

During the supplemental Final Hearing, the Board asked Sabina if it was planning to work with Elders or Inuit land users to provide feedback and interpretation of any archaeological and paleontological findings. In response, Sabina noted that, in addition to the Government of Nunavut requirements associated with the four (4) identified archaeological sites, it has had multiple discussions with the Kitikmeot Heritage Society and intends to further engage with existing programming. Sabina added that if it were to undertake monitoring of the sites, it would include community members, which could include youth or Elders.[961]

5.8.4 Conclusions and Recommendations of the Board

The Board notes consistency in Sabina's responses during both the 2016 and supplemental Final Hearings. In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to heritage resources could be appropriately managed through the commitments provided by the Proponent and application of key mitigation measures associated with required archaeological reporting.

Recognizing Sabina's commitment to archaeological reporting, the Board further recommends the following term and condition (the text that follows is a summary provided for convenience only; the full text is provided in Section 8: Recommended Project Specific Terms and Conditions):

- Requiring reporting regarding the current status of all archaeological sites within the Project Development Area to the Government of Nunavut – Department of Culture and Heritage (GN-CH) in any year in which changes to the project footprint are expected to occur or an archaeological permit will be requested.

5.9 HEALTH AND WELLBEING

5.9.1 Views of the Proponent

Sabina discussed its assessment and proposed mitigation and benefit enhancement measures with regards to health and community wellbeing in Volume 8, Section 3 of its FEIS. Within Volume 8, Sections 3.5 to 3.8, Sabina concluded that the Back River Gold Mine Project (Back River Project or the Project) would result in both positive and negative residual, cumulative, and transboundary effects on health and community wellbeing through changes to life skills, individual and family spending, and family and household function as a result of increased incomes. Sabina emphasized that its effects assessment on the Health and Wellbeing valued socio-economic component (VSEC) was based on knowledge and understanding of the relative issues, both current and historical, within the Kitikmeot region.

Sabina considered the following two spatial assessment boundaries for its effects assessment on health and wellbeing:

- *Local Study Area (LSA)* – The west Kitikmeot region, including the communities of Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, and Kugluktuk.
- *Regional Study Area (RSA)* – The west Kitikmeot region and the east Kitikmeot region, specifically the communities of Gjoa Haven, Taloyoak, and Kugaaruk, as well as the city of

[961] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 347-348, lines 1-26 and 1-24.

Yellowknife, Northwest Territories.

Wellbeing was considered as a broad concept associated with overall wellness or quality of life based on interactions between existing social, economic, and cultural conditions. Factors contributing to wellbeing were identified as: health status, food security, housing and infrastructure, community and family, economy and governance, knowledge and learning, culture and language, health behaviours, and access to health services. Health was associated with broader implications of changes to wellbeing, specifically related to physical manifestations, including respiratory issues, cancer, injuries, and sexually transmitted diseases. Predominant issues affecting community wellbeing within the Kitikmeot region were identified as food security, unemployment, substance abuse, and suicide.

Life Skills of Individuals

Sabina predicted that increased income and financial independence associated with the Back River Project could result in increased individual and community self-reliance and life skills, particularly during the operation phase. Sabina further predicted that increased life skills would have a positive residual impact on health and community wellbeing. Increases to life skills was characterized as the ability to obtain and retain employment, manage income and/or family finances, make decisions that are ultimately supported by ones' family members and the community, and generally become an individual that models a positive and productive economic and social role. Sabina discussed the social relevance of behaviour modelling and suggested that youth within the Kitikmeot region could be indirectly affected as a result of project employees modelling behaviours associated with increased life skills within their respective communities. Lastly, Sabina projected that increased life skills and capacity associated with project employment could assist employees with the transition from operation to closure phases and be retained and remain relevant even after project employment ceases.

Using observations associated with similar projects operating in northern Canada, it was stated that deficiencies in life skills were cited as a contributing barrier to mine employment for northern residents. Sabina noted that its proposed project-related education, training, employment opportunities, and available programs would contribute to increases in life skills. Specific measures were detailed within the Human Resources Plan, available in Volume 10, Part 28, which included: cross-cultural awareness training; access to the Inuit Employment and Training Coordinator; ongoing personal development counselling; and an employee and family assistance program.

Individual and Family Spending

Sabina predicted that project employment and increased incomes would cause changes to individual and family spending during mobilization and construction and operations. It was clarified that individuals' spending habits would dictate whether the predicted effect on health and community wellbeing would be positive or negative. Sabina discussed the potential for positive spending choices to result in numerous benefits to individual, family, and community health and wellbeing. Positive spending choices were identified to include, but not be limited to, increasing personal savings, funding family members' education, repaying debts, and purchasing tools related to subsistence harvesting. Sabina projected that if the majority of project employees made positive spending choices there would be substantial increases to health and community wellbeing. Alternatively, consumption of substances such as alcohol and drugs or engaging in negative social behaviours including gambling, domestic violence, crime, or child neglect could result in negative effects on health and community wellbeing. Sabina identified the following four (4) potential negative effects associated with increased incomes:

- Changes to housing and income support, which are income dependent;

- Changes to food security, traditional harvesting, and country foods consumption;
- Increases in rates of substance abuse; and
- Increases in crime, domestic violence, and sexually transmitted illnesses and risky sexual behaviours, mainly as a result of increased levels of substance abuse.

Housing and Income Support

In the FEIS it was suggested that decreases to public housing subsidies as a result of increased income could provide a disincentive for some individuals to engage in project employment. Sabina noted that through the Government of Nunavut – Nunavut Housing Corporation's new Public Housing Rental Scale, which gradually scales the housing subsidy according to income, individuals could gradually transition into their new financial position and responsibilities. Sabina responded to local concern and predicted that even if indirect and induced employment would be higher than predicted, the demand for public housing would remain negligible. Sabina also predicted that the employment opportunities and increases in income associated with the Project would reduce the number of individuals receiving income support and result in increased self-reliance at the community level. It was further suggested that project-generated income could result in local residents investing in private housing accommodations.

Wage and Subsistence Economies, Food Security, and Country Food Consumption

Sabina noted that through project employment individuals could have an opportunity to provide for their families within the wage economy while continuing to participate in land use and family activities. It was further projected that if individuals were previously unable to engage in land-based activities, project employment could result in an overall increase in subsistence harvesting and consumption of country foods. Sabina also noted that as traditional foods are often shared, increased income among project employees and resulting engagement in subsistence harvesting could reduce food security concerns at the community level.

Substance Abuse, Crime Rates, and Domestic Violence

Sabina expected that increased substance abuse would not be an issue for most workers, citing recent studies from the Jericho, Ekati, and Diavik diamond mines. Responding to concerns that crime rates would increase, Sabina stated that crime related to resource development is primarily a result of an influx of workers into communities as well as increased income levels, which creates the potential for increased substance abuse issues. Sabina qualified this by stating in Table 3.3-4 that it did not expect project personnel to impact community security levels as they would be housed on-site.[854] Sabina predicted with medium confidence and moderate probability that any negative effects on health and community wellbeing resulting from changes to individual and family spending would be not significant, low in magnitude, of long duration and continuous frequency, extending to the RSA (employment dependent), and reversible.

Sabina predicted that employment and income associated with the Project and one (1) or more future projects would potentially result in overall positive, and potentially negative cumulative effects for individuals, to health and community wellbeing (summarized in Table 3.5-18: Summary of Residual Effects on Overall Significance Rating for Employment).[962] Sabina predicted with medium confidence that any project-related cumulative residual effects would be not significant and that the nature of

[962] FEIS, Table 3.5-18: Summary of Residual Effects on Overall Significance Rating for Employment, Volume 8, Section 3, p. 102.

potential effects would generally be the same as predicted for residual effects. However, Sabina predicted that the magnitude of potential cumulative impacts would be moderate, as either a positive or negative outcome would be considered to represent a notable change from baseline conditions and would affect a number of households. Sabina predicted that the Back River Project could also result in transboundary effects for employees and their families who reside in small northern communities outside of the Nunavut Settlement Area, and would be less applicable for families residing in large urban centres.

Using a precautionary approach, Sabina developed mitigation and enhancement measures to address potential project-induced residual, residual cumulative, and transboundary effects to health and community wellbeing resulting from changes to individual and family spending. Sabina clarified that with the exception of measures specifically targeted at Inuit from the Kitikmeot region, proposed measures would apply to all project employees. Sabina expected that other projects contributing to cumulative impacts would utilize similar mitigation strategies. Employees would have access to a number of services including an Inuit Employment and Training Coordinator, counsellors, and a financial management program. Within the Human Resources Plan financial management orientation was noted to include: household budgeting, information on banking and financial services, and additional counselling and/or advice upon request. Sabina noted that it would work with the Nunavut Housing Corporation to integrate information into its financial management programming related to changes to rent level, budgeting monthly rent payments, and setting up direct payment options with the Nunavut Housing Corporation. The objective of these services was noted to facilitate Inuit inclusion in mine employment in a way that is complimentary to Inuit culture and sustainable. Sabina noted that it would enforce a zero tolerance rule related to alcohol and drug use and that regionally available programs and counselling would remain available to project employees.

Family and Household Structure

Sabina predicted that due to the importance and value placed on the family unit in Inuit culture, predicted project-induced changes to family and household structure could result in negative residual, cumulative, and transboundary effects. Sabina predicted with high confidence and moderate probability of occurrence that potential project-related negative residual impacts would be not significant due to their expected low magnitude and reversibility. Sabina projected that resulting effects would be continuous in frequency and, depending on where employees are hired, extend to the RSA. To assess potential project-induced effects on wellbeing and health as a result to changes to family and household structure, Sabina considered potential effects to families and relationships. Sabina predicted that direct project employment and a fly-in/fly-out rotation schedule, regardless of project phase, has the potential to change family and household function, particularly through spousal or parental absence.

Sabina noted that separation as a result of work schedules could cause strain on a relationship and result in tension from factors such as loneliness, jealousy, and feelings of distrust. Results from an independent study on the impact of a fly-in/fly-out rotation schedule on families and communities in northern Saskatchewan were used to identify the following potential negative effects:

- Increased strain on remaining spouse from increased workload and making decisions independently;
- Increased worry and concern for absent family members;
- Increased rates of family violence and break-ups;
- Difficulties for younger children experiencing a parent's absence, requiring a period of

adjustment; and

- Loneliness associated with separation from family.

It was noted that a majority of the participants interviewed as part of the study reported that their respective relationships were both positively and negatively affected by the nature of the rotation schedule and indicated that through time the arrangement became more normalized. Sabina further noted that many families within the Kitikmeot region have had prior experiences with spousal and parental absences due to mine employment, medical travel, and lack of housing. Sabina projected that spousal and parental absences as a result of the rotation schedule would differentially affect families, with some having more difficulties adjusting than others. Sabina concluded that families could face additional adjustment post-project employment from the re-introduction of family members.

Sabina further predicted that the simultaneous development of the Back River Project and one (1) or more future projects also employing a fly-in/fly-out work rotation schedule could result in negative residual cumulative effects. Sabina predicted with medium confidence that any project-related negative cumulative residual effects would be not significant and would be unlikely to be experienced by more than a few families. The nature of related potential effects was the same as predicted for residual effects. Sabina predicted that the Back River Project could also result in negative transboundary effects where families residing in small northern communities outside the Nunavut Settlement Area may be similarly affected by changes to family and household structure.

Sabina discussed proposed mitigation measures that would promote worker wellbeing, including: ensuring employees can communicate with their spouses while on-site, access to an Inuit Employment and Training Coordinator; intercultural awareness training provided to all employees; and provision of an employee and family assistance program. Sabina further discussed its proposed socio-economic monitoring program that would utilize an adaptive management approach through which Sabina would monitor, review, analyse, and report on a number of socio-economic indicators important to Kitikmeot residents to be monitored throughout the life of the Project.

Sabina discussed the potential project effects on health and community wellbeing and associated mitigation measures proposed in Volume 8, Section 3 of the FEIS Addendum under FHR-NIRB-5.9(A) – Health and Wellbeing of Employees and their Families. Additional information was provided by Sabina specifically to address conclusions in the 2016 Final Hearing Report that there was considerable uncertainty related to the potential effects of scheduling on the health and wellbeing of employees and their families, as well as potential effectiveness of the proposed mitigation measures. Sabina concluded that none of the additional information presented in the FEIS Addendum would affect its conclusions with regards to the socio-economic assessment as presented within the FEIS.

In response to the Board's concerns as expressed in the 2016 Final Hearing Report that the Project could impact the already strained public housing sector in the Kitikmeot region, specifically in Cambridge Bay, which could compound existing effects to community and individual wellbeing, Sabina re-stated its previous conclusions that the Project would not result in negative effects to public housing and that there would be a low likelihood of significant project-related in-migration to the Kitikmeot region. Within the FEIS Addendum, Sabina further reiterated the prediction cited within Volume 8 of the FEIS that the Project would likely result in increased housing investments by local residents and decrease the number of individuals receiving income support.

Sabina agreed with the Board's views as expressed in the 2016 Final Hearing Report that the supply and maintenance of housing in Nunavut is primarily a government responsibility, and it further outlined commitments made during the 2016 Final Hearing to collaborate with the Government of Nunavut and the Nunavut Housing Corporation on potential housing initiatives to enhance employee access to various housing options. Sabina further outlined its proposed measures and commitments made to address potential financial management challenges for employees. Services that would be available to project employees to address potential negative project effects on health and wellbeing were listed, including access to trained counsellors and an Inuit Employment and Training Coordinator and other wellness-related programs, such as the establishment of an on-site country food kitchen and availability of country foods on a semi-regular basis. It was noted that the Inuit Impact and Benefit Agreement being negotiated between Sabina and the Kitikmeot Inuit Association would be expected to include provisions related to the development of Traditional Knowledge and wellness-related programs.

Sabina acknowledged a Board concern and noted in the FEIS Addendum that, although it would avoid, wherever possible, frequent changing of accommodations within a work rotation, a limited number of positions would require changes to accommodation due to multiple factors, including scheduling and job-type and individuals would be made aware of any requirements in advance of applying. Sabina concluded with a commitment made in Volume 10, Section 28 of the FEIS to ensure health, safety, and wellbeing of all project personnel as well as to their families.

5.9.2 Views and Concerns of Interested Parties

Within its 2016 final written submission on the FEIS, the Government of Nunavut (GN) commented on potential project-induced impacts on the demand for public housing in the Kitikmeot region and associated effects of overcrowding on individuals.[963] The GN noted that although Sabina anticipated that the Project could alleviate the increased demand for public housing, it does not appear to have occurred in association with the diamond mines in the Northwest Territories. The GN made further reference to predictions made within the FEIS that the Project would be expected to result in increased demand for public housing and likely adverse impacts to the Kitikmeot region's housing situation. The GN recommended that the Proponent collaborate with the GN and the Nunavut Housing Corporation to identify potential housing solutions as well as to administer the proposed financial management orientation with specific consideration for private home ownership. The GN further recommended that Sabina collaborate with the GN and the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) to design and implement a voluntary housing survey for Nunavummiut employees to monitor project effects on housing supply and demand. In its response to the 2016 final written submissions, Sabina clarified predictions made in the FEIS that there would only be negligible project-induced effects on public housing within the Kitikmeot region and that project-generated income could lead to increased participation in the private housing market.[964] Sabina concluded that while the supply and maintenance of housing in Nunavut is primarily the responsibility of the GN, it would collaborate with the GN and the Nunavut Housing Corporation on potential housing initiatives and committed to collaborating with the two (2) parties and the K-SEMC to administer a voluntary housing survey. During its presentation at the 2016 Final Hearing, the GN did not note any outstanding concerns with Sabina's response to the Department's proposed terms and conditions in relation to this Valued Socio-Economic Component.[965]

[963] Government of Nunavut, 2016 Final Written Submission, March 7, 2016.
[964] Sabina Gold & Silver Corp., Response to 2016 Final Written Submissions, March 31, 2016.
[965] Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 411, lines 1-26.

During the 2016 Final Hearing, Community Representatives also discussed existing housing constraints within the Kitikmeot communities and questioned the Kitikmeot Inuit Association (KIA) on whether housing would be included within the compensation agreements being negotiated with Sabina.[966] The KIA noted that while it acknowledged related issues within the Kitikmeot communities, housing is the responsibility of the GN and as such it would "*likely be very difficult to include provisions that would meet the back log of housing in the Kitikmeot region through a single agreement with the company*".[967] One Community Representative from Gjoa Haven commented on the discussions that project employment could facilitate home ownership by Kitikmeot residents and asked:

> *Will the government be encouraging the people that are going to be applying for housing, are they going to be subsidizing some of the housing because I believe the life of the mine is probably going to be between 10 and 12 years, and my calculations tell me that that's not going to be enough time to become a complete homeowner.*[968]

The GN noted in response that while a typical mortgage length would exceed the proposed life of the mine for the Project specifically, Kitikmeot residents could use the skills acquired to find employment with the mining industry, or opportunities in other industries, through transferable skills: "*So just because you can't stay with one project your entire life doesn't mean you can't be employed by the industry as a career*".[969] The GN provided additional information about government assisted financing[970] and outlined the recent changes in rental scale in response to a concern raised by a Community Representative from Cambridge Bay that project employment could result in increased rent for employees living in public housing.[971]

Multiple comments and concerns were raised by Intervenors and Community Representatives during the 2016 Final Hearing, as well as during the supplemental Final Hearing, on the type of support that would be available to Inuit employees and their families during their employment with the Project (e.g., managing shift work and the fly-in/fly-out nature of the work and potential associated social and relationship issues). A Community Representative from Cambridge Bay asked for further clarification from Sabina on what would be included within the Employee Assistance Program:

> *When you talk about the – the employee assistance program and working with those who are actually on site, are we just talking about actually giving them further guidance on site, or are we looking at working with -- especially from the communities because this is kind of a new venture where it's rotational work and that there will be support for them while they're on site,*

[966] See for example H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1082, line 25. P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1094, lines 3-10.
[967] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1095, lines 10-13.
[968] P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1132-1133, lines 24-26 and 1-4.
[969] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1133, lines 20-22.
[970] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1133-1134.
[971] L. Kamermans, Government of Nunavut, 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1142-1143.

as well as support for those who are off site.[972]

Sabina responded that the Employee Family Assistance Program would be re-assessed through adaptive management to ensure the systems put in place would be appropriate for the northern context in which it would be conducted.

> *So that program is not just specific to site. It is meant to be used by both the employee and the family at any time during their employment. The program itself generally starts off with phone calls and into a central hub, which then we can provide additional support, expertise in that area to help -- help the employee address the concern. We acknowledge that in order to get people to stay at site, we need to make -- address any concerns they have. We also need to address the family concerns because we know how tightly bound Inuit are to family, and that's of vital importance.*[973]

Sabina clarified that the Program would be in effect during construction and noted that to support this effort, Sabina had consulted with Baffinland Iron Mine Corp. and Agnico Eagle Mines Ltd., proponents of mining developments in the Qikiqtani and Kivalliq regions, respectively, and would incorporate lessons learned into the proposed Program.[974]

The Community Representative from Cambridge Bay discussed past mining experiences in Nunavut with a focus on different lengths of rotations. The Community Representative raised additional questions regarding the length of the proposed rotation schedules for the Project, noting that time on-site could have adverse effects for employees and their families from being away from home for extended periods of time.[975] Sabina stated in response that while the standard rotation schedule would be two (2) weeks on-off, some circumstances, such as a particular job, could potentially necessitate the need for individual's to stay for longer periods on-site.[976] It was noted that support for rotation schedules would be included within the Employee Family Assistance Program and that rotation schedules would be revised as needed and also assessed by the KIA to "*ensure that individuals stay or have the tools to stay in their jobs*".[977] Telephone and internet connections would also be made available to employees on-site. In follow-up, the Community Representative stated:

> *It's also the hope and desire that as projects are being developed and go through the process of what you're going through to date that the wellbeing of our people in the region are front and foremost, that they have every opportunity to train and to get into … There is tremendous*

[972] H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1009, lines 14-22.
[973] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1010, lines 5-16.
[974] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1009-1010.
[975] H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1011-1013.
[976] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp, 1011-1015.
[977] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp, 1011-1015, lines 1-2.

opportunity in the mining industry, although it can be a very short-lived situation[978]

A Community Representative from Gjoa Haven commented on the potential shift rotations for drivers on the proposed winter ice road, noting that:

> *I know earlier on, you guys were saying it's about six hours travelling in one direction, and the total journey is about 16 hours including loading and offloading. My question is just how many people will be sharing a vehicle and, you know, the reason I'm asking that question is the 16-hour journey for one person to travel in one vehicle is a bit long.*[979]

Sabina noted in response that:

> *So to address the travel on the ice road, it is a 16-hour round trip, and the current plan is that we'd actually run three eight-hour shifts so you'd actually have three people that would kind of be sharing the load. So you'd only drive one direction on your shift, and then there's camps on either end; so really an employee or driver would drive up from one camp to the other, they'd sleep there for the night or take their rest and then drive back the next day likely or switch back and forth like that. It should also be noted that we have been quite conservative in the estimates on speeds that we can travel on there and that to ensure that we do have a good starting place for it. Once we actually get on there and start travelling the road, we'll have a better idea, and we can adjust travel schedules as needed. So, I mean, obviously the priority would be to the safety of the drivers and making sure that they aren't overtired, and they do have the proper amount of rest to ensure that they can safely drive that road.*[980]

For additional information related to the safety of drivers along the proposed winter ice road see Section 5.11: Human Health and Safety.

An Elder from Cambridge Bay raised questions on health, safety, community, and wellness and asked what support would be made available to employees, specifically with regards to additional counselling. Sabina outlined its proposed Employee and Family Assistance Program and clarified in response that the Employee Family Assistance Program could include multiple types of support, including alcohol and drug-related counselling. It was noted that while services would be initially provided to employees and their families via telephone, an on-site Inuit Coordinator would be available to facilitate support measures in association with the human resources department and additional support counsellors and treatment systems that would be made available if needed.[981] In response to additional questions raised by a Community Representative from Cambridge Bay, Sabina noted that additional on-site wellness services would include recreational facilities, including gymnasiums and television areas.[982]

A Community Representative from Cambridge Bay similarly questioned the KIA on its role in promoting

[978] H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 815, lines 8-17.
[979] P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1269, lines 3-7.
[980] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1271, lines 5-24.
[981] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 926-927.
[982] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1027-1029.

the social wellbeing of Inuit in association with the Project, particularly with regards to the Employee Family Assistance Program, and particularly social wellbeing. In response, the KIA noted that considerations with regards to wellbeing would be included within the project-specific IIBA to be signed with Sabina and could potentially include social training and counselling. It was clarified that housing related issues would not be included within the IIBA.[983]

A Community Representative from Kugluktuk questioned the KIA on the social, cultural, and political considerations with regards to community initiatives to be included within the IIBA and whether any community members would be involved in the IIBA negotiation. The KIA noted in response that while it could provide a detailed response on the content of the IIBA due to the stage of the negotiations, it expected these topics would be addressed through the IIBA. It was further stated that while community members could provide input through community consultations, the specific negotiations on the IIBA topics are conducted by a team of experts and legal counsel.[984]

During the supplemental Final Hearing, the Government of Nunavut (GN) and a Community Representative from Kugluktuk discussed potential impacts on health and wellbeing that could result from rotational employment.[985,986] In response to a request for information on its proposed programs and strategies to address potential issues related to rotational employment, Sabina clarified that it would focus on the wellbeing of employees as well as their families and ensuring their readiness for mine work through programs related to pre-employment training, information sessions, and the Employee and Family Assistance Program. Sabina further outlined its Employee and Family Assistance Program, noting that it was tailored to the northern environment, noting also that it was incorporating lessons learned from successful programs and services at the Meadowbank Gold Mine. Opportunities to collaborate with organizations and governments to utilize and contribute to existing programs were further discussed.[987] The GN further noted its view within its presentation at the supplemental Final Hearing that the Board's concerns as expressed in the NIRB's 2016 Final Hearing Report regarding the potential effects of rotational employment on the health and wellbeing of employees and their families would be addressed through the Kitikmeot Region Socio-Economic Monitoring Committee, project-specific Socio-economic Monitoring Program, and project-specific socio-economic working group.[988] The GN concluded that Sabina's adoption of the commitments, terms, and conditions proposed by the GN throughout the review of the Project would "*strengthen the proponent's conclusions and increase our confidence that the proposed socioeconomic benefits and offered environmental protections will be felt by Nunavummiut through the life of the Back River Project*".[989]

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[983] S. Anablak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1082-1083, lines 14-26 and 1-10.

[984] S. Anablak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1090-1091.

[985] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 334, lines 4-9.

[986] E. Elias, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 671-672, lines 2-26 and 1-23.

[987] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 334-337.

[988] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 454-455, lines 21-26 and 1-8.

[989] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 456, lines 4-8.

A Community Representative from Taloyoak described his family's history with working on mine sites and noted the difficulties of working rotational schedules:

> *When I was working there, we worked on rotational -- on a rotational schedule. We did shift work. Sometimes in the evenings, it was very difficult. We got homesick".*[990]

> *I am pretty sure that the -- your employees that you have will become homesick at times. Is there some form of -- will you be able to provide some type of entertainment or theatre system of some kind in your -- at your mine site so that they don't get homesick so much?*[991]

Within its response, Sabina re-iterated that the majority of its employees would be working two (2) week rotations and outlined some of the measures it would take to ensure employees would be comfortable while on-site and able to communicate with their families, including providing internet, leave options, and employee and family orientation.[992]

During the supplemental Final Hearing, a Community Representative from Kugluktuk commented on potential impacts to employees and their families from rotational work, specifically as relates to interpersonal relationships and potential alcohol abuse, noting:

> *Now -- now, mining has come into our region, and most of the men in our community are working at the mine and exploration sites at Diavik and Ekati as well. Up to today, we have work – miners working there. And there are men that work and women that work for TMAC as well. And during their exploration days, they have worked since the 1970s. Many of the families have been impacted through … [the] … two-week rotational system. It's become very difficult for families to cope with that system. Many women have learned to deal with -- dealing with their families and even hunt on their own to provide for their family -- their families.*[993]

> *There are also cons to working at the exploration camps. When they return -- when the workers return to their -- to their homes, there is alcohol problems. My father has worked in the oil and gas field, and we went through the same experience. He -- he also experienced alcoholism, but he switched -- made a switch to not do -- to do that. He went out hunting. And some families -- there are some breakups in some families through -- the relationships have been stressed; children have been impacted.*[994]

The Community Representative asked Sabina whether Nunavut employees would have direct transportation from their home communities to the mine site rather than having stop-overs in

[990] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 693, lines 19-22.
[991] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 694, lines 15-20.
[992] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 695-696, lines 17-26 and 1-8.
[993] E. Elias, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 671, lines 14-26.
[994] E. Elias, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 672, lines 9-18.

Yellowknife as a means of reducing potential opportunities to purchase drugs and/or alcohol.[995] Sabina noted in response that in limited cases there would be direct flights from Kugluktuk and Cambridge Bay to the project site and likely from Gjoa Haven, Taloyoak, and Kugaaruk. Sabina acknowledged that it would like to forego layovers in Yellowknife to the extent possible.[996]

Within its final written submission on the FEIS Addendum and during the supplemental Final Hearing, the Burnside Hunters and Trappers Organization (BHTO) raised concerns that community members could potentially be negatively impacted if alcohol or drugs were made available to community members as a result of improved access from project-related activities.[997] Sabina noted that it had conducted a detailed socio-economic impact assessment with participation by community members to address similar concerns expressed throughout the Kitikmeot region. In addition to its related management plans and programs, Sabina discussed its zero-tolerance position on drugs or alcohol being present on-site and further outlined its proposed on-site security measures, including bag checks, and the potential for increased measures such as x-ray machines and sniffer dogs.[998,999,1000] Sabina added that it would establish policies to ensure visitors would not be bringing banned substances on-site.[1001]

Additional concerns were expressed by community representatives with regards to potential negative impacts related to drug and alcohol usage:

> *Alcohol and drugs are a big problem in the north. I wonder if there's any possible way that we could deter those people that provide alcohol and drugs to our youth to stop, if they could be interjected [sic] in some way, perhaps by the police. We would like to see young people continue to work at the mines, including yours.*[1002]
>
> *There are a lot of social problems that -- you know, being alcohols and, you know, some drugs, things that – new substance that we never experience in the past come into our communities. So that -- I really can't blame the industry for it, but yet, we have to learn how to get around it…*[1003]
>
> *I totally agree with everyone that's been talking about employees going into the mine site and using alcohol or drugs. That is not a good thing to have on a mine site, for that matter, in the*

[995] E. Elias, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 672, lines 19-23.
[996] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 673-674, lines 11-26 and 1-6.
[997] C. Kapolak, Burnside Hunters and Trappers Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 872-874, lines 20-26, 1-26, 1-14.
[998] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 94, lines 11-26.
[999] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 339-342, lines 9-26, 1-12, 14-26, and 1-10.
[1000] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 692-693, lines 2-26 and 1-3.
[1001] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 875-877, lines 20-26, 1-26, and 1-10.
[1002] M. Aglukkaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 692, lines 2-8.
[1003] J. Judas, Behchoko, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 728, lines 17-23.

communities, not just the drugs, but, as well - - alcohol as well.[1004]

Sabina responded that in addition to bans on drugs and alcohol on-site and direct transportation from home communities to site, support would be available through the Employee and Family Assistance Program.[1005]

In response to questions raised by a Community Representative from Gjoa Haven, the Kitikmeot Inuit Association (KIA) noted that while it does not have statistics on how many mine-related job offers have been rescinded due to substance use, it is common.[1006] In follow-up, the Community Representative recommended that a treatment centre should be established in the Kitikmeot communities:

> *There is no place where these people can – in Nunavut, anyway, there's no place where they can go and get treatment for drug and alcohol abuse. There is no place for them to go and get treatment. Perhaps you can make a recommendation to have a treatment centre so that we can see more people lead a better productive life for themselves.*[1007]

The KIA responded that it would follow-up with Sabina regards to establishing a database and statistics on why individuals leave their positions of employment once hired.[1008] Sabina noted that while it has committed to monitoring retention rates for all employees and to annually communicate results, it would need to respect privacy laws with regards to releasing reasons for departures. Sabina stated that it could coordinate with the KIA and the Socio-Economic Monitoring Committee, and potentially TMAC Resources Inc., with regards to collecting and communicating such data.[1009]

In response to a Community Representative's question related to Inuit youth being released from mining positions due to drugs or alcohol, the KIA noted that it passed a resolution that drugs and alcohol be banned at the mines and stated that it is up to a proponent to develop and inforce their associated policies.[1010]

During the supplemental Final Hearing, the BHTO noted that employees may not feel comfortable accessing services or addressing issues that could arise while on-site, for example between employees. The BHTO recommended that Sabina ensure that Inuit employees are not being asked to undertake less-desirable work-related activities by other employees. Sabina responded that all job requirements would be clearly defined and that while it would not want employees to take on work that was not anticipated,

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[1004] J. Qiqurt, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 911, lines 17-22.
[1005] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 728, lines 7-26 and p. 731, lines 4-18.
[1006] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 889-890, lines 10-26 and 1-11.
[1007] J. Ugyuk, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 891, lines 4-10.
[1008] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 893, lines 1-16.
[1009] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 894-895, lines 16-26 and 13.
[1010] P. Emingak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 866-868, lines 17-19, 23-26, and 1-9.

there could be opportunities available for individuals to both formally and informally gain expertise in other areas, for example, through job shadowing.[1011]

In response to similar potential issues raised by a Community Representative from Gjoa Haven to the KIA that Inuit employees may face on a mine site and need for communications, the KIA noted that if individuals raise issues with the organization it would follow-up to address them.[1012]

In response to a question from a Community Representative from Kugluktuk on how to encourage people, particularly youth, to seek employment rather than relying on income support, Sabina acknowledged the difficulties with mine work and that "*we have to do it together*".[1013,1014] Sabina further discussed difficulties relating to rotational schedules and noted that it is willing to work to support employment opportunities and employees on-site.[1015]

One community member from Cambridge Bay discussed the importance of ensuring project employees are supported while on-site and noted that "*there is a thing called the 'employee assistance program,' and I will forever, as long as I come to public meetings, always stress the fact that employee assistance programming is paramount."*[1016] Sabina noted in response that its Employee and Family Assistance Program would be tailored for the North and that support would be provided for families as well as employees.[1017]

A community member from Cambridge Bay emphasized the need for two-way cross-cultural training of all project staff and asked Sabina whether this type of cross-cultural training would be offered on a one-time or continual basis. Sabina noted in response that it would ensure that cross-cultural training is undertaken on a continual basis by Inuit and non-Inuit staff alike.[1018]

5.9.3 Views of the Board

As previously noted in sections 5.1.3 and 5.1.4: Economic Development and Opportunities, the Board agrees with the general recommendations presented by the parties that Sabina be required to collect and analyze project-specific socio-economic data and develop a project-specific monitoring program in collaboration with agencies, affected communities, and the Kitikmeot Socio-Economic Monitoring Committee. The Board also, as previously noted, appreciates Sabina's commitment to support and

[1011] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 338-341, lines 12-26, 1-8, 15-26, and 1-13.
[1012] P. Emingak, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 870-872, lines 20-26, 1-8, and 6-16.
[1013] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 675, line 20.
[1014] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 674-676, lines 12-26, 1-26, and 1-11.
[1015] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 674-675, lines 13-26, 1-26, and 1-11.
[1016] H. Magsagak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, p. 738, June 2, 2017 lines 22-25.
[1017] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 738-740, lines 4-26, 1-26, and 1-13.
[1018] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 741-742, lines 1-26 and 1-26.

participate in regional and territorial socio-economic monitoring efforts and programs, as well as its stated commitment to collect and provide analysis of socio-economic data related to the Back River Gold Mine Project.

The Board shared concerns with the Kitikmeot Inuit Association (KIA), the Government of Nunavut (GN) and Community Representatives, as expressed during the 2016 Final Hearing, that the Project could impact the already strained public housing sector in the Kitikmeot region, specifically in Cambridge Bay, which could compound existing effects to community and individual wellbeing. Although the Board acknowledges Sabina's expectations that project-generated income could lead to increased rates of private home ownership, as presented again in the FEIS Addendum, the Board remains concerned that the actual rate of participation in the private housing sector would not be at the levels predicted. However, the Board does acknowledge Sabina's statements during the 2016 Final Hearing that if Kitikmeot residents were required to relocate to a direct point of hire, specifically Cambridge Bay, housing would be arranged.**Error! Bookmark not defined.** While the Board still finds there was a lack of information provided on the potential effects to health and wellbeing at the individual and community level from relocating individuals and their families, the Board acknowledges that Sabina is not directly responsible for providing housing to employees while off-site.

The Board further recognizes the difficulties faced by the GN, including the limited resources available, to provide public housing. During the supplemental Final Hearing, the Board asked the GN to provide information on its rent scale system and asked if there were mechanisms in place to address sudden losses of employment and potential resulting financial stresses from maintaining rental rates based on previous employment income.[1019] The Board further commented on unemployment rates and rent scales in some communities and asked whether the GN had any alternative means of assisting people facing hardship.[1020] In a deferred response, the GN noted that in the event a person in public housing lost their means of employment, they would need to notify the local housing authority to adjust their reported household income and associated rent. The GN further noted that the maximum rent to be paid for public housing is 30% of household income.[1021] The Board appreciates the information provided by the Proponent and the GN, as well as Sabina's commitments to provide financial planning services to its employees. The Board also appreciates Sabina's acknowledgement of the housing issue and willingness to collaborate with the GN and the Nunavut Housing Corporation to identify potential mitigation measures and to share data that may prove particularly beneficial to the GN in identifying and addressing project-induced housing issues. The Board supports this ongoing dialogue as essential to developing, implementing, and assessing effective housing solutions.

The Board heard many comments and questions by the GN and Community Representatives during both the 2016 and supplemental Final Hearings with regards to the proposed support programs for employees and their families and agrees that such support is extremely important to health and wellbeing. The Board appreciates that the proposed Employee and Family Assistance Program would be informed by lessons learned at other mine sites in Nunavut. During the 2016 Final Hearing, the Board questioned Sabina on whether it had considered the use of Traditional Knowledge projects on-site to be made available to employees to assist in community wellness and healing. Sabina responded that it

[1019] K. Kaluraq, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 469-470, lines 18-26 and 1-6.
[1020] G. Alikut, Board Member, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 470-471, lines 23-26 and 1-8.
[1021] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 558-559, lines 8-26 and 1-7.

would consider undertaking additional Traditional Knowledge work and would look for support from the KIA on related initiatives: "*So we're quite happy to discuss courses or that sort of thing or just general engagement on site on traditional knowledge and other topics during off hours*".[1022] While the Board had concerns for the feasibility of implementing the multiple programs and services committed to by the Proponent, the financial information provided to the Board during the supplemental Final Hearing assisted in adequately addressing these concerns.

During the 2016 Final Hearing, the Board raised questions on the length of shifts and proposed mental health support:

> *Is there any professional mental health worker at site? I'm thinking about the workers themselves. The workers may be young and have a young family at home. And once you -- if you have two weeks in and two weeks out, that adds up to half a year. Being away from that long will have a monumental effect on employee, himself, herself, or even at home. Is there any professional mental health workers at site?*[1023]

With similar questions raised by Community Representatives throughout the2016 Final Hearing, Sabina noted that the proposed shift rotation would generally be two (2) weeks on and two (2) weeks off, depending on the position and circumstance,[1024] and that:

> *All employees would have access 24-7, 24 hours a day, 7 days a week to an employment and family assistance program, which would have counsellors available to them where they could speak to them by phone discretely and confidentially, and that would be available to all employees and immediate family members.*[1025]

In response to related Board questions during the supplemental Final Hearing on the type of mental health and wellness programs that would be provided for employees and whether there would be mental health or social workers available on-site, Sabina noted its commitments to its proposed Employee and Family Assistance Program. Sabina explained that both employees and their families would be able access programs and services through the Program, and that once initial contact was made additional programs, services, or support would be made available to employees and their families depending on need.[1026] The Board acknowledges the effort Sabina has put into the development of its employee and family support initiatives and programs and appreciates the Proponent's focus on tailoring such programs to a northern environment. The Board agrees with the GN that the proposed socioeconomic benefits to Nunavummiut would be strengthened through proposed terms and conditions.

[1022] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1087, lines 2-25.

[1023] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 369-370, lines 22-26 and 1-4.

[1024] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 369, lines 4-14.

[1025] J. Prno, Sabina Gold & Silver, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 370, lines 8-14.

[1026] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 135-138, lines 23-26, 1-8, 19-26, and 1-19.

The Board further heard multiple concerns of the potential for the Project to result in drug or alcohol related issues and raised associated questions to the Kitikmeot Inuit Association (KIA) and Sabina. The Board commented to the KIA on Sabina's proposed measures to test for alcohol and drugs and asked if advanced notice could be provided to Inuit, especially youth, of these requirements prior to accepting positions and working on-site. The KIA noted that when its community liaison officers assist youth with employment opportunities they provide information on job requirements 'well in advance''.[1027] Sabina further commented on its drugs and alcohol policies and noted that these policies are established for a safety reasons and outlined the measures it takes to inform potential and new employees on its requirements.[1028] The Board acknowledges the Proponent's commitment to the health and safety of its employees and further appreciates the proposed mechanisms to keep the Back River mine site free of banned substances. The Board also appreciates the efforts made by the KIA and Sabina to inform prospective employees well in advance of employment opportunities of associated requirements. The Board agrees with the importance of collecting retention rates for all employees and acknowledges Sabina's willingness to coordinate with the KIA and the Socio-Economic Monitoring Committee on collecting and communicating, with respect to privacy laws, statistics on reasons for employee departures.

The Board also heard concerns raised by a Community Representative with regards to the proposed length of shifts and associated effects to truck drivers hauling loads along the proposed winter ice road.[1029] Following the 2016 Final Hearing, the Board had concerns of the potential for negative effects to the health and wellbeing of employees from working shifts that could include requirements for frequent changes of accommodations within a work rotation, particularly with regards to employees traveling along the proposed winter ice road. Consequently, the Board found that Sabina had not provided enough information with regards to its human resource plans specific to proposed shift work and was concerned that the health and wellbeing of employees may be adversely impacted by continually changing location of accommodations during an employee's shift.

Sabina further noted that all employees would have access to an Inuit Employee and Training Coordinator that they could speak to in confidence, a Community Liaison Officer within one (1) of the Kitikmeot communities, and the Employee Family Assistance Program. Sabina added that the Employee Family Assistance Program would be available to all employees throughout the duration of their employment whether on rotation or not, as well as to immediate family members.[1030] While the Board remains concerned that some employees may be adversely impacted by shift work and potential changes in accommodations, the Board acknowledges the nature of some job requirements on a mine site necessitate this practice; the Board appreciates Sabina's efforts in acknowledging and addressing its concerns.

During the supplemental Final Hearing, the Board asked Sabina to provide clarification on the types of cross-cultural training it proposed to provide to its managers and supervisors. In response, Sabina stated that this program would be primarily focused on the southern work force understanding Inuit

[1027] G. Clark, Kitikmeot Inuit Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 880-882, 1-26, 1-26, and 1-9.
[1028] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 882-883, lines 1-26 and 1-12.
[1029] P. Arendse, Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1269, lines 3-7.
[1030] J. Prno, Sabina Gold & Silver, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 369-371.

culture and ensuring that all employees, especially Inuit, are comfortable with being on-site. Sabina elaborated on the scope of its program, noting that all of its board of directors and executives have undertaken the Program and that it would be revised and formalized if the Project is approved.[1031] The Board appreciates Sabina's acknowledgment and appreciation of the unique cultural aspects found in Nunavut. While the Board acknowledges that the cross-cultural program would be revised and formalized throughout the life of the Project, the Board stresses the importance of ensuring that all cross-cultural training and orientation programs are effective in meeting their intended objectives.

5.9.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board expressed considerable uncertainty related to the potential effects of scheduling on the health and wellbeing of employees and their families, as well as for potential effectiveness of the proposed mitigation measures owing to the limited amount of information made available for the areas noted in the preceding section. Following a review of the new material presented by Sabina in the FEIS Addendum and the supplemental Final Hearing, as well as the updated views of Parties, the Board believes that the Project's potential effects related to health and wellbeing could be appropriately managed through the commitments provided by the Proponent and application of key mitigation measures.

The Board recognizes that the Project may place increased demand upon existing services and infrastructure as provided by the Government of Nunavut (GN) and other service providers. The Board further recognizes the value of project-specific information to the GN in terms of assessing on an on-going basis the need for public housing, and the Board acknowledges Sabina's commitment to provide information to the GN (e.g., labour force projections). The Board recommends the following, and notes that to avoid duplication, the Proponent may wish to combine the requirements of this recommendation with recommendations in Section 5.5.4: Population Demographics (the text that follows is a summary provided for convenience only; the full text is provided in Section 8: Recommended Project Specific Terms and Conditions):

- Encouraging communication and collaboration with the Government of Nunavut and the Nunavut Housing Corporation to develop housing initiatives to support employee access to a range of housing options, including homeownership; and
- Encouraging collaboration with the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC), the Nunavut Housing Corporation, and the Government of Nunavut to design and implement a voluntary housing survey to be offered to its Nunavummiut employees designed to assess and monitor the potential for project-induced effects on regional access to housing.

The Board acknowledges and appreciates the consideration Sabina gave during the 2016 and the supplemental Final Hearing to providing cross-cultural training to all employees on-site and recommends the following (the text that follows is a summary provided for convenience only; the full text is provided in Section 8: Recommended Project Specific Terms and Conditions):

- The Proponent is encouraged to work with the Kitikmeot Inuit Association to establish and monitor cross-cultural training initiatives provided for employees while on-site.

[1031] M. Pickard, Sabina Gold and Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 351-352, lines 1-26 and 1-22.

5.10 COMMUNITY INFRASTRUCTURE AND PUBLIC SERVICES

5.10.1 Views of the Proponent

Within Volume 8, Section 3.3.2 of its FEIS, Sabina noted that it did not expect the Back River Gold Mine Project (Back River Project or the Project) to affect community infrastructure and public services within the Kitikmeot region, and discussed its rational for excluding the community infrastructure and public services valued socio-economic component from its socio-economic effects assessment.

Sabina considered the following two (2) spatial assessment boundaries when discussing population demographics:

- *Local Study Area (LSA)* – The west Kitikmeot region, including the communities of Kingaok (Bathurst Inlet), Omingmaktok (Bay Chimo), Cambridge Bay, and Kugluktuk.
- *Regional Study Area (RSA)* – The west Kitikmeot region and the east Kitikmeot region, specifically the communities of Gjoa Haven, Taloyoak, and Kugaaruk, as well as the city of Yellowknife, Northwest Territories.

Using professional judgement, Sabina stated that infrastructure, including accommodations and services (including health services provided on-site) would be duplicative of infrastructure and services provided to employees in their home communities. Sabina noted that it would provide emergency and medevac services to employees while on-site, and concluded that as a result, the Back River Project would not place any additional strain on the current health systems in place within the Kitikmeot region. Sabina predicted that as employees from the Kitikmeot region would have access to health services both on-site and within their home communities, individual demand on health services within the corresponding communities of the Kitikmeot could potentially be reduced. However, Sabina concluded that overall demand for health and social services would be maintained as Kitikmeot employees would continue to access these services while off-site. For Sabina's assessment of any other potential project-induced indirect effects on community health and social services, such as due to changes in spending habits, see Section 5.9: Health and Wellbeing. For Sabina's assessment on potential project-effects to public health and environmental health, see Section 6.1: Human Health and Environmental Risk Assessment.

No new information on community infrastructure and public services was provided in the FEIS Addendum.

5.10.2 Views and Concerns of Interested Parties

During the 2016 Final Hearing, a Community Representative from Cambridge Bay asked Sabina whether a recycling management plan would be implemented on-site to positively influence Kitikmeot employees to recycle in their home communities. Sabina noted that there would be an on-site recycling program and that while it has not planned any associated initiatives within the communities, it would consider communication options if desired by community members or the Kitikmeot Inuit Association (KIA).[1032]

[1032] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1096, lines 3-11.

During both the 2016 Final Hearing and the supplemental Final Hearing, many Community Representatives questioned Sabina, the KIA, and the Government of Nunavut (GN) on the potential for the Project to re-invigorate the communities of Omingmaktok (Bay Chimo) and Kingaok (Bathurst Inlet) by addressing infrastructure and fuel needs to allow for resettlement. A representative for the Burnside Hunters and Trappers Organization noted during final remarks at the 2016 Final Hearing that

> *In the future, I would like to move back home with my family. But as you all know, when you live in Nunavut, it's very difficult to get by on what you have just in front of you. You need support from everybody. The HTO we have for Burnside HTO and the Omingmaktok HTO are very fortunate to have that still in both communities because they're the ones that provide us with fuel. We pay for the fuel, and we pay for the gasoline that comes in and out of Bathurst and Bay Chimo. Other than that, we have to get our own groceries, our own supplies and fly them in or take them in by snowmobile and sled*. We still have our houses there. We live in them all the time when we go home.[1033]

The GN stated that it receives limited funding or tax revenues in association with the Project and any funding received is distributed according to the legislative assembly rather than earmarked specifically for infrastructure improvements for adjacent communities; consequently it was suggested this topic is outside the scope of the NIRB review process for the Project.[1034]

During the supplemental Final Hearing, Sabina responded to the Burnside Hunters and Trappers Organization's (BHTO) final written submission on the FEIS Addendum with regards to the long-term stability of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo). Sabina further noted that it would provide members from these two (2) communities with preferential hiring opportunities.[1035] At the conclusion of the supplemental Final Hearing, Sabina submitted the following agreed upon commitment with the Kitikmeot Inuit Association and the BHTO

> The proponent commits to providing residents of Bathurst Inlet and Bay Chimo with complimentary space (subject to certain limits) on its annual sealift to move in needed community goods and supplies to the proponent's MLA for pickup by the community. The proponent also commits to providing complimentary storage space at the MLA for these goods and supplies.[1036]

The BHTO further discussed the viability of community members returning to Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) full time and asked the Government of Nunavut (GN) to consider

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[1033] Connie Kapolak, Burnside Hunters and Trappers Organization, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1349, lines 5-18.

[1034] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1104, lines 2-13.

[1035] See for example: M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, pp. 93-94, lines 5-23 and 1-10; C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 606, lines 2-15; M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 608, lines 10-21.

[1036] Sabina Gold & Silver Corp. and Kitikmeot Inuit Association/Burnside Hunters and Trappers Organization, Exhibit 106, NIRB supplemental Final Hearing File No. 12MN036, June 3, 2017.

facilitating such a move.[1037] In its response, the GN noted how resource development could improve the quality of life for people and discussed the potential opportunities for Nunavummiut from resource development[1038] and stated "*there's not one job out there in any of these developments that can't be done by a person from this territory, and that's what we all have to do*."[1039]

A Community Representative from Kugaaruk further noted their support of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo), noting

> *I always want to get back to my community. -- I support -- support communities in Bathurst and Bay Chimo. I remember growing up in the community. I would like to give back too. We have to look after our land. We really give back to your community. We even -- even the women would go on -- hunting on the land and fish -- and the caribou and the fish. Especially caribou, we use the whole thing and make the packers and use it for packing and used for food.*[1040]

5.10.3 Views of the Board

During the 2016 Final Hearing, the Board questioned Sabina on whether the proposed project-related shipping and need for vessels would impact the supply of ships available to communities of the Kitikmeot region for community resupply. Sabina responded that there:

> *… are federal expectations that we actually do use Canadian registered vessels before international registered vessels. So that needs to be considered. But we have heard loud and clear that community resupply can't be affected by our need for vessels. So that's something we'll have to work on and basically deal with groups like NEOS and others to ensure that we're not impacting community resupply.*[1041]

The Board directed the same question to the Government of Nunavut (GN), which noted that the GN – Department of Community and Government Services would be responsible for procurement related to community resupply as funded by the GN. The GN noted that:

> *We contract with private companies for this resupply, and we would expect that that would not be compromised by the development of a private project. And to just link us back to the proponent that they have indicated that that's not their intention. That they do not want to restrict supply for communities, and they'd be willing to work with necessary agents, including the private shipping companies that provide that service, and if it was necessary, we would -- we*

[1037] See C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 475-479, lines 22-26, 1-26, and 1-22; and C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 916-917, lines 19-26 and 1-8.

[1038] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 459-460, lines 25-26 and 1-26.

[1039] B. MacIsaac, Government of Nunavut, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 460, lines 16-19.

[1040] M. Kayasark, Kugaaruk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 715, lines 9-17.

[1041] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 1085-1086, lines 17-26 and 1-3.

would want to be part of those conversations to ensure that there is no negative impact to the communities.[1042]

The Board further asked if consideration had been given to the use of empty project-related ships to back-haul waste from the Kitikmeot communities, such as vehicles to be recycled, to the south. Sabina deferred the question to the GN, noting that while it is not opposed to project-contracted ships being used in such a capacity, the use of community re-supply vessels to backhaul community materials could be more appropriate.[1043]

In follow-up to interest raised from Community Representatives with regards to re-establishing communities such as Kingaok (Bathurst Inlet), the Board asked:

Can the Kitikmeot Inuit Association or Sabina comment on whether the Inuit Impact Benefit Agreement that will be negotiated for the Back River project can address infrastructure and fuel needs that would allow for resettlement to the Bathurst Inlet area.[1044]

While the KIA noted that community infrastructure would be the responsibility of the GN, it noted that:

… what we do notice is communities closer to project sites tend to get benefits associated with the project that would be considered spinoff benefits. We see that, in Cambridge Bay associated with the Doris North Project. That tends to be more activity in Cambridge Bay as a result of that and will likely be more activity in the future, and Bathurst Inlet, being close to the project, will likely receive associated spinoff benefits that are difficult to predict right now but could occur in the future.[1045]

The Board further asked the Burnside Hunters and Trappers Organization (HTO) "*how many people would still consider Qingauk [sic] [Kingaok] their home - - like, their hometown or homeland but are unable to live there"?*[1046] The HTO estimated that six (6) and eight (8) families, respectively, would consider Omingmaktok (Bay Chimo) and Kingaok (Bathurst Inlet) their home communities and would potentially consider re-settling if such an opportunity arose.[1047]

5.10.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board believes that the Project's potential effects to community infrastructure and public services could be appropriately managed through the commitments provided

[1042] L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 435-436, lines 25-26 and 1-11.
[1043] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1085-1086, lines 17-26 and 1-3.
[1044] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1083, lines 18-23.
[1045] G. Clark, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1085, lines 4-14.
[1046] K. Kaluraq, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1227, lines 23-26.
[1047] Cassel Kapolak, Burnside Hunters and Trappers Organization, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1227-1228.

by the Proponent and application of key mitigation measures associated with consideration of additional service-related initiatives.

During both the 2016 and supplemental Final Hearings, the Board heard many comments and questions shared by Community Representatives that indicated aspirations that the Project would re-invigorate the communities of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) and further comments encouraging the Government of Nunavut (GN) to reinstate services. However, the Board found no evidence from the Proponent, the GN, or the Kitikmeot Inuit Association that re-establishment of services in either community is likely to be induced by the Project. The Board notes that at this point it has not considered this to be a potential socio-economic effect of the Project.

The Board further acknowledges Sabina's statement during the 2016 Final Hearing that it would consider additional service related initiatives, such as 'communications options' for recycling initiatives in employee's home communities. The Board requests that the Proponent include updates on any such initiatives within its annual reporting.

The Board has not recommended specific terms and conditions in relation to community infrastructure and public services because the Board is satisfied that the potential for project-induced effects has been adequately addressed by the commitments already made by the Proponent in respect of this topic.

5.11 HUMAN HEALTH AND SAFETY

5.11.1 Views of the Proponent

Sabina presented its assessment and proposed mitigation measures with regards to human health and safety, pursuant the NIRB's Environmental Impact Statement Guidelines, through a risk assessment of noise in Volumes 4 and 8 of the FEIS, and analysis of potential accidents and malfunctions in Volume 9. Sabina's Human Health and Risk Assessment analysis of potential contaminants is discussed in further detail in Section 6.1: Human Health and Environmental Risk Assessment.

Noise Assessment

As discussed in Section 4.3: Noise and Vibration, Sabina predicted that the Back River Gold Mine Project (Back River Project or the Project) could result in potential residual effects related to sleep disturbance at the proposed location of the Goose camp. Details of the modelling undertaken to assess the environmental impact of noise and vibration associated with the project proposal were provided in the Noise and Vibration Modelling Report, available in Appendix V4-2B: Back River Project – Noise and Vibration Modelling Report. Sabina noted that while there are occupational exposure limits for noise in Nunavut, there are no noise guidelines, enforceable noise thresholds or standards, or ground-borne noise regulations, guidelines, or criteria at the Territorial or Federal level. It was further noted that the noise assessment did not consider occupational exposure by workers. Sabina's assessment incorporated Health Canada's suggested approach to characterize baseline and project-related noise to determine the potential impact on noise-sensitive receptors. Typical noise levels from familiar sources were provided by the Alberta Energy Resources Conservation Board (now the Alberta Energy Regulator)to be used in the modeling.

Using professional judgement and information from other assessments in northern regions, the LSA for the noise assessment was defined as extending 10 kilometres (km) in all directions from proposed infrastructure at the Goose Property Area. Sabina did not include the Marine Laydown Area (MLA) in its

noise modelling assessment as potential noise and vibration levels were expected to be less than at the Goose Property. The noise assessment considered the construction and operations phases; modelling was conducted for operational phase Year 3, which would reflect the year with the highest expected numbers of mobile and fixed equipment units.

Sabina considered the potential effects of sources of noise (including fixed infrastructure, mobile equipment, blasting and explosives, and aircraft) on the Goose camp and the off-duty workers residing in the camp. Based on quantitative noise modelling, Sabina predicted that noise levels for Year 3 would be below the criteria for interference with speech communications, complaints, high annoyance, noise induced rattling, and noise induced hearing loss. It was noted that as there are no known existing human receptors within 10 km of the Goose Property Area or MLA, the impacts of noise on human health focused solely on the proposed project workers' camps and the potential for sleep disturbance. The predicted noise levels from mining operations exceeded the limiting criteria at Goose Camp by four (4) decibels. Predicted noise levels from aviation did not exceed the limiting criteria inside the Goose camp and noise levels from blasting were not expected to exceed the peak sound pressure level for assessing sensitivity to impulsive blasting at the Goose camp.

Proposed mitigation measures included reducing noise levels inside buildings by a minimum of 30 decibels, which was expected to remove the majority of the potential exceedances. Sabina concluded that exceedances from predicted noise due to mining operations and blasting would be within a tolerable range and could be easily mitigated through building construction and design.

General Health and Safety

Within its accidents and malfunctions assessment, Sabina identified 18 potential major accidents and malfunctions related to the on-site health, safety, and security of employees. Sabina's process for identifying and managing risk was to identify hazards, assess the risk, evaluate existing controls, implement additional risk controls if required, and monitor and review. The identified risk assessment methodology consisted of the following four (4)-step process:

1. Identify all possible natural and human-made hazards.
2. Evaluate the frequency (probability) – The degree of risk posed by each potential hazard, rated as rare, unlikely, possible, likely, or almost certain.
3. Evaluate potential consequences (severity) of the identified risk, rated as insignificant, minor, moderate, major, or critical.
4. Evaluate the potential risk for each hazard and select an associated risk category based on probability and consequences, rated as very low, low, moderate, high, or extreme.

Sabina applied the following risk ratings to the potential major accidents and malfunctions identified above:

Table 4: Human Health and Safety

Low	▪ power outage ▪ failure of contact water containment ponds ▪ falls into containment ponds	
Moderate	▪ weather related stranding ▪ fire ▪ explosives accidents	▪ underground equipment fire ▪ open pit mine slope failure ▪ open pit mine blasting

	▪ aircraft incidents ▪ winter ice road collapse over water crossing ▪ underground mine flooding ▪ ground support failure in underground mine	▪ falls into pit ▪ Tailings Storage Facility slope failure ▪ Saline Water Pond slope failure
High	▪ vehicle incidents ▪ crane incidents	

For each identified low risk rating, the consequences and likelihood were respectively considered minor and unlikely. Sabina proposed multiple mitigation measures for each potential hazard related to design, maintenance, and emergency response procedures. Although each potential identified hazard with a moderate risk rating may have had higher predicted frequency levels or potential consequences, the overall risk rating was generally considered moderate based on operational controls and preventative measures or predicted unlikely potential for occurrence.

Sabina considered the probability of vehicle incidents occurring to be likely due to the expected frequency of vehicle usage associated with the Project. The health and safety risks associated with vehicle collisions were considered to be high. Sabina proposed multiple mitigation measures to eliminate or minimize the risk of fatalities, injuries, and incidents. These measures were categorized as equipment, procedural, and operator requirements. It was further noted that all access and haul roads would be regularly maintained and speed limits would be enforced. A mine Emergency Response Team would be tasked with managing motor vehicle accidents, and associated procedures were detailed within the proposed Road Management, Spill Contingency, Oil Pollution Emergency, and Fuel Management plans.

Sabina noted that cranes would be used throughout the majority of the project phases and could constitute a major cause of workplace injury, including fatalities. It was noted that crane incidents were considered likely even with the application of general requirements and preventative measures. The health and safety consequences of a crane related incident were considered major. Sabina proposed multiple mitigation measures to eliminate or minimize the risk of fatalities, injuries, and incidents. These measures were categorized as procedural, operator, and rigger and ground worker requirements.

Mitigation and Monitoring related to General Health and Safety

Sabina's proposed risk mitigation measures included strategies to reduce the probability and consequences of any accidents and malfunctions (e.g., reinforcing structures, establishing increased setbacks from sensitive sites, and developing system redundancies). It was further noted that a systematic approach would be undertaken whereby health and safety objectives and performance targets would be established and documented. Action plans would be developed for each potential hazard classified as representing a priority risk. Other measures include: employee training programs, inspection and maintenance programs, emergency response, environmental monitoring, and adaptive management.

Sabina further discussed the potential project effects on human health and safety in Volume 8, Section 6 of the FEIS Addendum under FHR-NIRB-5.4(A) – Potential Effects of the Project on Human Health and Safety. Sabina noted that it had provided additional information to address the conclusions in the 2016 Final Hearing Report that that there is considerable uncertainty in relation to the potential effects of the Project on human health and safety. Sabina concluded that none of the additional information presented in the FEIS Addendum would affect its conclusions with regards to the socio-economic assessment as presented within the FEIS.

Within the FEIS Addendum, Sabina spoke to the Board's significant concern as expressed within the 2016 Final Hearing Report with the proposed distance between shelters on the proposed winter ice road due to the potential for quick onset of multi-day storms and remote location of the proposed route. Sabina noted that prior to constructing and operating the road it would evaluate current best practices for winter ice road operators in the Canadian Arctic and supplemental mitigation measures would be included within the next version of the Road Management Plan (FEIS, Volume 10, Chapter 14), including requirements for driver protocols and procedures for dispatching convoys.

Sabina further addressed Board uncertainty described within the 2016 Final Hearing Report regarding the consideration of potential noise and vibration impacts on humans at both the Goose and Marine Laydown Area camps. Sabina outlined its Noise Abatement Plan (FEIS, Volume 10, Chapter 18) and noted that it would implement a noise monitoring program during the operations phase and follow the applicable Mine Health and Safety Regulations. Within the FEIS Addendum, Sabina outlined measures such as locating accommodations facilities as far as reasonable from potential sources of noise and vibration and installing adequate insulation and noise barriers in the camps.

5.11.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, Health Canada (HC) commented on potential health effects from blasting due to the potential presence of actinolite, a type of asbestos, in the waste rock. HC suggested that if potential health risks due to airborne actinolite fibres are identified, measures to mitigate human exposure should be included in the relevant management plans and that the Territorial occupational health authority should be contacted. Within its response to the 2016 final written submissions, Sabina committed to enacting measures to mitigate human exposure and to contact the Territorial occupational health authority if actinolite is found to be present.

HC noted that the final version of the HC draft noise guidance document cited in the FEIS is expected to be published in 2016 and provided alternate references associated with assessments of noise exposure. In its response to the 2016 final written submissions, Sabina stated that it had consulted both references provided by HC and further used the recommended day-night sound level baselines for rural areas in its assessment (see Section 4.3: Noise and Vibration for further information).

During the 2016 Final Hearing, Community Representatives discussed potential risks to the health and safety of employees from grizzly bear access to the Back River mine site. Sabina noted that its first priority would be to employ management measures, such as containment measures, with regards to supplies and waste.[1048] A Community Representative discussed a site visit organized by Sabina to the Goose Property and commented on the existing accommodation tents and the potential safety concerns associated with wildlife encounters when employees have to walk outside to reach other buildings in the camp. Sabina noted that once the camp is constructed all buildings would be connected via corridors and employees would not need to go outside.[1049]

The general on-site health and safety of employees was further discussed by Community

[1048] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 830, lines 18-22.
[1049] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 939, lines 15-26.

Representatives, one (1) who noted that:

> *We are talking about a very sensitive area and no matter where you want to set up shop. I worked underground for ten years at Lupin, and I spent 8 or 10 months over in Diavik, the open pit scenario, and although they are two different approaches to the mining operation, safety is paramount in both situations. Orientation is important. The awareness of the workers is important. The assistance program is important. The environment is important.*[1050]

In response, Sabina discussed its safety record and emphasis on site safety, training, and preparation, including: provision of safety equipment and gear; protocols for individuals being out on the land; pre-employment training including task and job-specific training; mandatory WHMIS training; and first-aid training.[1051] Sabina further noted that as a round trip on the proposed winter ice road from the Marine Laydown Area to the Goose Property would take approximately 16 hours, it would run three (3) eight (8) hour shifts to break up loads, and drivers would be able to rest overnight at camps at either end of the road. Sabina noted that its estimates have been conservative and travel schedules would be adjusted once the road is operational; the safety of the drivers was highlighted as a priority.[1052]

During the supplemental Final Hearing, a Community Representative discussed potential on-site hazards and requested that Sabina "*please ensure that your workplace is safe and sound so that no harm comes to your employees. No accidents should be allowed. We have to ensure that you have proper signage for your employees and have signage saying that -- do not go beyond this point".*[1053] Within its response, Sabina noted the importance of on-site health and safety and that in addition to signage in multiple languages, communications and training would further be provided.[1054]

In response to a question raised by a Community Representative from Taloyoak, Sabina clarified that there would be a medical centre on site staffed with nurses and that serious injuries would likely be treated off-site, potentially through the use of a medevac.[1055]

5.11.3 Views of the Board

Within the 2016 Final Hearing Report the Board acknowledged concerns submitted by Health Canada regarding the potential presence of actinolite in waste rock. The Board continues to accept Sabina's commitment to enact mitigation measures and notify the Territorial occupational health authority, should actinolite be detected. As previously stated, the Board believes that Sabina's management and containment measures for on-site waste management to be adequate. However, the Board continues

[1050] H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1015-1016, lines 19-26 and 1-2.
[1051] B. McLeod, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1034-1035, lines 10-26 and 1-4.
[1052] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1271, lines 15-24.
[1053] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 694, lines 7-12.
[1054] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 696-697, lines 16-26 and 1-4.
[1055] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 709, lines 1-18.

to stress the importance of worker orientation to ensure on-site safety, as noted by Community Representatives during both Final Hearings.

During the 2016 Final Hearing, the Board raised additional questions related to worker safety. Sabina discussed proposed response measures that would be undertaken if drivers were on the winter ice road during blizzard conditions. Safety shelters stocked with supplies would be located along the route every 50 to 60 kilometres and vehicles would have enough fuel to keep heated in the event a driver could not make it to a shelter. As a 'last-case' scenario, Sabina noted that large equipment, such as a loader, would be used to rescue a driver. Sabina further clarified that weather would be monitored and road activities would be stopped if required, such as in white-out conditions.[1056] Other associated proposed safety precautions were noted to include the use of satellite phones and safety equipment.[1057]

During the 2016 Final Hearing the Board questioned Sabina on its proposed mitigation measures to reduce noise associated with the proposed camp and mining operations and whether those measures conformed to best practices. In response, Sabina outlined its proposed noise mitigation measures, including enclosing the generator sets, crushers, and grinding mills within buildings and employing mufflers or silencers on equipment. Sabina suggested that the main sources of noise (generator sets, processing plant, crushers, mills, and equipment) and associated mitigation measures were used to construct its noise model and to predict and measure effects.[1058] The Board also raised questions as to whether project-generated noise during the night would impact people in the vicinity of the mine site (e.g. a camp 100 miles away). Sabina responded that noise generation would be a continuous 24 hours per day and that noise abatement measures would not differ by time of day:

> *I mean, for -- for workers, you're trying to keep the camp a little bit further away from things like the gen set or the process plant so that they sleep better and that type of thing. But there isn't anything additional I would say that you would do for night other than something like that*.[1059]

It was further clarified that the closest known cabin to project infrastructure would be three (3) kilometres from the Marine Laydown Area (MLA). Sabina added that the proposed camp and operations at the MLA would not be in continuous operation and that there was a 'large hill' separating the MLA and the cabin. Sabina stated that the closest community was identified as Kingaok (Bathurst Inlet), approximately 30 kilometres from the Project.[1060]

The Board notes that as part of the FEIS Addendum, Sabina provided additional discussions to address the Board's concerns related to distance between shelters on the winter ice road and winter ice road operations. The Board acknowledges that the supplemental mitigation measures related to winter ice road operations provided by Sabina have added clarity regarding how worker safety would be

[1056] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 399, lines 3-12.
[1057] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1046, lines 18-25.
[1058] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing No. 12MN036 Transcript, April 25, 2016, p. 104, lines 2-22.
[1059] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing No. 12MN036 Transcript, April 25, 2016, p. 105, lines 11-16.
[1060] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing No. 12MN036 Transcript, April 25, 2016, pp. 105-106, lines 20-26 and 1-8.

considered along the winter ice road, and gives the Board increased confidence in the Proponent's ability to manage unfavourable conditions that could be encountered in the project area.

In the FEIS Addendum and the supplemental Final Hearing, Sabina also addressed the Board's concerns about the potential noise and vibration impacts on humans at both the Goose and Marine Laydown Area camps. The Board notes that as a result of the additional clarity provided around Sabina's Noise Abatement Plan, noise mitigation measures, and its commitment to monitor noise during the operation of the Project, the Board has increased confidence that Sabina will adequately mitigate noise and vibration impacts on humans at the project sites

5.11.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board expressed uncertainty regarding the Proponent's consideration of potential impacts related to human health and safety. Following a review of the new material presented by Sabina in the FEIS Addendum and the supplemental Final Hearing, and discussion between parties, the Board believes that the Project's potential effects related to human health and safety could be appropriately managed through the commitments provided by the Proponent and application of the following key mitigation measures (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- If airborne actinolite fibres are identified, enacting measures to mitigate human exposure and requiring contact with the Territorial occupational health authority;
- Requiring that a comprehensive site orientation plan be in place for all employees and that all worker site-orientation, training presentations, and materials are regularly updated and reflect updates to management plans; and
- Ensuring that relevant management plans consider worker safety during winter ice road operations, particularly during periods of adverse weather conditions, and ensuring that updates are made to ensure plans are consistent with best management practices for similar ice road projects.

6 OTHERS MATTERS TAKEN INTO ACCOUNT

6.1 HUMAN HEALTH AND ENVIRONMENTAL RISK ASSESSMENT

6.1.1 Views of the Proponent

Sabina presented the results of its Environmental Risk Assessment (ERA) and Human Health Risk Assessment (HHRA) in Volume 8, Section 6 of the FEIS. Sabina conducted a risk assessment of the potential for project-induced effects on the environment and/or human health due to contaminants of potential concern (COPCs) through the ERA and the HHRA, respectively. Sabina determined that the Back River Gold Mine Project (Back River Project or the Project) would not contribute negatively to overall environmental and human health. It was further anticipated that potential effects would be not significant and that there would be no anticipated project-induced residual, cumulative, or transboundary effects.

Sabina stated that its ERA and HHRA adhered to the basic principles of risk assessment frameworks established within guidance provided by Health Canada, the Canadian Council of Ministers of the Environment (CCME), and the United States Environmental Protection Agency. Sabina noted that it had used risk assessment to characterize the nature and estimated magnitude of potentially adverse environmental and health effects from project-related contaminant emissions that could be present at concentrations exceeding guidelines, standards, or site-specific baseline conditions. It was outlined that the following three (3) criteria must be present for a COPC to pose a potential risk to environmental or human health:

- Potential for emissions or release of COPCs at sufficiently high concentrations to cause toxicological effects;
- Receptor(s) must be present; and
- There must be existing pathway(s) for COPCs exposure by receptor(s) and the receptor(s) must be able to take up the COPC.

Sabina noted that it had undertaken a five (5) step process when conducting the ERA and HHRA: problem formulation; exposure assessment; effects assessment; risk characterization; and uncertainty analysis and data gaps.

Sabina noted that for the purpose of the ERA and HHRA, mitigation measures and management strategies as outlined in relation to individual valued ecosystemic components (VEC) (i.e., as described in the Air Quality Monitoring and Management, Noise Abatement, Wildlife Mitigation and Monitoring, and Aquatic Effects Management plans) were considered to have been implemented and successfully minimizing/eliminating potential effects. Sabina noted that some potential Project-induced atmospheric emissions were excluded from consideration as COPCs, including volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAH), dioxins, and furans. Sabina predicted that use of controlled incineration technology would substantially reduce the potential contaminant exposure to the identified VOCs and proposed an Incineration Management Plan. Sabina stated that VOCs were not included in the ERA or HHRA assessments as there are no standards or objectives for ambient VOC concentrations in Canada and that the Proponent predicted that project emission levels would be minimal. Sabina outlined proposed mitigation and management measures for non-metal COPC, including fuels, other

petroleum products, and hazardous substances. Details, including storage, handling, and clean-up of potential spills, were provided within the following management plans, available in Appendix 10 of the FEIS: Fuel Management, Spill Contingency, Oil Pollution Emergency, Mine Waste Rock Management, Waste Management, Hazardous Materials Management, Explosives Management, and Shipping Management.

Environmental Risk Assessment

The following four (4) spatial assessment boundaries were identified for the ERA:

- *Project footprint:* All physical structures and activities that comprise the Project as specified in the project description (see Section 2.2: Project Description).
- *Potential Development Area (PDA):* includes the project footprint plus an unspecified buffer area.
- *Local Study Area (LSA):* Where there is a reasonable expectation of immediate impacts from the Project activities on valued environmental and socio-economic components and incorporates the PDA and a buffer.
- *Regional Study Area (RSA):* A broader area where there is a potential for direct, indirect, or cumulative environmental or socio-economic impacts and includes lands, waters, and potentially affected communities in the Nunavut Settlement Area.

The temporal boundaries were defined by each project phase (mobilization and construction, operation, reclamation and closure, post-closure monitoring, and potentially temporary closure and care and maintenance). Sabina focused on the construction and operations phases for all selected VECs, except when assessing potential effluent related effects in Goose Lake post-closure.

Using applicable legislation, concerns expressed during community and regulatory consultations, Traditional Knowledge shared, and the potential for impacts, Sabina identified the following VECs and subject of note as potential exposure pathways for the ERA:

- air quality;
- marine and freshwater quality;
- marine and freshwater sediment quality;
- soil (subject of note);
- vegetation; and
- noise.

Sabina identified two (2) main pathways for contaminants to enter the environment: airborne emissions (e.g., criteria air contaminants and fugitive dust) and liquid emissions (e.g., effluent discharge and site runoff). A pathway analysis was conducted to consider and screen linkages between predicted project-induced airborne or liquid emissions and potential effects to the health of wildlife, fish and aquatic habitat, and fish communities.[1061] Sabina considered the potential exposure routes of ingestion, gill uptake, and dermal contact for aquatic receptors (fish and aquatic habitat and fish communities), and ingestion pathways for terrestrial wildlife.

[1061] For additional information, please see the respective sections as pertains to each VEC or VSEC.

Sabina then undertook a screening approach for the terrestrial and aquatic receptors to identify COPCs, which consisted of the following steps: baseline screening, relative toxicity potency screening, bioaccumulation check, and effluent screening for Goose Lake. As a result, 27 COPCs (trace metals, nitrite, and cyanide compounds) were identified within the terrestrial, freshwater, and marine environments for the ERA. Sabina then used predictive modelling of each identified receptor to calculate the potential project-related exposure to COPCs, including: metal concentrations in air; waterborne emissions in Goose Lake; airborne emissions (dustfall) from road construction, maintenance, transport, and materials storage; sediment quality in Goose, Rascal, Fox, and Big lakes; marine water and sediment quality; increase in soil metal concentrations; and vegetation concentrations of metal. Sabina identified many uncertainties with regards to the ERA, particularly related to modelling, as well as sample collection, laboratory analysis, predicting exposure point concentrations, and estimating potential exposure of VECs. It was stated that where uncertainties existed, an effort was made to undertake a conservative approach to over predict rather than underestimate potential exposures and related risks.

A screening level ecological risk assessment (SLERA) was then conducted on the 27 COPCs identified. Through the SLERA, Sabina assessed whether the predicted concentration of COPCs, in addition to baseline conditions, would exceed applicable guidelines and existing baseline concentrations.[1062] COPCs that exceeded the 95th percentile baseline concentration, and either exceeded available guidelines or were there were no applicable guidelines, were assessed further. Through the SLERA, Sabina did not identify any project-related COPCs, including metals, that it considered would pose a risk to aquatic life or terrestrial wildlife VECs using or foraging in the freshwater, marine, or, terrestrial environments of the terrestrial or aquatic LSAs. Consequently, the Project was considered to pose negligible potential risk on the health of fish and aquatic habitat, fish communities, wildlife, migratory birds, and raptor VECs. Sabina considered potential risks to aquatic life in Goose Lake to be low and unlikely to cause adverse effects. Sabina predicted that lake-wide concentrations of arsenic would meet the CCME freshwater quality guidelines for the protection of aquatic life and that as a result, toxicity to aquatic life would be unlikely. Sabina considered that population level effects to the VECs using Goose Lake (specifically to wildlife feeding on fish) would be unlikely due to the large home ranges for piscivorous VECs (those wildlife that feed on fish) as well as the amount of lakes providing sources of fish and other food items (for more information see Section 4.9: Freshwater Aquatic Environment).

Human Health Risk Assessment (HHRA)

Sabina outlined that the main pathways through which human health could be affected by the environment would be air, drinking water, and consumption of country foods.

Sabina noted that it had incorporated Traditional Knowledge provided by the Kitikmeot Inuit Association Traditional Knowledge report for the Back River Project[1063] to establish the following two (2) spatial assessment boundaries for its HHRA, as well as its effects assessment on the Country Foods Valued Socio-economic Components (VSECs):

- *Local Study Area (LSA)* – The LSA encompassed the PDA of the Goose Property, plus a 10 kilometre (km) buffer; Marine Laydown Area (MLA) plus a 3.5 km buffer; and the main winter ice

[1062] FEIS, Volume 8, Figure 6.4-10, p. 6-74.

[1063] Kitikmeot Inuit Association. (2012). Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP). Prepared for Sabina Gold & Silver Corp. by Kitikmeot Inuit Association: Kugluktuk, NU.

road access corridors plus a one (1) km buffer.

- *Regional Study Area (RSA)* – The RSA was defined as the same for the assessment of wildlife and was based on the expected use of the region by wildlife species assessed as valued ecosystemic components (VECs). The RSA extended 35 km from the Goose Property, MLA, and the main winter ice road access corridors.

The temporal boundaries were defined by each Project phase (mobilization and construction, operation, reclamation and closure, post-closure monitoring, and potentially temporary closure, and care and maintenance phases). As the operation phase was considered to have the highest potential for project-related air emissions/effects on human health, Sabina focused its analysis of potential human health effects related to air quality, drinking water quality, and quality of country foods on this phase. However, a separate evaluation was conducted regarding effluent and water discharge from the water management features at the Goose Property; due to liquid emissions (e.g., effluent discharge), the post-closure phase within Goose Lake was considered to represent the worst case scenario for potential water quality effects.

Sabina stated that the Project could potentially result in direct or indirect adverse effects to human health through all project phases. In addition, the inclusion of human health into the Canadian ERA process was noted to be mandated by the federal government. It was further noted that the physical component of human health was considered in the HHRA as the physical health of humans living in or travelling through the project area who could potentially be directly affected through either biochemical pathways (e.g., contaminants in water, air, or country food) or biophysical pathways (noise).[1064] Radiological effects and electric/magnetic field effects were not considered in the HHRA, as Sabina did not expect the Project would alter radiological, electric, or magnetic levels. Sabina considered humans to be the only receptors for the HHRA and included the following VECs or VSECs as potential pathways to affect human health:

- air quality;
- water quality (in the context of drinking water);
- country foods consumption (which included consideration of water, soil, and vegetation quality); and
- noise.

The two (2) main pathways for contaminants to enter the environment were identified as airborne emissions of criteria air contaminants (e.g., dust, particulates, and gases) and liquid emissions (e.g., effluent discharge and site runoff). A pathway analysis was conducted to consider and screen linkages between predicted Project airborne or liquid emissions and potential effects to people. Sabina considered the potential exposure routes of project-related emissions for humans via ingestion, inhalation, and dermal contact. It was clarified that while dermal contact was generally considered only in relation to exposure of children, children were not expected within the HHRA LSA. Sabina noted that dermal contact as a route of exposure was not included in the HHRA as it did not consider dermal exposure to COPCs to represent a significant health risk in adults due to limited expected contact with soil and water.

For the HHRA, it was assumed that people who frequent the LSA and RSA, including Inuit, residents, and

[1064] Sabina's assessment of potential noise related effects is discussed further in Section 4.3: Noise and Vibration.

tourists, were potential receptors. Activities or locations outside of the LSA or RSA were not considered within the HHRA, as the potential for project-related effects to human health outside of these areas was considered negligible.

Sabina conducted a screening approach to identify COPCs for the HHRA, which consisted of the following steps: baseline screening and bioaccumulation check; relative toxic potency screening; screening related to future conditions in Goose Lake; and criterial air contaminants screening, metals bound to particulate matter and gases.[1065] As a result, 24 COPCs (18 metals and six (6) criteria air contaminants) were identified for the HHRA. Sabina then used predictive modelling to calculate the potential project-related exposure of humans to COPCs, including: air quality and fugitive dust (primarily using a CALPUFF atmospheric dispersion model); waterborne emissions; contaminant concentrations in water due to airborne emissions (dustfall) from road construction in Fox and Big lakes; metal concentrations in soil due to atmospheric deposition (focus was on the Goose Property); and use of a bio-concentration factor to predict vegetation concentrations of metals.

A screening level human health risk assessment (SLRA-HH) was then conducted, with the primary focus on metals and criteria air contaminants (carbon monoxide (CO), nitrogen oxide (NO_2), sulphur dioxide (SO_2), respirable particulate matter ($PM_{2.5}$), and particulate matter (PM_{10})), as other chemicals expected to be used or present during project activities were considered unlikely to have an effect on human receptors after the implementation of mitigation and management measures. It was noted that while metals naturally occur in the environment (e.g., water, soil, and vegetation) due to local physical and geological processes, baseline concentrations could potentially change due to project activities resulting in deposition of dust containing metals or effluent discharge containing metals. In the first step of the SLRA-HH process, Sabina assessed whether the predicted concentration of COPCs, in addition to baseline conditions, would exceed applicable guidelines and existing baseline concentrations. Hazard quotients (HQs) were then calculated by dividing the baseline plus potential Project concentration of the COPCs by the guideline limit in each relevant media. COPCs with a HQ of less than one (1) were screened out of the HHRA, as Sabina did not expect these COPCs to cause adverse effects in human receptors. Sabina considered a HQ value of less than or equal to one (1) at the receptor location a strong indicator of negligible health risks resulting from potential exposure to a particular COPC. COPCs that exceeded the 95th percentile baseline concentration, and either exceeded available guidelines or where there were no applicable guidelines, were assessed further.

Country Foods

Country foods were noted to include animals, plants, and fungi used by humans for nutritional or medicinal purposes and harvested through hunting, fishing, or gathering activities. It was stated that the quality of the following seven (7) country foods representing seven (7) different groups were estimated prior to development of the Project: caribou (large terrestrial mammals), Arctic ground squirrel (small terrestrial mammals), Canada goose (bird species), lake trout (fish), bay mussel (shellfish species), ringed seal (marine mammals), and bog cranberries and blueberries (berries). Sabina further noted that wherever possible, the country foods and species with the highest consumption frequency were selected.

Sabina stated that people obtaining country foods by hunting, trapping, collecting berries, mushrooms, and medicinal plants from the country foods LSA, and/or by fishing inside and downstream of the

[1065] The results of the bioaccumulation checks for terrestrial and aquatic receptors were provided in Appendix V8-6A: Ecological Risk Assessment and Goose Lake Chemicals of Potential Concern Screening for the Project.

country foods LSA, could potentially be affected by the quality of the country foods they consume. It was further noted that Inuit whose main food source is from harvesting country foods are likely the most frequent users of the area, and were consequently the focus of the country foods assessment. Sabina noted that as the quality of country foods was considered dependent on the quality of the surrounding environmental media (i.e., air, water, sediment, soil, and vegetation), the potential for project-related effects to country foods quality was characterized based on the potential for changes in environmental media quality.

The temporal boundaries were defined by each Project phase (mobilization and construction, operation, reclamation and closure, post-closure monitoring, and potentially temporary closure, and care and maintenance phases). Sabina considered the operation phase to have the greatest potential for effects to country foods. It was noted that the operation phase would likely have the greatest potential for air emissions of potential contaminants that could affect the quality of country foods. Sabina stated that as it predicted concentrations of various metals to be higher during post closure monitoring, water quality during post closure monitoring in Goose Lake was also evaluated, relative to the potential for residual effects to country foods.

Potential effects to human health from changes in the quality of country foods were then considered. It was noted that potential toxicological effects to humans from contaminants that could be present in country foods would be dependent on multiple variables, including dosage, frequency of exposure, type of contaminant, and the developmental stage of the human receptor. Sabina proposed multiple mitigation and monitoring measures, which are outlined in further detail in the Air Quality Monitoring and Management, Incineration Management, Aquatic Effects Management, Site Water Monitoring and Management, Fuel Management, Ore Storage Management, Mine Waste Rock Management, Tailings Management, Oil Pollution Emergency, and Spill Contingency plans.

Sabina noted that for potential human health effects resulting from the presence of contaminants in country foods within the LSA, three (3) criteria must be met:

- Contaminants must be present in the country foods within the LSA at concentrations high enough that effects in humans may occur;
- Human receptors (consumers) must be present and hunt, harvest, or collect the country foods from within the country foods LSA; and
- The country foods collected from within the LSA must be consumed.

Sabina noted that two (2) of its proposed mitigation measures, including a no hunting policy for employees and private only use of the site roads and winter access roads, would decrease the potential for hunting, harvesting, or collection of country foods in the areas in close proximity to Project infrastructure. Furthermore, Sabina noted that it would implement a no fishing policy in Goose Lake during all project phases.

It was noted that as the areas closest to project infrastructure are the ones most likely to be affected by project emissions (e.g., from deposition of fugitive dust containing metals), the country foods that have the most potential to change in quality are less likely to be harvested or collected. Consequently, it was noted that the potential for effects on human health would be less likely, particularly in project employees. Sabina noted that although there were no permanent residents living in the LSA, some of the country foods consumed by Inuit in the region may come from the LSA. Consequently, additional

assessment was conducted to consider the potential for effects to human health due to changes in the quality of country foods. In Section 5.1 of the FEIS, Sabina discussed the potential for metals to bio-accumulate in organisms or to bio-magnify in food webs. Consequently, it was noted that information was collected on the bioaccumulation/bio-magnification potential of each metal of interest.

Sabina predicted that after successful implementation of proposed mitigation measures and management strategies, the potential for residual effects to the quality of country foods from non-metal contaminants – blasting residues, chemicals used in mineral processing, treated sewage effluent, fuels, oils, PAHs, dioxins, and furans – was considered to be negligible. Sabina further predicted that the potential for changes in country food quality resulting in adverse effects to human health would be unlikely. Sabina further predicted that the Project would result in no significant residual or cumulative effects to country foods, and as a result there would be no transboundary effects.

HHRA Conclusions

Using the results of the air quality assessment, Sabina concluded that all assumed maximum predicted concentrations of metals would be less than ambient air quality guidelines. Sabina predicted that some levels of air pollutants (CO, PM_{10}, SO_2, and NO_2) would exceed air quality guidelines at the Goose Property at the maximum point of impingement outside of the PDA, or at the accommodations camp. No exceedances were predicted at the MLA outside the PDA or at the accommodations camp. Based on further assessment of the predicted exceedances of CO, PM_{10}, SO_2, and NO_2, including potential frequency, and evaluation of other relevant guidelines or toxicity information, Sabina considered potential risks and the likelihood of exposure to these elevated concentrations to be low. Consequently, potential risks related to air quality were considered to be negligible to low. Sabina noted that assessment of drinking water quality in the LSA indicated limited potential for changes, relative to baseline concentrations, with the exception of Goose Lake for arsenic. Sabina predicted that arsenic concentrations at one (1) prediction site in Goose Lake would exceed the Canadian Drinking Water Quality guideline, and conducted further assessment. The likelihood of a person consuming enough water to exceed the guideline was considered low and the potential risks related to consumption of Goose Lake water was consequently considered to be low. Consumption risks associated with other lakes was considered to be negligible.

Through assessment of potential change to country foods within the LSA, through an evaluation of soils, vegetation and surface waters, Sabina predicted that future concentrations of metals, in addition to baseline values, would generally be within baseline ranges, and with an HQ of less than one (1). Sabina further predicted that any project-related increments would be generally small and relative to baseline values. Sabina concluded that where increments were predicted to be large (e.g., arsenic in surface waters in Goose Lake), and where HQs were greater than one (1), any associated risks related to consumption of country foods in the LSA would be low.

No specific additions were made to this section within the FEIS Addendum.

6.1.2 Views and Concerns of Interested Parties

Within its 2016 final written submission, Health Canada (HC) commented on Sabina's Human Health and Environmental Risk Assessment with regards to country foods. HC noted that HC's Guidelines for Lake Trout and Round Whitefish referenced in the FEIS only apply to retail fish and should not be used for assessing fish tissue used for subsistence consumption. HC also noted the methyl mercury Tolerable Daily Intake values to be used in HHRAs for adults, women of reproductive age, and infants. HC

recommended that a conservative approach be taken for the Human Health and Environmental Risk Assessment and that year-round consumption of freshwater fish be considered. HC concluded that it supported the implementation of a methyl mercury monitoring program to identify changes in concentrations of methyl mercury in fish and wildlife. Within its response to the 2016 final written submissions, Sabina noted that its assessment took into consideration that the values for Lake Trout and Round Whitefish used were for retail/commercial fisheries. Sabina further noted that baseline values for fish consumption took into account the remote location of the country foods local study area relative to communities and the resulting assumption that fish from this area would not be consumed year-round. Sabina noted that while increased consumption of fish is a plausible scenario, fish would likely come from a variety of areas outside of the LSA and any associated increases in risk quotients, which were developed from baseline levels, would not be directly attributable to the Project. Sabina re-stated its conclusions that additional project contributions of mercury into the aquatic environment would be negligible. It was noted that fish tissue would be monitored for methyl mercury through the proposed Aquatic Effects Management Plan.

During the 2016 Final Hearing, Community Representatives from the Northwest Territories raised concerns regarding general potential health associated risks to consumption of wildlife that could potentially be impacted by mining development, noting that:

> *And the elder lady [sic] had a concern of his land. He was crying. He can't eat fish. Even you shoot the caribou or moose, doesn't taste right they said. Now we have one of the Elders from Yellowknife and the First Nation and the mine in their area and you hear people talking in the radio concerning about the Yellowknife area. It used to be a good place for blueberries and all kinds of things that were I don't and now that you can't drink or hunt in their area maybe from 45 miles out of Yellowknife. You can't go hunting.*[1066]
>
> *There's some chemical that went on the land and the air maybe, even mosquito that lands on our skin, we're afraid that's what is going to happen to us. If we will eat moose, wildlife, we're kind of afraid. We're really caution what we eat that what's going to happen to our body.*[1067]
>
> *… and for those of us that know this, before mineral exploration started happening, they -- we have taken notice that animal behaviour has changed drastically. And our elders have told us. We notice that some have noticed that the meat of the game that we catch has changed. Some have -- have joints that have been infected. It's very noticeable. When elders eat them, they tell us right away that there have been changes to the meat that -- that's been hunted for consumption. Even though they don't have any – they haven't done studies they notice that and have you -- has the company taken any notice of this as well?*[1068]

The Government of the Northwest Territories (GNWT) further discussed concerns raised regarding potential contamination of country foods and noted that:

[1066] C. Football, Wekweètì, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 1023-1024, lines 20-26 and 1-5.

[1067] M.L. Rabesca, Behchokǫ̀, Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1038, lines 11-16.

[1068] S. Hiqiniq Sr., Gjoa Haven, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1053, lines 5-17.

… in terms of the Canadian north, the monitoring that's been done and it goes back many years now, basically shows there are contaminants but at very low levels, and essentially not -- not at levels that would be a concern for hunters and people who depend on caribou.[1069]

During the supplemental Final Hearing, Community Representatives expressed concern with potential changes to country food, noting

We have to ensure that wildlife is protected, including caribou, wolf, grizzly bears, wolverines, fish, anything that we live off of.[1070]

I recall the country food that we lived off of was much -- much healthier. They - the -- the meat that we ate was more tender. And maybe perhaps it's due to climate change or animal behaviour. We don't know. But when we consume and eat country food, the texture is different. That's the one thing that I've noticed. I'm not saying it's bad. It's just an observation that I've made.[1071]

So the -- since last five, six years, I guess, you know, that the populations of Bathurst herd had dropped so -- so low that today, I guess, is practically banned for most of the people that rely on the country food from the – especially the caribou. So the – - we as Aboriginal people, I guess, you know, like, we know that we're interested the economy of the country, but, nonetheless, we're mostly – our priority is always the wildlife and the -- you know, what's in the water and what's across the -- the water is very important as well too.[1072]

So some hunters, I guess, that the -- that were out -- there's one hunter that -- that preparing some meat after the hunt, I guess, on -- without a rubber glove. But, nonetheless, that there are some – some sores that came along to this individual person that was preparing meat because of that -- I don't know how this disease got into the animal, but I hate to blame the mining companies, but, nonetheless, there's some things that are learned -- to be learned from, activities taking place. … But, nonetheless, that -- but I went to see the medical attention. Then I was trying to ask compensation from the -- from the company or even from the government, and I haven't got anywhere. So -- so what kind of expectation that it might have from the wildlife, you know, dealing with -- regarding the mining operations?[1073]

Within its responses to the above statements, Sabina discussed the need to ensure that country foods are accessible and safe to consume. The Proponent further noted its commitment to monitoring various components that could impact country foods, such as dust emissions and water quality, and further referenced Sabina's Human Health and Environmental Risk Assessment completed for the FEIS and

[1069] J. Adamczewski, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1284, lines 3-8.
[1070] D. Totalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 693, lines 24-26.
[1071] S. Oleekatalik, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 699, lines 7-14.
[1072] J. Judas, Behchokǫ̀, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 725, lines 12-23.
[1073] C. Football, Wekweètì, Northwest Territories NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 735-736, lines 18-26, 1, and 7-13.

conclusions that all country foods, including fish, would be safe to consume.[1074]

During the supplemental Final Hearing, multiple Community Representatives from Behchokǫ̀, Northwest Territories discussed the mining and milling processes used at the Giant Mine and resulting arsenic levels and identified impacts to community members and wildlife (for further discussions see sections 4.1: Air Quality, 4.7: Groundwater and Surface Water Quality, 4.11: Terrestrial Wildlife and Wildlife Habitat. In response to a question on how Sabina would address arsenic produced through processing, Sabina noted that arsenic is naturally occurring in the rock at the project site, but would not be added during its process. Sabina further described various processes that could produce arsenic trioxide, a toxic substance, and emphasized that the process that would be used for the Project differs from that used at the Giant Mine Project and that arsenic trioxide would not be produced as part of the proposed processes at the Back River Project.[1075]

The Community Representative further discussed potential impacts to human health as a result of mining practices

> *…if we look in our community, most of our community within our region, people get such disease as cancers that we've been hearing too many of that within our region, I guess. A lot of people feel that maybe has something to do with the mining companies such as Yellowknife and the uranium mines that have been operated within the past within our area. We don't hear too much of that around here, but, nonetheless, we got to think about safety of the -- the -- the workers and the -- the health of the human beings within the area and the -- so – so although I'm not from this part of the region, but, nonetheless, I thought I'd give you some comments about, you know, past history about what we had to go through within our region of -- for the -- in the past.*[1076]

6.1.3 Views of the Board

As previously noted, the Board acknowledges that throughout the Review of the Project, concerns were expressed by both Health Canada and Community Representatives regarding the potential for health risks associated with the consumption of country foods that could potentially be impacted by mining development. During the 2016 Final Hearing the Board also questioned Sabina on potential impacts to wildlife drinking water from the Tailings Storage Facility. Through a deferred response, Sabina discussed the Human Health and Environmental Risk Assessments conducted to assess potential risk as relates to country food. Sabina noted that the study assessed both water quality in ponds as well as lakes and incorporated potential uptake of dust by wildlife through consumption of vegetation. Sabina re-iterated the conclusion in the FEIS that there would be no effects, specifically from the tailings water.[1077]

There were no updates to this part of the FEIS in the FEIS Addendum. Based on the input provided by

[1074] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 696, lines 9-15 and p. 700, lines 1-18.
[1075] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 721-722, lines 6-26 and 1-15.
[1076] J. Judas, Behchokǫ̀, Northwest Territories, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 727-728, lines 18-26 and 1-6.
[1077] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1105, lines 15-17.

parties, Community Representatives, and the Proponent throughout the Review of the Project the Board is confident that the potential risk from project operations on human health, particularly dust deposition and associated impacts to wildlife can be mitigated, provided that the Proponent fully implements the mitigation and monitoring measures proposed in various management plans.

6.1.4 Conclusions and Recommendations of the Board

In considering the views of the Proponent and those of parties throughout the assessment of the Project and as outlined above, the Board is satisfied with the Proponent's effects assessment related to human health and environmental risk assessment, and the mitigation and monitoring measures proposed during the NIRB's Review process and committed to throughout subsequent collaboration. The Board has not recommended specific terms and conditions in relation to human health and environmental risk as the Board is confident that the potential for project-induced effects has been adequately addressed by the mitigation and management measures proposed by the Proponent, terms and conditions applicable to limiting a variety of other potential project-induced effects such as measures associated with preventing impacts to air, water, vegetation, terrestrial wildlife, etc..

6.2 ACCIDENTS AND MALFUNCTIONS ASSESSMENT

6.2.1 Views of the Proponent

Sabina presented its assessment and proposed mitigation measures with regards to accidents and malfunctions in Volume 9 of the FEIS. The potential accidents and malfunctions related to potential human risk are discussed in Section 5.11: Human Health and Safety.

Accidents and Malfunctions

There were three (3) general sources of accidents and malfunctions identified within the FEIS: release of substances into land or water, fire, and ship based accidents. Sabina noted that accidents and malfunctions could occur during any phase of the mine life and identified the primary environmental concern as the possibility for spills and/or release of chemicals, reagents, petroleum products or process materials onto the land or into water. Fire was identified as a potential risk resulting from vehicle accidents, damage to electrical systems, or accidental explosions. The potential for ship damage through collision with other vessels, or harm to aquatic life and the coastal environment through possible diesel spills from grounding along the shipping route, were further identified.

Within its accidents and malfunctions assessment, 19 of the potential major accidents and malfunctions Sabina identified were primarily related to the natural environment. Sabina's process for identifying and managing risk was to identify hazards, assess the risk, evaluate existing controls, implement additional risk controls if required, and monitor and review. The identified risk assessment methodology consisted of the following four (4)-step process:

1. Identify all possible natural and human-made hazards.
2. Evaluate the frequency (probability) – The degree of risk posed by each potential hazard, rated as rare, unlikely, possible, likely, or almost certain.
3. Evaluate potential consequences (severity) of the identified risk, rated as insignificant, minor, moderate, major, or critical.
4. Evaluate the potential risk for each hazard and select an associated risk category based on

probability and consequences, rated as very low, low, moderate, high, or extreme.

Sabina applied a low and moderate risk rating to potential major accidents and malfunctions identified as summarized in Table 5:

Table 5: Accidents and Malfunctions

Low	▪ collision with other vessels ▪ site all-weather roads embankment failure and/or collapse of a water crossing ▪ open pit mine flooding ▪ waste rock storage area stability	▪ failure of sewage treatment plant ▪ failure of cyanide destruction process ▪ introduction of invasive terrestrial species
Moderate	▪ diesel spill ▪ fuel spill along shipping route ▪ fuel spill during ship-to-shore transfer of fuel ▪ ship grounding ▪ release of ammonium nitrate or other explosives ▪ spill of hazardous materials ▪ tailings pipeline leakage	▪ extreme storms overtopping and washouts in the tailings storage facilities (TSF) and tailings facility (TF) embankment ▪ seepage from the TSF ▪ saline water pipe leakage ▪ extreme storms overtopping and washouts of the Saline Water Pond embankment ▪ introduction of invasive marine species

For each identified low risk rating, excluding collision with other vessels, the consequences and likelihood were considered minor and unlikely, respectively. While the potential consequence of a potential collision with other vessels was considered to have major consequences, the likelihood of an event was considered rare. Sabina noted that protocols were well established for shipping in the Arctic, and that mitigation measures would include communication between vessels and the use of surveillance systems and anti-collision devices. Relative regulations and detailed measures were included within the Shipping Management Plan, available in Volume 10, Part 15 of the FEIS. Sabina proposed multiple measures related to best engineering practices, design, and routine inspection and maintenance to mitigate potential effects associated with the other potential hazards considered to be of low risk. More detailed procedures related to potential failure of the sewage treatment plant were detailed within the Spill Contingency, Site Water Monitoring and Management, and Waste Management plans, available in Volume 10, Parts 4, 7, and 10.

Sabina considered the different types of potential spills and release of hazardous materials identified above to have potential consequences varying from minor to major, and unlikely, likely, and possible likelihoods. Sabina identified multiple applicable federal and territorial Acts and regulations and included detailed mitigation and response procedures within the Spill Contingency, Oil Pollution Emergency, Fuel Management, Shipping Management, and Risk Management and Emergency Response plans. The Oil Pollution Emergency Plan outlined procedures for ship to shore transfer, training requirements for personnel, and required emergency response equipment. The storage and handling of explosives and hazardous materials were detailed within the Explosives Management and Hazardous Materials plans, respectively.

Sabina identified natural and engineered controls in place to ensure the tailings storage facility (TSF) and

tailings facility embankments (TFs) do not overfill. It was noted that the design, construction, operation, and monitoring of dams, including tailings dams, would be completed in accordance with appropriate Provincial and Federal regulations and industry best management practices. Sabina noted that if the TSF or a TF becomes close to overtopping throughout operations, the excess water could be managed by increasing reclaim flow to the Goose Process Plant by temporarily storing excess reclaim in alternative storage facilities, or through emergency pumping if required. As part of closure activities, the TFs would be intentionally overtopped once discharge requirements were met then permanently covered with waste rock cover. Sabina considered it unlikely, given these preventative measures, that a TSF or TF could overflow; as such it applied an associated risk rating of moderate. Specific mitigation measures for potential seepage from the TSF would include the use of berms and impermeable liners and discharging to water to the environment as appropriate.

Sabina considered it possible that shipping activities could introduce invasive marine species in the southern Bathurst Inlet area with ballast water.

Overall Mitigation and Monitoring

Sabina's proposed risk mitigation measure included strategies to reduce the probability and consequences of any accidents and malfunctions (e.g., reinforcing structures, establishing increased setbacks from sensitive sites, and developing system redundancies). It was further noted that a systematic approach would be undertaken whereby health and safety objectives and performance targets would be established and documented. Action plans would be developed for each potential hazard classified as representing a priority risk. Other measures include: employee training programs, inspection and maintenance programs, emergency response, environmental monitoring, and adaptive management.

Sabina further discussed its assessment and proposed mitigation measures with regards to accidents and malfunctions in Volume 9, Section 3 of the FEIS Addendum under FHR-NIRB-6.2 (A) – Emergency Preparedness and Spill Response Capability for Shipping, Offloading, and Transporting Bulk Fuel and FHR-NIRB-6.2 (A) – Emergency Preparedness and Spill Response Capability for Shipping, Transport to Land, Transporting Over Land, and Regulatory Oversight. Sabina noted that it had provided additional information to address the conclusions in the 2016 Final Hearing Report that the Board had considerable uncertainty in relation to Sabina's capabilities to respond to spills in Bathurst Inlet, in the event that neither the shipper nor the Canadian Coast Guard (CCG) were in a position to respond.

Sabina provided information on its emergency preparedness and spill response capability with regards to shipping, fuel transfers to land, and transport over land. Sabina noted that its vessels would have a Shipboard Oil Pollution Emergency Plan and designated oil handling facilities would have an Oil Pollution Emergency Plan (OPEP), both of which would be required to be reviewed and approved by Transport Canada (TC). Sabina provided an updated OPEP, Fuel Management Plan, and Spill Contingency Plan within the FEIS Addendum. The updated OPEP included additional details pertaining to the following topics:

- Bulk fuel transfer spill prevention measures;
- Marine mammal and fish sensitivities;
- Spill response kit locations at the Marine Laydown Area (MLA);
- Guidelines for responding to multiple emergencies; large spills; and
- Unexpected ice conditions.

Several preventative measures to minimize the risk of spills during bulk fuel transfer were added to the OPEP. Sabina further developed and presented additional management plans relating to the prevention of or response to any spill within its Risk Management and Emergency Response, Fuel Management, Spill Contingency, Oil Pollution Emergency, and Shipping Management plans.

Sabina further highlighted the expertise, jurisdiction, and mandate of TC and the CCG pursuant to the *Canada Shipping Act* and noted the responsibilities of other federal agencies and departments for the management of marine transportation safety and environmental protection in the Arctic.

During the supplemental Final Hearing, Sabina clarified during its presentation on accidents and malfunctions that the one (1) to two (2) ships transporting fuel for the Project per year would be double-hulled and would travel along established shipping routes.[1078] Sabina further noted additional commitments made, including: caching additional marine supplies and response equipment in Bathurst Inlet; offering marine fuel response training opportunities for Burnside Hunters and Trappers Organization members; and joining the Mackenzie Delta Spill Response Corporation (MDSRC) prior to construction of the fuel tanks at the MLA. Sabina noted that as a result of TMAC Resources Inc. joining the MDSRC, the corporation will be stationing a response boat in Cambridge Bay. Sabina added that as a member of the MDSRC, it would have access to specialized marine spill training as well as spill response equipment stored in various communities in the Northwest Territories.[1079,1080]

Sabina also noted during the supplemental Final Hearing that, pending project approvals, the first vessel could travel through Bathurst Inlet in August 2018, or earlier, and that community representatives from Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) would be asked to monitor the first voyage.[1081]

6.2.2 Views and Concerns of Interested Parties

The Government of Nunavut (GN) commented on potential impacts to polar bears from potential spills along the proposed shipping route and noted that limited information was provided in the FEIS on the risk of potential major spills, including location, type, volume, extent of spill, and spill response times. The GN indicated that although some discussion on spill responses for oiled birds and other small wildlife were provided within the Oil Pollution Emergency Plan (OPEP), there was no discussion on plans in association with large mammals, such as polar bears. The GN recommended that Sabina update the Wildlife Mitigation and Monitoring Plan (WMMP) to include provisions for dealing with polar bears affected by fuel spills in the marine environment.[1082] Within its response to the 2016 final written submissions, Sabina noted that within the Shipping Sensitivity Report, the population and distribution of polar bears along the proposed shipping route was outlined to identify areas where there would be greater risk to polar bears should an oil spill occur. During the 2016 Final Hearing Sabina noted that it agreed with the GN's recommendation and committed to updating its WMMP to include provisions for

[1078] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 378-379.
[1079] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 383-384, lines 21-26 and 1-17.
[1080] Sabina Gold & Silver Corp., Exhibit 39, NIRB supplemental Final Hearing File No. 12MN036, June 1, 2017.
[1081] M. Pickard, Sabina Gold & Silver Corp. NIRB supplemental Final Hearing Transcript, June 2, 2017, p. 807, lines 13-23.
[1082] Government of Nunavut, 2016 Final Written Submissions, March 7, 2016.

addressing polar bears potentially impacted by fuel spills within the marine environment.[1083] The GN noted it was satisfied with the response.[1084]

Within its 2016 final written submission, Environment and Climate Change Canada (ECCC) commented on shipping-related response preparedness in the event of an oil/fuel spill and recommended that Sabina revise its OPEP to mitigate potential impacts to migratory birds. Within its response, Sabina committed to: ensuring the equipment necessary to initiate wildlife protection measures as outlined in the OPEP would be made available on-site; updating the ECCC – Canadian Wildlife Service's contact information; and providing the Shipping Sensitivity Report, relevant wildlife protection measures, and a list of equipment to the shipping contractor prior to commencement of shipping activities. During the 2016 Final Hearing, ECCC indicated that it had no outstanding concerns with this commitment.[1085]

Within its 2016 final written submission, Transport Canada (TC) further commented on the *Draft* OPEP as provided in the FEIS and noted that with a few additions it would comply with the *Canada Shipping Act, 2001.* Within its response, Sabina agreed to update the OPEP with the requested information related to authorized personnel, staff training, NT-NU spill report document, and to incorporate any additions or changes to the operation. During the 2016 Final Hearing, TC clarified that the Marine Laydown Area Oil Handling Facility would be required by regulations to have an approved OPEP.[1086] TC further noted that Sabina committed to providing a revised marine shipping plan during the regulatory phase that would include regulatory and compliance details as well as a revised OPEP, and stated that it had no concerns.[1087] TC also clarified the respective roles of TC and the Canadian Coast Guard in response to a marine spill:

> *If the polluter is unwilling or unable to respond or is unknown, the Canadian Coast Guard takes the lead in responding to ship source pollution on behalf of the Government of Canada. During our response Transport Canada could be asked to provide essential information to the Canadian Coast Guard regarding vessel stability and integrity which may assist in determining the risk of pollution posed by a vessel.*[1088]

Within its 2016 final written submission, Indigenous and Northern Affairs Canada (INAC) commented on the proposed mine wastewater treatment plant and noted that it was unclear whether the treatment units would have capacity to deal with abnormal operating conditions, spills, accidents, and malfunctions. INAC recommended that Sabina provide further details and clarification on the proposed mine wastewater treatment plant(s), including design, treatment capacities, and proposed timing for each plant. Within its response, Sabina referred to the Water and Load Balance Report as provided in the FEIS and outlined the capacity, timing, and target constituents for the treatment plants. During the

[1083] C. Kowbel, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 427, lines 9-21.
[1084] D. Baikie, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 428, line 1.
[1085] J.F. Dufour, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April, 26, 2016, p. 449, lines 11-25.
[1086] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 179-180, lines 26 and 1-3.
[1087] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 536, lines 11-26.
[1088] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 539, lines 17-26.

2016 Final Hearing, Sabina referenced additional discussions with INAC and committed to providing additional information on the proposed mine waste water treatment plants, including design details and the capacity of the treatment plants to address spills, accidents, and malfunctions as part of the Nunavut Water Board Type "A" Water Licence Application.[1089] INAC confirmed that this commitment would resolve the concerns as presented within its 2016 final written submission.[1090]

TC indicated within its 2016 final written submission that it had no concerns with the creation and/or upgrading of the two (2) registered aerodromes associated with the proposed ice and open water airstrips. TC further noted it had no concerns with the temporary ice airstrip proposed at the Marine Laydown Area (MLA) and they would be used by Sabina's pilots at their own risk. Within its response, Sabina reiterated that the proposed ice and open water airstrips would be built in accordance with Transport Canada's Aerodrome Standards and Recommended Practices (TP312).

A Community Representative from Kugaaruk requested clarification on the refuelling procedure for aircrafts and whether the refuelling would be completed in a bermed area. In response, Sabina noted that all fuel storage would require secondary containment and aircraft refuelling would take place on a lined and contained area that would keep any spilled fuel contained should a spill occur.[1091]

TC further commented within its 2016 final written submission on the proposed transportation of explosive materials within the FEIS and outlined recent amendments to the *Cargo Fumigation and Tackle Regulations* and noted that the regulations do not apply to ports. TC recommended that Sabina ensure the quantity of explosives material is within the limits established by individual ports, and that ship masters comply with notification requirements as prescribed in relevant guidelines. Within its 2016 final written submission, Natural Resources Canada (NRCan) further discussed the manufacturing and storage of explosives and noted that pursuant to the *Explosives Act,* Sabina, or its explosives contractor, would be required to submit applications for the explosives manufacturing and storage facilities associated with the Back River Project as part of NRCan's licensing process. Within its response to TC's 2016 final written submissions, Sabina noted that while ammonium nitrate would be shipped by sea, packaged explosives and detonators would not. It further clarified that blasting agents would not be mixed at the MLA. In written response to NRCan, Sabina further committed to submitting the required applications related to the manufacturing and storage of explosives as part of NRCan's licensing process.

TC further commented on the potential for barges, fuel vessels, or tugs to remain at the Bathurst Inlet over the winter period and noted that although there is no current plan for this to occur, should it become necessary, all regulations for overwintering would have to be met. In response to the written submission, Sabina committed to ensuring compliance with Transport Canada's current regulatory requirements and guidelines as stated in the *Guidelines for Over-wintering of Vessels Carrying Oil of NLS in Canadian Waters*, if over-wintering of vessels carrying oil would be required in the future. During its presentation at the 2016 Final Hearing, TC noted that Sabina has committed to provide the information

[1089] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 575-576, lines 19-26 and 1-5.
[1090] M. Sewchand, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 576, lines 9-10.
[1091] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 833, lines 7-13.

as requested and TC was satisfied with the commitment.[1092] During the 2016 Final Hearing, the NIRB requested clarification whether the regulatory requirements or guidelines apply to the overwintering of barges containing diesel fuel.[1093] TC confirmed that the *Guidelines for Over-wintering of Vessels Carrying Oil of NLS in Canadian Waters* would apply to over-wintering of barges containing diesel fuel.[1094]

The Burnside and Omingmaktok Hunter and Trapper Organizations (BHTO and OHTO) commented within their 2016 final written submissions on the proposed shipping route for the Project and noted that the Bathurst Inlet is narrow and expressed concerns related to difficulties in navigation and potential accidents, including ship wrecks and oil spills, from shipping activities. The BHTO and OHTO recommended that Sabina provide spill kits and oil spill emergency training to the communities of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) as well as the MLA. Within its response, Sabina outlined relevant shipping legislation and noted that TC and the Canadian Coast Guard would be responsible for imposing navigational requirements in terms of safety at sea, emergency responses on ships, crew qualifications, or other specialized requirements on shipping providers. Sabina added that the navigation routes proposed to Cambridge Bay are well known, have been in use for several decades, and that Canadian regulations require that fuel tankers navigating in Arctic waters be double-hull vessels. Sabina outlined its proposed spill prevention measures and related best practices and committed to meeting all regulatory requirements for shipping, including those included in the Shipboard OPEP. During the 2016 Final Hearing, Sabina clarified that the "*entire Northwest Passage does have a corridor mapped based on our discussions with the Canadian Hydrographic Services. … The bathymetry for the entire passage is sufficient to do shipping and that no additional work is required*".[1095]

During the 2016 Final Hearing, a Community Representative from Cambridge Bay expressed concern regarding the narrow shipping lane leading to the proposed MLA in Bathurst Inlet. In response, Sabina reviewed shipping regulations in Canada, TC's responsibilities for overseeing safe shipping in Canada, as well as their numerous meetings with the Canadian Hydrographic Services on the bathymetry of Bathurst Inlet and safe navigation. Sabina further noted that the individual captains of the ships would be accountable for choosing safe shipping routes and would be required to carry spill response equipment on-board, however, response equipment would also be stationed at the MLA.[1096]

A Community Representative from Kugluktuk noted concern regarding the shipping of fuel and the potential for accidents, such as the Exxon Valdez incident off of Alaska, and asked what Sabina's capabilities are with regards to major spill response. Sabina clarified that it would be shipping diesel and not heavy crude oil, like in the case of the Exxon Valdez spill, and that diesel is easier to remediate because it floats and behaves differently. Sabina further noted each vessel operator would be required to carry adequate spill response equipment, and further that Sabina would have equipment at the MLA that would be reviewed and approved by TC.[1097]

[1092] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 535-536, lines 25-26 and 1-4.
[1093] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 542, lines 3-13.
[1094] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 542, lines 15-16.
[1095] M Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 550, lines 4-6 and 13-15.
[1096] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 934-937.
[1097] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 992-993, lines 14-26 and 1-4.

During the 2016 Final Hearing, a Community Representative from Kugaaruk expressed concern with regards to potential fuel spills when fuel transfer would occur from ships to the MLA and as well as subsequent transport across the tundra. Sabina responded that it would be required to have an OPEP to ensure that it could respond to any incidents at the MLA, which would include appropriate spill response equipment at the MLA and within vehicles transiting the winter ice road.[1098]

During the 2016 Final Hearing, Board staff asked Sabina whether it had "*modelled the potential worst-case scenario for impacts to aquatic fish habitat from a fuel spill on the proposed winter roads[;]what specific mitigation measures would be implemented in such a scenario[*; and*] …whether such measures have been proven to be effective in other operations".*[1099] Board staff further asked what associated mitigation measures would be employed during such a scenario.

In response, Sabina noted that no specific incident models were completed over the entire winter ice road due to the amount of waterbodies along the proposed route and that the primary mitigation measure would be to design the truck to not rupture in the event of an accident.[1100,1101] Sabina further noted that it "*would be collecting additional information in water bodies, especially those which we will take water from, which could modify or - - or add areas of particular significance and focus"*.[1102] Board staff asked for further clarification on what response measures would be should a vehicle fall through the ice. Sabina responded noting that "*[t]he most common response is to use dykes or snow berms, commonly with plastic linings, or trenches to try to manage the snow"*[1103] as long as the vehicle has not gone through the ice. If the vehicle has broken through the ice, then the procedure would be to control the spill, remove the tanker if safe to do so, and then burn off hydrocarbons on the surface. Should hydrocarbons move under the ice, reclamation of the spill would continue through both drilling holes in the ice and monitoring for any visible contamination during the summer season.[1104]

If hydrocarbons were to enter a waterbody, Sabina noted that there would be various opportunities to either reclaim, "*access certain points if it's fairly contained and try to burn it off*"[1105], or monitor the hydrocarbons.[1106] Sabina noted that spills greater than 100 litres, particularly spills within "*fisheries type*" waters, would be reported to the GN spill reporting line and potentially to Fisheries and Oceans

[1098] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 960, lines 4-10 and 14-24.
[1099] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 385-386, lines 25-26 and 1-5.
[1100] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 386, lines 7-25.
[1101] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 146-147, lines 22-26 and 1-7.
[1102] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 387, lines 10-13.
[1103] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 388-389, lines 9-26 and 1-11.
[1104] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 388-389, lines 9-26 and 1-11.
[1105] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 389, lines 8-10.
[1106] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 389, lines 3-6.

Canada (DFO).[1107] Sabina further noted that it would continue on-going discussions with operators in the Northwest Territories and revise its management plans accordingly prior to the construction of the proposed winter ice roads.[1108]

Board staff further questioned Sabina on how the Proponent had determined that it would be unlikely for a fuel tanker to break through the ice on the winter ice road, as the frequency of an unlikely accident was considered to be between 100 and 1,000 years by Sabina. Board staff further noted that a fuel tanker recently broke through the ice on a winter ice road in the Northwest Territories. Sabina responded that although it determined the likelihood of such an accident as unlikely:

> *…by putting it in a -- a -- in that major category, that really puts it into the point where it would be so bad that that could actually have regulatory approval actually withdrawn completely from the project. So if you were to go to most of the incidents that have happened in the past, you would probably drop that severity down to "Moderate", and then that would increase your level of likelihood, still keeping it in that "Moderate" category overall.*[1109]

Sabina noted the ice along the proposed route for the winter ice road would be significantly thicker than most portions of the Tibbit-Contwoyto Road, two (2) metres or more, and many of the lakes are actually frozen right through to the bottom of the 51 waterbodies.[1110]

A Community Representative from Gjoa Haven expressed concern with regards to the proximity of accommodations to the fuel storage tanks at the Goose Property, and noted it could be quite dangerous should an accident or malfunction occur. Another Community Representative from Kugaaruk acknowledged that fuel storage includes double walled tanks located inside a bermed area; however, stressed that safety measures are important and questioned whether additional measures should be considered due to the fact that recovery of the environment in the cold climate would take a long time.[1111] In response, Sabina clarified that fuel storage locations would have to comply with federal regulations noting the importance of locating the tanks on stable and safe land with secondary containment.[1112] Sabina also noted that the tank farm would be located away from any waterbodies, would be surrounded by roads, and that it has detailed spill response procedures and equipment for any potential incidents on-site.[1113]

Board staff questioned TC and INAC on whether their mandates for road safety and the land use authorizations, respectively, would extend to the design and planned operations of the proposed winter ice road. TC noted that it would not have an associated regulatory role or oversight with regards to the

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[1107] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 389, lines 12-18.
[1108] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 388-389, lines 9-26 and 1-23.
[1109] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 391, lines 5-22.
[1110] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 391, lines 5-22.
[1111] M. Anguti, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 839, lines 8-11.
[1112] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 830, lines 5-15.
[1113] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, pp. 841-842, lines 7-26 and 1-8.

proposed winter ice road.[1114] INAC noted that the land use authorizations would apply to the proposed winter ice road, including portions crossing Bathurst Inlet.[1115] INAC further discussed details with regards to the its road inspections, noting that two (2) inspectors have been assigned to the Kitikmeot region and that the frequency of inspections would be dependent on the level of activity associated with the authorization granted. It was further stated that inspections can occur at any time of the year and inspectors could respond to any significant incidents associated with the Project, such as a spill.[1116]

During the 2016 Final Hearing, Community Representatives from Cambridge Bay and Gjoa Haven requested clarification on the proposed treatment of contaminated rain and snow on-site and how Sabina would prevent spills or leaks from vehicles on the winter ice road from contaminating the surrounding environment when the ice melts. Sabina explained how all rain and snow that would come into contact with the site would be collected as contact water into ponds and tested prior to release into the environment. Sabina further outlined its spill response plan for spills anywhere on-site, including the winter ice road, as well as employee training and procedures for cleanup and containment within the hazardous waste facility.[1117,1118]

A Community Representative from Cambridge Bay questioned Sabina as to whether they would be willing to assist with funding community search and rescue operations. In response, Sabina noted its requirement of maintaining site safety equipment and emergency personnel for the safety of on-site staff. Sabina further noted its willingness to support search and rescue operations within the Kitikmeot region; however, reiterated that helicopters and fixed-wing aircraft would not be located on-site year-round which could limit its capabilities.[1119]

Within their respective final written submissions on the FEIS Addendum and/or during the supplemental Final Hearing, Environment and Climate Change Canada (ECCC), Transport Canada (TC), the Government of Nunavut (GN), the Burnside Hunters and Trappers Association (BHTO), and Community Representatives commented on Sabina's spill modelling and emergency response plans relating to potential for ship-based fuel spills. Within its final written submission on the FEIS Addendum, ECCC recommended that Sabina provide additional information with regards to the: Oil Pollution Emergency Plan (OPEP); Bathurst Inlet Marine Diesel Fuel Spill Model; Tactical Fuel Spill Response Plan; third-party spill response contractor for potential fuel spill response at the Marine Laydown Area Oil Handling Facility; and response management structure and the Government of Canada's incident command system. Within its response to final written submissions on the FEIS Addendum, Sabina re-stated commitments made during the 2016 Final Hearing, provided additional clarification and information, and made a variety of commitments with regards to the provision of additional information, updated models, and plans, including:

[1114] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 542-543, lines 25-26 and 1.
[1115] K. Costello, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 582, lines 18-19.
[1116] K. Costello, Indigenous and Northern Affairs Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 583-584, lines 9-26 and 1-13.
[1117] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 921-922, lines 12-26 and 1-8.
[1118] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 936, lines 16-23.
[1119] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 815, lines 9-20.

- Emergency Response Contact Information
    - To update contact information within various plans;
- Oil Pollution Emergency Plan (OPEP)
    - Restated commitment to provide equipment for wildlife protection measures on site within the OPEP;
- Bathurst Inlet Marine Diesel Fuel Model
    - Clarification of model inputs, including terminal thickness, maximum water fraction, and emulsion rate value;
    - Commitment to rerun the Bathurst Inlet Marine Diesel Fuel Spill modelling with modified input variables to inform the tactical fuel response plan;
- Tactical Fuel Spill Response Plan
    - Commitment to develop a tactical fuel spill response plan for the Oil Handling Facility at the MLA prior to the commencement of any large-scale fuel transfer and storage activities;
- Third-Party Spill Response Contractor
    - Consideration of any potential contractual third party agreement during TC's review of the OPEP during the regulatory phase; and
- Response Management Structure
    - Commitment to further integrate its proposed response management structure with the Government of Canada's Incident Command System structure prior to the commencement of any large-scale fuel transfer activities.

During its presentation at the supplemental Final Hearing, ECCC noted that with regards to its recommendations related to the marine environment content in the FEIS, ECCC was satisfied with the updates Sabina provided in the FEIS Addendum and with the additional commitments made by Sabina, and ECCC confirmed that it had no further concerns.[1120]

Within its final written submission on the FEIS Addendum, TC recommended that Sabina clarify the maximum fuel transfer rate for the Oil Handling Facility, which would impact the level of the facility and the requirement for spill response, as inconsistent information was provided within the FEIS Addendum. Within its response to final written submissions on the FEIS Addendum, Sabina clarified the maximum fuel transfer rate and committed to updating all project documents during the regulatory phase. Sabina further clarified that the Oil Handling Facility would be a level two (2) facility. During its presentation at the supplemental Final Hearing, TC stated that it had no outstanding concerns related to the commitments within the FEIS Addendum or the information provided by Sabina.[1121]

During the supplemental Final Hearing, the GN asked Sabina what risk level it had categorized potential spills resulting from fuel resupply in its risk matrix. Sabina responded that the risk was rated as low, and

[1120] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing Transcript, June 1, 2017, pp. 483-486, lines 19-26, 1-26, 1-26 and 1-12.
[1121] A. Downing, Transport Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 581, lines 17-23 and pp. 582-583, lines 26 and 1-4.

that due to the potential consequences of a fuel spill during resupply, it was essential to prepare detailed response measures.[1122]

Within its final written submission on the FEIS Addendum, the BHTO discussed the potential for changes in the proposed shipping routes to impact the travel routes into and out of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo). The BHTO discussed the potential risks associated with the shipping route through Bathurst Inlet and requested that Sabina provide Bathurst Inlet and Bay Chimo with emergency spill response training and equipment. The BHTO further noted the potential for cumulative effects from shipping activities of multiple projects operating in the area and discussed concerns related to the potential for ice-breaking activities. During the supplemental Final Hearing, Sabina responded to these concerns and stated that "*there is a very low likelihood of ship-related accidents or spills occurring at Bathurst Inlet, but even with that extremely low likelihood, we will be ready if it happens*".[1123] Sabina noted that its shippers would be required to use modern charts and navigation equipment and that the 'safe shipping' routes charted by the federal government through Bathurst Inlet would be utilized, in addition to additional precautions such as not entering Bathurst Inlet if there is adverse weather or poor visibility. Sabina further clarified that it would only ship during the open-water season and that the number of ships per season would be less than five (5) and reiterated this following a question from a Community Representative from Kingoak (Bathurst Inlet). [1124] Sabina further stated that it would use ships with similar designs to those already used safely for community re-supply throughout Nunavut. Sabina discussed its related plans and committed "*to providing [spill kits and training to local community residents] to both Bathurst Inlet and Bay Chimo".*[1125]

The BHTO, as well as a Community Representative from Kingaok (Bathurst Inlet), further asked Sabina if it had any plans in place to ensure safe vessel navigation along the route to Bathurst Inlet, especially with regards to shallow areas and fluctuating water levels. Sabina stated within its response to the BHTO that it has access to navigation data provided by the Canadian Hydrographic Services that indicates that the corridor is sufficient in depth for vessel traffic. Acknowledging the vast knowledge of the residents of Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo), Sabina committed to "*engaging with those members before any ships enter so that we can go over our plans and talk about them and also talk about whether or not representatives want to be present when the first vessel comes in."*[1126] A Community Representative from Kingoak (Bathurst Inlet) asked Sabina if it had "*any plans in place to have the – the channel checked for obstructions like reefs that were not there – I mean, they were there but more underwater? Like, for instance, in the past, when – before – before we had fuel barges coming in, we had Canadian Coast Guard come check on the channel."*[1127] Sabina answered in response that in addition to the proper hydrographics being done, project-related ships would be equipped with sonar. Sabina further noted that the first vessel through the channel would not be large or a fuel vessel and

[1122] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 386-387, lines 23-26 and 1-11.
[1123] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 97, lines 7-10.
[1124] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 654-655, lines 24-26 and 1-10.
[1125] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 31, 2017, p. 98, lines 18-19.
[1126] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 394, lines 7-11.
[1127] S. Kapolak, Bathurst Inlet, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 653, lines 13-18.

would be brought in slowly to assess the route further.[1128] Sabina later reiterated this in response to a question from a Community Representative from Kugluktuk asking who Sabina's shipping company would be, and if a pilot would be used to help bring the ship into the harbour.[1129] Sabina also stated that a shipping company would be used that currently supplies communities or other mining companies in the north, with seasoned captains that are familiar with northern waters. Sabina also noted that ships have been down Bathurst Inlet in the last number of years.[1130] Later during the supplemental Final Hearing, a Community Representative from Kingaok (Bathurst Inlet) noted a preference for the use of Northern Transportation Company Limited (NTCL) for shipping services instead of NEAS as NTCL has been operating in the area for many years.[1131] In reply, Sabina noted its apprehension about hiring NTCL as they are currently in receivership and owned by the GNWT; Sabina confirmed it would carefully select an appropriately-sized ship for the first run down the Inlet.[1132]

Board staff asked the CCG whether it maintains accurate records of vessel transits through the Canadian Arctic for each open-water season and whether Sabina would be able to obtain forecasts of vessel traffic from the CCG or TC to assist in planning its annual marine resupply. The CCG responded that it tracks all vessels over 500 gross registered tonnes entering control zones.[1133] Fisheries and Oceans Canada (DFO) also added in a deferred response that the CCG uses a comprehensive tool called INNAV (Information System on Marine Navigation) to track details. Furthermore, DFO added that TC and the CCG can share, and have shared, shipping plans and forecasts with various operators as requested, and the CCG also holds daily ice calls in which discussions on current ice conditions, traffic patterns, and ice-breaker deployment occur.[1134] A Community Representative from Cambridge Bay later asked if the HTO would be able to be part of these meetings, and the CCG replied that it should not be a problem.[1135] This representative also indicated that the Cambridge Bay Hunters and Trappers Organization (HTO) has been working with Oceans North for the past seven (7) months to set up an automated system that would record all ships going through the Northwest Passage.[1136]

A Community Representative from Kugluktuk noted that he served with the CCG search and rescue auxiliary and that they would be holding an oil spill contingency workshop; he recommended that Sabina contact the CCG to coordinate. Sabina noted that it has had many conversations with the CCG

[1128] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 653-654.
[1129] J. Palongayak, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp.803-804, lines 18-26 and 1-2.
[1130] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 804-805, lines 9-26 and 1-2.
[1131] C. Kapolak, Bathurst Inlet, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p.1005, lines 8-18.
[1132] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 1007-1008, lines 26 and 1-8.
[1133] J. Brickett, Canadian Coast Guard, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 512, lines 9-22.
[1134] M. D'Aguiar, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 958-960, lines 14-26, 1-26, and 1-17.
[1135] J. Brickett, Canadian Coast Guard, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 982, lines 7-24.
[1136] B. Maksagak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 883-887, lines 18-26 and 1-2.

and that it would further reach out to identify any potential opportunities to participate or coordinate.[1137]

Board staff questioned Sabina on the potential to coordinate the delivery of annual resupply and/or public notice of scheduled shipping for the Back River and Doris North gold mines. In response, Sabina noted the potential for sharing loads as well as communication and coordination and indicated its willingness to enter into discussions with TMAC Resources Inc.[1138]

In follow-up questions to Board staff, Sabina asked TC to provide clarification on the Government of Canada's Oceans Protection Plan, and specifically on proactive vessel management and TC's role. TC noted in response that there are four (4) main priority areas for the Oil Pollution Protection Plan: become a world leader in marine safety; restore and protect marine ecosystems and habitats; strengthen partnerships with Indigenous communities, including building local emergency response capacity; and invest in oil spill cleanup research.[1139]

During the supplemental Final Hearing, ECCC and Board staff raised questions with regards to the Mackenzie Delta Spill Response Corporation (MDSRC). Sabina noted in response to questions raised by ECCC that it would be updating its plans to incorporate additional information obtained as a result of its recent commitments, including the provision of spill response equipment in Kingaok (Bathurst Bay) and Omingmaktok (Bay Chimo) and joining the Mackenzie Delta Spill Response Corporation.[1140] Board staff asked Sabina if it could clarify how MDSRC equipment depots and response locations would be staffed and how quickly they could respond to a marine emergency. Sabina noted in response that as its membership into the MDSRC is new, it was currently investigating how the partnership would unfold. However, Sabina clarified that spill response was still its responsibility and that it would have the capability to respond any point along the proposed route and that membership into the MDSRC is an additional contingency plan.[1141]

Additional comments and questions regarding shipping safety and the potential for spills in the marine environment came from several Community Representatives during the supplemental Final Hearing. A representative from Gjoa Haven mentioned an incident in that community last year when individuals accidently bumped into the fuel shipping pipeline in the dark, and he wondered whether "*glow sticks or neon colour reflectors*" could be added to the pipeline to increase visibility and prevent people from bumping into them.[1142] In response, Sabina thanked the representative for the idea and promised to look into it, suggesting even buoys might work to mark the pipeline (given the fuel transfer would be conducted only during 24-hour daylight). Sabina noted that it would also ensure people in Kingaok

[1137] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 668-670, lines 18-24, 22-26, and 1.
[1138] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 317-318, lines 12-18 and 1-7.
[1139] A. Downing, Transport Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 585-587, lines 13-26, 1-26, and 1-6.
[1140] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 387-388, lines 20-26 and 1-9.
[1141] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 396-397, lines 1-26, and 1-6.
[1142] G. K. Porter, Gjoa Haven. NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 687-688, lines 15-26 and 1-2.

(Bathurst Inlet) and Omingmaktok (Bay Chimo) were aware of when fuel was being offloaded, and added that the fuel line would be inspected at least hourly during the offloading of fuel. [1143]

A Community Representative from Cambridge Bay noted there has always been a lot of timber and other debris along the coast of Bathurst Inlet. The representative noted he had not seen the MLA but asked Sabina whether it would be cleared of debris.[1144] Sabina noted in response that little debris had been seen in the area during any of Sabina's visits to the site, but that Sabina would certainly clear any debris in the area to ensure safe vessel travel.[1145]

In response to an enquiry from a Community Representative on the potential for shipping in the winter,[1146] Sabina emphasized that shipping would only occur in summer, in ice free conditions.[1147] Multiple parties also questioned Sabina as well as TC on whether the Project would include the overwintering of barges or other infrastructure (e.g., a deep-sea port) at the MLA.[1148,1149] Sabina responded that there would be no deep-sea port and no significant in-water works would be built, and that the current mine design does not include the overwintering of fuel barges.[1150,1151] TC noted in response that if project activities were to change in the future and there would be overwintering of barges or vessels, Sabina would be required to follow guidelines as required by TC.[1152]

A Community Representative from Omingmaktok (Bay Chimo) asked Sabina to clarify the role of trained community members from Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) in the event of a spill at the MLA, as the majority of individuals would not be in the area in the summer. Sabina replied that if community members happen to be present, then they would be trained and able to respond, but emphasized that the spill response materials would be on shore ready to be used immediately, without having to rely on the local community members.[1153]

[1143] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 688-689, lines 6-26 and 1-3.

[1144] J. Haniliak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 819-820, lines 21-26 and 1-7.

[1145] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 822, lines 3-13.

[1146] P. Akkikungnaw, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 678-679, lines 25-26 and 1.

[1147] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 679, lines 19-26.

[1148] See R. Barry, NIRB staff, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 319, lines 12-14; C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 584, lines 11-15.

[1149] J. Haniliak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 665-666, lines 22-26 and 1-7.

[1150] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 666, lines 11-23.

[1151] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 318-319, lines 18-26 and 1-5.

[1152] A. Downing, Transport Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 584, lines 17-22.

[1153] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 808-810, lines 17-26, 1-26, and 1-5.

A Community Representative from Kugluktuk noted that ships had run aground near Kugluktuk, but understood that mapping has been updated to increase safety. Transport Canada confirmed this in its response.[1154]

A Community Representative from Kugluktuk asked if, in the event of an accident in or at the harbour, TC would close the harbour down until the accident was completely investigated. In response, the CCG noted that the marine inspectors could halt operations for evidentiary or safety reasons, and that it could also halt operations if pollution resulted from an accident and if normal activities would interfere with the response to that pollution. [1155]

A Community Representative from Kingaok (Bathurst Inlet) asked TC if there would be a CCG vessel nearby if a barge or ship got into trouble. In reply, the CCG noted that the captain of the vessel ultimately determines what action would be most appropriate, but indicated that the CCG keeps a number of ice-breakers dispersed across the Arctic during the shipping season and could provide assistance if needed.[1156]

In response to a Community Representative from Taloyoak's question about shipping routes, Sabina noted that it had not yet confirmed which route it would take – whether from Vancouver, Montreal, or Hay River – and said likely a combination of all three (3) routes would be used.[1157]

Aside from potential marine incidents, the potential for fuel spills on land along the proposed winter ice road and at the mine site was another topic raised during the supplemental Final Hearing by several parties. A Community Representative from Omingmaktok (Bay Chimo) asked about the potential hazards related to having fuel tanks located near camp facilities. Sabina replied that secondary containment would be used to contain fuel and hazardous materials. [1158] The BHTO noted the potential for spills at drill sites and the need for adequately sized tarps.[1159] Sabina noted that equipment such as generators would be placed on top of tarps to protect the tundra. Sabina added that the KIA and INAC inspect the site on an annual basis and noted that it would follow-up with the site to ensure this is occurring.[1160]

The BHTO also asked Sabina whether it had any plans for responding to and monitoring potential fuel spills along the proposed winter ice road.[1161] Sabina noted that it has a policy that all spills, no matter

[1154] A. Downing, Transport Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 977, lines 17-26 and 1-11.
[1155] J. Brickett, Canadian Coast Guard, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 988-989, lines 11-26 and 1-6.
[1156] J. Brickett, , Canadian Coast Guard, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 989-990, lines 12-26 and 1-16.
[1157] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 983-984, lines 3-26 and 1-13.
[1158] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 664-665, lines 3-26 and 1-13.
[1159] C. Kapolak, Bathurst Inlet, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 389, lines 25-26 and 1-22
[1160] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 391-392, lines 25-26 and 1-13.
[1161] C. Kapolak, Bathurst Inlet, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 389-390, lines 14-24.

the size, would be reported to the company's environment department and that in addition to each truck carrying spill equipment, larger spill kits would be placed along the winter road and at the Goose Property and the MLA. Sabina further described its internal and external spill reporting protocols, including those required as part of the NIRB's and authorizing agencies' reporting mechanisms.[1162] Sabina added that its updated Oil Pollution Emergency Plan in the FEIS Addendum incorporates potential fuel spills on land. Sabina concluded that fuel spills on land have:

> *…similar regulations around it, and – and we take it just as seriously, a spill on land as we do a spill in the ocean, and there is all of the spill response capabilities. All of the training and all of the things around that are – are at the same level, so whether a spill happens on land or – or in the water.*[1163]

An Elder from Kugaaruk later commented that he had previously worked as a heavy equipment operator and noted that oil can leak from machinery onto the land and into the rivers. In response, Sabina acknowledged that spills do occur, but reiterated that a spill response and reporting mechanism is in place and spill kits are placed in each vehicle and all over the site. [1164]

The BHTO, on behalf of the Omingmaktok HTO, expressed concern during the supplemental Final Hearing about the safety of the proposed winter ice road to run between the MLA and the Goose mine site due to the large ravine that would have to be crossed[1165]. This representative of Omingmaktok later specified that

> *My concern is – is regarding the winter road around the big ravine when you hit the land from MLA. As you might know, Bathurst Inlet melts or gets warmer faster than other northern communities, about a month or earlier, especially in late April. How are you going to keep the road safe to prevent accidents for your trucks hauling fuel and supplies from marine laydown are to Goose Lake?*[1166]

In response, Sabina noted that it had conducted multiple surveys of the route, found a route that would bypass the ravine, and that it was confident that the proposed route would be safe. Sabina further noted the proposed timing of the establishment and operation of the winter ice road and stated that it would be monitoring environmental conditions closely and would revise the planned dates accordingly.[1167,1168]

[1162] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 392-393, lines 14-26 and 1-19.
[1163] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 395, lines 6-12.
[1164] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 710-712, lines 22-26, 1-26 and 1-20.
[1165] C. Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 316, lines 5-9.
[1166] P. Kapolak, Omingmaktok (Bay Chimo), NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 656, lines 9-16.
[1167] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2016, p. 316, lines 2-23.
[1168] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2016, pp. 656-657, lines 26, 1-26.

A Community Representative from Cambridge Bay commented on the need to build the winter road using good engineers, and suggested that people from Omingmaktok (Bay Chimo) or Kingaok (Bathurst Inlet) could perhaps provide guidance.[1169] Sabina also agreed that the road would need to be built carefully and expertly to ensure it would operate safely, and noted that Sabina would review any Traditional Knowledge available and would speak with the Cambridge Bay HTO prior to construction.

6.2.3 Views of the Board

During the 2016 Final Hearing, the Board noted multiple questions by parties and Community Representatives regarding Sabina's management plans and emergency preparedness for both shipping fuel and supplies through Arctic waters as well as responding to potential emergencies such as fuel spills. Sabina responded to a question raised by the Board and clarified that each project-related ship would be responsible for notifying the federal government upon entering and exiting Arctic waters and that it has proposed a notification system for the Kitikmeot communities to ensure that they are advised when vessels are moving in proximity of the communities.[1170]

The Board also questioned Transport Canada (TC) on its emergency response management role and whether it would be directing the Canadian Coast Guard ships to be located closer to the shipping route associated with the Project in the event of a spill in the Bathurst Inlet area. TC responded that it would not be directing the Canadian Coast Guard on its vessel locations and clarified that its applicable role would be to review and approve the Oil Pollution Emergency Plan for vessels and the oil handling facility.[1171] Sabina further committed to making appropriate updates to the Risk Management and Emergency Response Plan to reflect the latest version of TC's *Emergency Response Guidebook*. TC noted that it had no outstanding related concerns.

The Board also asked Sabina during the 2016 Final Hearing whether a fuel spill along the shipping route or during fuel transfer would disrupt operations due to the loss of fuel and what the associated proposed mitigation measures would be. Sabina noted in response that operations would need sufficient amounts of fuel and that each summer a year's supply of fuel would be moved to the Goose Property and that if a vessel was unable to reach the Marine Laydown Area (MLA), there would be time to adjust operating criteria. Sabina noted that mitigation measures could include arranging for additional vessels to transport fuel or flying fuel in during a state of emergency.[1172]

The Board further requested clarification on why the ocean floor for the shipping routes did not require further mapping, noting concern with respect to previous vessel grounding incidents that occurred in the Queen Maud Gulf and Coronation Gulf.[1173,1174] Sabina indicated the Canadian Hydrographic Service

[1169] J. Haniliak, Cambridge Bay, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 665-666, lines 2-7.
[1170] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 184-185, lines 23-26 and 1.
[1171] D. Kirkland, Transport Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 546-547, lines 22-26 and 1-5.
[1172] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 188-189, lines 18-26 and 1-14.
[1173] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 182, lines 13-16.
[1174] P. (Omingmakyok) Kadlun, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 548-549, lines 26 and 1-8.

(CHS) had already assessed the majority or portion of the known shipping channel for the Northwest Passage and it was determined that the area would have sufficient depth for the vessels used to ship supplies for the project. DFO deferred responding to the Board's question to consult with the CHS, and later responded that the CHS reviewed Sabina's planned shipping route and found adequate data and charts are available for safe navigation. DFO also provided a recommendation from the CHS for Sabina to submit a post-construction scaled depiction of the MLA, including any new bathymetry aspects, for it to update navigational charts.[1175]

During the supplemental Final Hearing, the Board further asked TC whether the waters of Bathurst Inlet had been mapped adequately. TC noted in response that the CHS Survey Group would be responsible for mapping waters and that there are current maps available of Bathurst Inlet.[1176] Sabina noted that the CHS provided the company with copies of the bathymetric and LIDAR surveys completed from the top of Bathurst Inlet to the proposed MLA and that there is an established shipping corridor.[1177] In a deferred response, DFO, on behalf of the CHS, confirmed that the CHS has reviewed Sabina's planned shipping route as well as the available bathymetric charts, and commented that there is adequate data along a particular corridor that was surveyed in the late 1980s. DFO also reiterated during supplemental Final Hearing that the CHS had recommended at the 2016 Final Hearing that new bathymetric surveys be conducted of the MLA following construction.[1178]

During the 2016 Final Hearing, Sabina was also questioned by the Board on its capability for rapid response should a vessel be stranded in the Bathurst Inlet during periods of high winds. Sabina responded that through extensive discussion with TC, the Canadian Coast Guard, and the CHS, the control of the vessel during such events would be the responsibility of the captain. Sabina added that within these circumstances, measures in response to a fuel spill would include: containment undertaken by the vessel, response assistance by Sabina, and then external assistance. Sabina specified that contracted vessels would only be carrying diesel fuel, which would have less environmental impacts in the event of a spill than other types of fuel.[1179]

During the supplemental Final Hearing, the Board requested that Environment and Climate Change Canada (ECCC) clarify what an incident command system is. In response, ECCC explained that it is a formal response management structure to be used when multiple parties need to respond to a larger spill. ECCC further clarified It would identify the appropriate contact and means of contact for Sabina in the event a large spill were to occur.[1180]

During the supplemental Final Hearing, the Board asked Sabina to confirm how it had factored in high winds, waves, and the ruggedness of Bathurst Inlet into its spill scenarios. Sabina responded that its

[1175] G. Williston, Fisheries and Oceans Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2017, p. 1165, lines 5-24.
[1176] A. Downing, Transport Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 589-590, lines 8-26 and 1-6.
[1177] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 591, lines 1-17.
[1178] V. D'Amours-Gauthier, Fisheries and Oceans Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, pp. 960-961, lines 20-26 and 1-22.
[1179] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 401-402, lines 12-26 and 1-19.
[1180] L. Ransom, Environment and Climate Change Canada, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 492-493, lines 9-11, 16-26 and 1.

spills modeling incorporates multiple factors, including dispersal of any spilled fuel, and is focused on the MLA as that location would have the highest likelihood of a spill as a result of transporting fuel from ship to land. Sabina added that ships would have the ability to respond to fuel spills at any point along the shipping route and re-iterated that it had committed to re-running its Bathurst Inlet Marine Diesel Fuel Model and revising its input variables in response to similar concerns raised by ECCC.[1181]

The Board also noted the concerns raised by Community Representatives regarding standing tanks and the potential effects of spills. During the 2016 Final Hearing, the Board questioned Sabina on spill response measures associated with standing tanks as well as what measures would be taken in the event that a containment berm was breached. In response, Sabina noted that the majority of fuel on-site would be Arctic grade diesel and stored in large steel tanks with secondary containment. Sabina clarified that the containment facility was designed to hold the entire contents of the tank plus 10% and that the tanks would only be filled to 85-90% capacity to ensure sufficient storage in the event of a spill. Sabina added that all dams and berms would be systematically inspected through a two (2) part process: periodic general inspection by site staff and inspections by dam specialists or staff trained to fully evaluate the stability of the dams. A breach of a dam or berm, Sabina noted, would result in an emergency type situation and response steps would be: personnel safety, cessation and containment of spill, reporting, and clean-up. Sabina concluded that response measures would be undertaken specific to whether a spill occurred on land or water. If an incident occurs, Sabina committed to reporting to and engaging in discussions with the Kitikmeot Inuit Association as the landowner, the GN, and federal departments (including ECCC, DFO, and INAC) and Sabina also committed to notifying local hamlets and HTOs.[1182]

During the 2016 Final Hearing, the Board also requested clarification on whether its staff would be located year-round at the MLA, especially with respect to the proposed fuel storage area.[1183] Sabina noted that it was continuing to consider its options but in its most recent plans staff would be at the MLA only seasonally during the winter and summer to receive and move supplies.[1184]

The Board recognized the significance of potential concerns with regards to the winter ice road, expressed throughout the 2016 Final Hearing. The Board further commented on the proposed winter ice road operations and asked Sabina to clarify the volume of truck traffic it would expect per day. Sabina noted in response that approximately 27 truckloads per day, or approximately two (2) trucks per hour, would transit the proposed winter ice road, which would operate January through April. Sabina added that the maximum speed limit would be set at 60 kilometres an hour and one (1) trip from the MLA to the Goose Property would be expected to take approximately five (5) to six (6) hours.[1185]

The Board further asked Sabina during the 2016 Final hearing what process would be implemented immediately following a fuel truck spill on the proposed winter ice road or if a vehicle went through the

[1181] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 400-402, lines 26, 1-26 and 1-15.
[1182] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 395-398.
[1183] H. Ohokannoak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 82, lines 13-18.
[1184] W. Carson, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 82, lines 22-25.
[1185] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 84-86.

ice. Sabina responded that while specific measures would vary by scenario, the general process would be to: ensure driver safety, report the spill, control/contain the spill, clean up the spill, and secure the vehicle from falling further into the ice. Sabina added that all vehicles, as well as emergency shelters along the road, would be equipped with spill response equipment and that if a spill should occur on the ice, available surface hydrocarbons would be burned and contaminated snow would be collected and transported to the proposed tank farm.[1186] The Board anticipates that when the winter ice road is constructed, all potential operational risks would be reviewed and mitigation measures incorporated into management plans.

During the supplemental Final Hearing, the Board asked Sabina if it had "*considered the potential of hunters travelling through within the project area, and if so, can Sabina explain how it would work with communities to ensure that community members know what to do when they're travelling within the project area in the event of an accident of malfunction?*" [1187] In response, Sabina noted that with regards to the marine environment it would notify communities of the approximate time and date that vessels would be passing by their communities and would work 'diligently' with Kingaok (Bathurst Inlet) and Omingmaktok (Bay Chimo) residents as they would have a higher chance of potentially interacting with vessels in closer proximity to Bathurst Inlet. Sabina explained that with regards to the terrestrial environment, it would focus on identifying and informing members of the public who were on or near the project sites. While Sabina noted that additional details of communication would be developed, and that preliminary plans include providing hunters and trappers in the area with radios to enable them to communicate directly with project vehicles.[1188]

In response to the Board's request during the supplemental Final Hearing for clarification on where oil spill kits would be provided, Sabina stated that significant spill response equipment would be located at the MLA and the Goose site, in trucks, on each vessel, and at every location where ship to shore fuel transfer would occur.[1189]

In the 2016 Final Hearing Report, the Board concluded that it had considerable uncertainty in relation to Sabina's capabilities to respond to spills within Bathurst Inlet, should neither the shipper nor the Canadian Coast Guard be in a position to respond. The Board noted Bathurst Inlet remains relatively pristine and untouched by large scale and potentially permanent impacts. The Board acknowledges the additional information provided by Sabina in the FEIS Addendum and at the supplemental Final Hearing, as well as Parties including Transport Canada, and the Canadian Coast Guard through the supplemental Final Hearing regarding marine shipping and marine fuel spill response. The Board has greater confidence in the matter with the clarification of support available to Sabina from these federal agencies as regards mapping, vessel tracking, and accident response. The Board appreciates Sabina's commitments to ensuring both safe Arctic shipping and transport of fuel overland, and acknowledges the updated Spill Contingency Plan and Fuel Management Plan provided by Sabina in the FEIS Addendum. The Board understands that local communities have reservations about shipping of fuel

[1186] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 392-394.
[1187] K. Kaluraq, Nunavut Impact Review Board, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 398, lines 13-19.
[1188] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 399-400, lines 1-26 and 1-24.
[1189] W. Carson, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 397-398, lines 15-26 and 1-8.

into Bathurst Inlet and overland via winter road, and expects Sabina to maintain a precautionary approach by continuously reviewing and improving management plans and procedures to ensure potential risks are identified and mitigated. The Board also notes concerns regarding explosives transportation and management would be addressed through existing guidelines and regulations under the jurisdiction of NRCan and TC.

6.2.4 Conclusions and Recommendations of the Board

In the 2016 Final Hearing Report, the Board concluded that it was not confident that the proposed management and mitigation plans related to shipping and fuel spill response would be adequate. Following a review of the new material presented by Sabina in the FEIS Addendum and at the supplemental Final Hearing, as well as the updated views of Parties based on Sabina's commitments, the Board believes that the Project's potential effects related to Accidents and Malfunctions could be appropriately managed through the commitments provided by the Proponent and application of mitigation measures. Specifically, the Board recommends terms and conditions requiring the following (a brief summary of the Board's recommended terms and conditions is provided below for ease of reference only; see Section 8: Recommended Project-Specific Terms and Conditions for the complete wording of the recommended terms and conditions for this section):

- Implementing a Wildlife Mitigation and Monitoring Plan that includes operational requirements to reduce the likelihood and severity of impacts from fuel spills into the marine environment, specifically in consideration of polar bears, seals, other marine wildlife, and migratory birds;
- Ensure that the Oil Pollution Emergency Plan includes a list of authorized personnel for spill reporting, details on staff training requirements;
- Using only Transport Canada certified shippers for project-related shipping, and ensuring shippers are informed of the applicable operational plans and commitments;
- Ensure that necessary spill response equipment is on site prior to commencement of project shipping, and employees, contractors, and local community members have completed training;
- Updated shore line features and bathymetry are reported to the appropriate regulatory authorities following construction of the MLA shoreline infrastructure; and
- Fuel trucks meet industry design standards and undergo regular maintenance.

6.3 ALTERNATIVE ANALYSIS

6.3.1 Views of the Proponent

With respect to the analysis of alternatives within the FEIS, the Proponent considered both alternatives to the development of the Project, as well as alternative methods of carrying out the Project. The Proponent's analysis of alternatives and conclusions were provided in Volume 2, Section 4 of the FEIS. With respect to the alternatives to the development of the Project, the Proponent concluded that there were three possible alternatives:

- proceed with mine development in the near term, as proposed in the FEIS, or on a decelerated timeline;
- delay the Project until circumstances are more favourable; or

- abandon the Project.[1190]

In this analysis of the "Go/No-Go" alternatives, the Proponent concluded that although the long-term economic viability of the Project is "highly sensitive" to variations in gold and fuel prices, on the basis of continued feasibility studies commencing in October 2013 and continuing through to June and September 2015: "…the Project remains technically and economically feasible".[1191] Having concluded that the Project remains technically and economically feasible and with the recognition of the socio-economic benefits that will be delivered to the Kitikmeot region as a result of the Project, the Proponent concluded that proceeding with the mine development in the near term as proposed in the FEIS remained the preferred alternative.

In the FEIS Addendum, the Proponent did not update the alternatives assessment, and as such, the Board is assuming that the mine development as proposed in the FEIS remained the preferred alternative.[1192]

Alternatives means of carrying out the Project were also evaluated by the Proponent on the basis of the following criteria:

- Technical feasibility;
- Economic validity;
- Potential impacts to the environment; and
- Amenability to reclamation.

Community acceptability or preference and enhancement of socio-economic effects were also considered during the analysis of alternatives. Community acceptability was primarily gauged by the Proponent by presenting the alternatives assessment analyses and conclusions for all major alternatives during community consultations conducted in each Kitikmeot community and Yellowknife in June 2015, discussion during public and stakeholder meetings, and presentation of these analyses on descriptive posters that were placed in public meeting halls.[1193]

Under the alternative means of carrying out the Project, the Proponent considered two categories of alternatives. "Tier one" alternatives provided options for different methods of executing the Project in key areas, such open pit versus underground mining. Once the preferred alternative had been chosen in respect of these key aspects of carrying out the Project, the Proponent's alternatives analysis then shifted to "Tier Two" alternatives that consisted of alternative means of optimizing Project performance. These alternatives considered various ways that each of the chosen key components could be carried out. The Proponent noted that this analysis included consideration of trade-offs necessary to choose the best approach and also noted that as the Project advances, these types of alternatives may be further refined and evaluated. This refinement may result in changes to the final Project plan.

In respect of Tier One alternatives within the Project, the following key Project alternatives were analyzed in the FEIS, Volume 2, Section 4.2:

[1190] FEIS, Volume 2, Section 4.2.1, p. 4-4.
[1191] FEIS, Volume 2, Section 4.2.1, p. 4-4.
[1192] FEIS Addendum, Volume 2, Section 2, p. 2-2.
[1193] FEIS, Volume 2, Section 4.1.5, pp. 4-2-4-3.

- Project Go/No-Go decision;
- Access and transportation alternatives for the movement of freight and personnel (including access and transportation to the Project site, air transportation, marine transportation, overland transportation and access, access and transportation within the Project locations);
- Mineral reserves and mining operations (including open pit and underground mine operations and options for ore management);
- Ore processing and gold recovery (including options for production rate changes, options for processing the ore and gold recovery and tailings disposal alternatives);
- Alternatives for tailings storage location (including in-pit disposal of tailings and waste rock);
- Alternatives for waste rock management;
- Location of the main Goose Plant Site infrastructure;
- Location of the Marine Laydown Area (MLA);
- Water management (including groundwater, surface water, lake dewatering, contact water and cyanide detoxification in process water);
- Power generation; and
- Site reclamation (including abandonment and reclamation of the Project and care and maintenance of the Project).

With respect to Tier Two alternatives within the Project the following alternatives were discussed in Volume 2, Section 4.3 of the FEIS:

- Detailed Site Layouts;
- Options for Quarry Sites;
- Emergency Shelters, Seasonal/Temporary Exploration Camps;
- Goose Property Infrastructure (including freshwater sources and other infrastructure);
- MLA Infrastructure;
- Domestic Waste Management (including greywater and blackwater treatment);
- Options for Equipment;
- Options for Future Development of Other Mineral Deposits
- Bulk Fuel Storage Alternatives; and
- On-site Accommodations and Worker-related Alternatives (including work scheduling, worker sourcing and worker accommodations).

Although for the most part, the alternatives analyses considered the alternatives originally proposed in the *Draft* Environmental Impact Statement (DEIS), there were two (2) alternatives (connection to Tibbit to Contwoyto Winter Road and Hydroelectric power as an alternative means of power generation) that had been proposed in the DEIS that were subsequently considered to be non-viable by the Proponent and were not included in the FEIS as a result. Accordingly, these alternatives were not considered further by any of the parties to the Review or the Board.

Table 6 below provides the results of the Proponent's detailed alternatives analysis that yielded the following preferred alternatives for the Project.

Table 6: Summary of Tier 1 Preferred Alternatives[1194]

Category of Alternative	Preferred Alternative	FEIS Reference
Project "Go/No Go" alternative	Proceed as proposed	4.2.1
Access and Transportation to the Project Site	Overland access via all weather and/or winter ice roads from Yellowknife	4.2.2
	Establishing a marine receiving and staging area on Bathurst Inlet with a link to the Goose Property supplemented by air transportation at Goose and MLA	4.2.2
Air Transportation	Ice airstrips and open water float access using nearby lakes	4.2.2.2
	All weather airstrips to 1,524 metres to support year round access with up to Hercules, or equivalent sized aircraft	4.2.2.2
Marshalling Port and Route	East coast through Northwest Passage, past Cambridge Bay and south towards Kingaok (Bathurst Inlet)	4.2.2.3
	From West Coast around Alaska, via Northwest Passage and south towards Kingaok (Bathurst Inlet)	4.2.2.3
Marine Shipping Season	Open-water shipping only (up to 3 months)	4.2.2.3
Site Selection for MLA	MLA Potential Site 2 (Feasibility Study Design)	4.2.8
Marine Access Infrastructure	Project Specific MLA	4.2.8.1
Overland Transportation between MLA, Goose and George Exploration Camps	Winter Ice Road	4.2.2.4
Access and Transportation within Project Locations	All-weather road	4.2.2.5
Mining Areas	Goose Deposits only	4.2.3
Ore Management	Multiple Ore Stockpiles - one pad	4.2.3.2
Mineral Benefaction Options	Whole ore leaching & gravity methods	4.2.4
Production Rate	6000 tonnes per day	4.2.4.1
Chemicals for extracting gold	Use sodium cyanide in leach process (NaCN)	4.2.4.2
Tailings Disposal Alternatives	Traditional tailings slurry (~50% solids)	4.2.4.3
Alternatives for Tailings Storage Locations	Subaerial deposition at Tailings Storage Facility (TSF) Site C (#40)	4.2.5
	Subaqueous deposition in open pits	4.2.5
Waste Rock Management	Freeze back with a thermal non-potentially acid generating (NPAG) cover	4.2.6

[1194] As adapted from the summary analysis provided by the Proponent in Vol. 2, Appendix V2-4C: Summary Results from Select Alternative Assessments.

Category of Alternative	Preferred Alternative	FEIS Reference
	Subaqueous disposal in open pits	4.2.6
Waste Rock Storage area (WRSA) Alternatives	Local WRSAs near each mining area	4.2.6
All site infrastructure	Proposed locations	4.2.7
Alternatives for Water Management	Segregation of non-contact water, treatment of contact water, and temporary storage of saline groundwater	4.2.9
Saline Groundwater Management	Temporarily store, then pump into mined out underground voids	4.2.9.1
	Meromictic lake in mined out open pit	4.2.9.1
Power Generation	Diesel generators	4.2.10
Closure concept	Progressive reclamation	4.2.11
Source of quarried materials	Local bedrock locations – within current mine operations footprint (i.e. waste rock)	4.3.2
	Cut material	4.3.2
Source of fresh make up water	Goose Lake	4.3.4.1
	Big Lake	4.3.4.1
Options for diesel fuel transfer to MLA	By tankers that will anchor offshore and fuel will be offloaded through a floating host to a shore manifold to a pipeline to the on-land fuel storage tanks	4.3.5
Bulk Fuel Storage Alternatives	On-land storage of fuel in tanks	4.3.9
Standard Work Rotation during operations	Two (2) weeks on-site and three (3) weeks off-site	4.3.10.1
Work Sourcing (Direct Points of Hire)	Combination of access hubs in Yellowknife and Cambridge Bay	4.3.10.2
Worker Accommodation at MLA	Prefabricated accommodations building	4.3.10.3
Waste Management - Greywater and Blackwater Treatment Goose	Treat using a membrane bioreactor or similar biological process	4.3.6.1
Waste Management – Greywater - MLA	Direct discharge of untreated greywater to an approved sump location	4.3.6.1
Waste Management – Blackwater Treatment - MLA	Use of Pacto units with incineration of the waste and appropriate disposal of the resultant ash	4.3.6.1

6.3.2 Views and Concerns of Interested Parties

In general, parties noted support for the Project proceeding as proposed by Sabina.[1195] However, it was apparent at the 2016 Final Hearing that based on concerns about potential for any impacts to caribou in

[1195] See for example, S. Anablak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p.630, lines 7-9; L. Taipana, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1326, lines 4-12; E. Kakolak, Omingmaktok (Bay Chimo), NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1326, line 22; B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1331, lines 14-25; and L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, pp. 420-421, lines 23-26 and 1-4 .

the Bathurst herd, support for the Project proceeding at that time was not unanimous:

> *The Yellowknives contend that the Bathurst herd is no condition to sustain any more insults. Energetic modelling, which is computational modelling performed for other projects by the Government of the Northwest Territories, shows very little room for any additional stress. Likewise, traditional harvesters' reports of lean caribou with little-to-no-fat reserves support the model's predictions…*[1196]

> *The Yellowknives oppose this project. The threat it poses to their culture, heritage, and way of life are just too great. If the Yellowknives and other Dene are the caribou people, who will they be when the caribou is gone? The Yellowknives cannot support any project that risks driving the final nail into the caribou's coffin even if it's a golden one.* [1197]

In response to these concerns and the position that the No-Go Alternative should be preferred until the Bathurst caribou populations rebound, the Kitikmeot Inuit Association (KIA) summarized their views and the views of many local residents as follows:

> *KIA notes the comments made by the Yellowknives Dene First Nation. Inuit and First Nations from the NWT all face the challenges that come with providing for our people, ensuring that our youth have opportunities in improving the lives of our beneficiaries. We have to balance these challenges with our need to protect all cultural lands and wildlife, and we all know this is not easy. But in KIA's experience, the best way to achieve those goals is to work together, and mining offers important opportunities that we cannot ignore. That means encouraging responsible mining while ensuring environmental protection. And as our president indicated earlier this week, KIA is ready to work with Sabina. We are confident this company will keep its promises. KIA has all the tools necessary to deal with any situation where Sabina's performance falls short of our expectations.*[1198]

With respect to specific alternative means of carrying out the Project, the Board heard that if the Project was approved to proceed, the preferred alternative means of developing the Back River Gold Mine Project were generally acceptable to the communities and Intervenors.[1199]

During the technical review of the *Draft* Environmental Impact Statement (DEIS), the Kitikmeot Inuit Association and Community Representatives familiar with the area expressed concerns regarding the location of the Tailings Storage Facility (TSF) as it was originally proposed in the DEIS. On this basis, the Proponent moved the TSF to a more acceptable location and also revised the Tailings Management Plan to reduce the footprint of the TSF.

In addition, following the submission of the *Draft* Environmental Impact Statement, the Proponent

[1196] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 758-759, lines 21-26 and lines 1-2.
[1197] A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 759-760, lines 26 and lines 1-6.
[1198] P. Emingak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1343, lines 3-20.
[1199] See for example the exchange between J. Adamczewski. Government of the Northwest Territories and A. Power, Yellowknives Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 770, lines 1-18.

responded to significant concerns and regulatory issues raised by several parties about the inclusion of mining at the George Property by removing mine development at the George Property from the Project under Review. During the 2016 Final Hearing, the Government of the Northwest Territories (GNWT) noted the importance of this change:

> *The Government of the Northwest Territories acknowledges that Sabina's removal of the George Property from the Back River Project means that the annual reange of the Bathurst herd based on analysis of collaring locations does not overlap either geographically with the project development area of the Goose Property and marine Laydown area, nor seasonally with the winter road between the two sites.*
>
> *The Government of the Northwest Territories agrees that the project as it is now proposed represents a reduced risk to Bathurst caribou of experiencing negative impacts from the Back River Project. However, the Government of the Northwest Territories maintains that appropriate planning in the event that range shifts occur along with robust caribou mitigation measures for all caribou are key to ensuring that impacts to both Bathurst and Beverly caribou remain not significant.*[1200]

During the supplemental Final Hearing, the Board heard that considering the significant revisions to Sabina's plans with respect to mitigation, management and monitoring associated with potential effects to caribou, there was widespread support for the Project as proposed in the FEIS.[1201]

6.3.3 Views of the Board

The Board notes that the changes to the Project in between the DEIS and FEIS stages that resulted in the Proponent removing the George Property from the scope of the Project and changing the location of the Tailings Storage Facility demonstrate the Proponent's willingness to choose alternative options that are preferable from a community or regulatory perspective, and also from the perspective of reducing the potential for project-induced impacts. In addition, the Board notes that during the Board's further assessment of the Project following the release of the 2016 Final Hearing Report, Sabina has worked with the potentially affected communities, the Kitikmeot Inuit Association, and other Intervenors to significantly improve the Project and associated mitigation, management and monitoring measures. The Board commends Sabina's commitment to improving the Project to adopt highly protective and precautionary effects mitigation plans with respect to terrestrial wildlife and caribou in particular. The Board appreciates that the NIRB's review process provided a forum for these efforts and that the Proponent was responsive and willing to adopt better alternatives to reflect the concerns and issues raised by the Board, the Intervenors, and Community Representatives.

[1200] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1236, lines 7-24.

[1201] See for example, C. (Connie) Kapolak, Burnside Hunters and Trappers Organization, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1021; B. Maksagak, Iqaluktutiak Hunters and Trappers Association, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1021; J. Palongayak, Kugluktuk, Kugluktuk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1023; P. Akkikungnaq, Gjoa Haven, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1026; J. Ugyuk, Taloyoak, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1027; and O. Alakannuark, Kugaaruk, NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 1028.

With respect to alternative means of carrying out the Project, at the 2016 Final Hearing the Board questioned the Proponent with respect to the considerations that made the seasonal winter ice road the preferred option for transportation from Goose Lake to the Marine Laydown Area (MLA) versus the construction of a permanent all-weather road. In reply, Sabina noted that that the seasonal winter ice road was chosen primarily to reduce the costs of project development, and also because Sabina recognized that an all-weather road may have more impact on caribou or other wildlife.[1202]

At the 2016 Final Hearing, the Board also questioned Sabina regarding the considerations that led Sabina to choose the site for the MLA. The Proponent replied that the key criterion was technical, as the area was chosen based on bathymetry data that indicated that due to deeper water at that point, barges and ships can be brought in quite close to shore in that area. Additionally, the location of the MLA also corresponds well with the alignment of the winter ice road.[1203]

The Board notes that many of the preferred means of carrying out the Project chosen by Sabina such as tailings disposal and impoundment measures are based on methods and technologies widely used in other northern mines.[1204] The use of known technology increased the parties and the Board's confidence with Sabina's chosen alternatives and assurance in Sabina's predictions about the effects associated with these preferred alternatives.

With respect to the fundamental question of alternatives to the Project, the Board recognizes that the Project has the potential to deliver lasting positive economic benefits in the region, Nunavut, and possibly the Northwest Territories, but that these potential effects must be balanced against the potential for negative ecosystemic and socio-economic effects in these areas as well. As detailed in the several sections of the report, the Board has now concluded that the potential for the Project to have significant adverse ecosystemic and socio-economic effects can be addressed through the Proponent's compliance with the commitments made throughout the Board's review, as well as compliance with the Board's recommended terms and conditions.

6.3.4 Conclusions and Recommendations of the Board

In considering this issue, the NIRB acknowledges that Sabina's preferred means of developing the Project is appropriate. On the assumption that the Project is carried out in compliance with Sabina's commitments and the Board's recommended terms and conditions, the Board does not have any recommendations regarding alternative means of carrying out the Project or any of the specific Project components.

6.4 CUMULATIVE EFFECTS

An assessment of the potential for the Project to result in cumulative effects is required by Article 12,

[1202] R. Barry, Board staff, NIRB Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 80-81, lines 23-26 and lines 1-2; and W. Carson, Sabina Gold & Silver Corp., NIRB Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 81, lines 5-12.

[1203] R. Barry, Board staff, NIRB Final Hearing File No. 12MN036 Transcript, April 25, 2016, p. 81, lines 16-20; and W. Carson, Sabina Gold & Silver Corp., NIRB Final Hearing File No. 12MN036 Transcript, April 25, 2016, pp. 81-82, lines 23-26 and lines 1-5.

[1204] M. Pickard, Sabina Gold & Silver Corp., NIRB Final Hearing File No. 12MN036 Transcript, April 30, 2016, pp. 1387-1388.

Section 12.5.2 of the the Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada (*Nunavut Agreement*). For this Review specifically, the Minister of Aboriginal Affairs and Northern Development Canada (as he then was) expressly highlighted the importance of cumulative effects assessment for this Project in his correspondence of December 17, 2012 remitting the Project to the NIRB for review under Article 12, Part 5:

> The Back River Project proposal is one of many proposed and/or existing mines in the Kitikmeot Region. A thorough cumulative impacts assessment will be very important for the review. However, when assessing these impacts, I urge the Board to consider the Proposal in combination with reasonably foreseeable mine and transportation infrastructure developments.[1205]

Reflecting these requirements, Section 7.11 of the NIRB's Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River Project (EIS Guidelines), required the Proponent to assess the potential for cumulative effects to occur when the residual effects of the Project overlap and interact with the ecosystemic or socio-economic effects of other past, existing or reasonable foreseeable projects or activities.

In addition, as the Board expressed a lack of confidence in Sabina's ability to adequately mitigate the potential for cumulative effects on caribou and other terrestrial wildlife, such as grizzly bear, wolverine and muskox populations in the 2016 Final Hearing Report,[1206] cumulative effects was also a focus in the supplemental Final Hearing.

6.4.1 Views of the Proponent

In the Final Environmental Impact Statement (FEIS) the Proponent conducted cumulative effects assessments for only those Valued Ecosystem Components (VECs) or Valued Socio-Economic Components (VSECs) that had identified potential for negative Project-related residual effects—positive residual effects were not included in the assessment of cumulative effects.

Five (5) past projects (including two (2) gold mine projects in the Northwest Territories (NWT)), four (4) existing projects (including three (3) diamond mines in the NWT) and eight (8) reasonably foreseeable projects (including a diamond mine and a gold mine in the NWT) were included in the cumulative effects assessment.[1207]

The following VECs and VSECs were subject to cumulative effects assessment:

- Residual effects on air quality (for parameters including $SO_{2,}$, $NO_{2,}$,CO, TSP, $PM_{10,}$, and $PM_{2,.5}$);[1208]

[1205] Duncan, J., Minister of AANDC, Decision Re: Sabina Gold & Silver Corp.'s Back River project proposal, NIRB File No. 12MN036, December 17, 2012.
[1206] NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report) at Section 6.4, pp. 310-314.
[1207] FEIS, Volume 11, Table 1.3-1. Past, Existing and Reasonably Foreseeable Future Projects with the Potential to Interact with the Back River Project.
[1208] FEIS, Volume 4, Section 1.6.

- Noise and vibration (exceedance of night-time criteria for sleep at Goose camp, exceedance of peak sound pressure level for birds and wildlife due to blasting, and exceedance of night-time noise criteria for wildlife near winter ice roads and blast sites);[1209]
- Vegetation loss;[1210]
- Special landscape feature loss;[1211]
- Caribou;[1212]
- Grizzly Bears;[1213]
- Muskoxen;[1214]
- Wolverine and Furbearers;[1215]
- Migratory Birds (Upland Birds and Waterbirds);[1216]
- Raptors;[1217]
- Surface Hydrology (stream flows and lake volumes);[1218]
- Freshwater Quality (construction and decommissioning activities, mine and site contact water and explosives);[1219]
- Freshwater Sediment Quality (construction and decommissioning activities, mine and site contact water and explosives);[1220]
- Freshwater Fish (Lake Trout and Arctic Grayling);[1221]
- Marine Water Quality (propeller wash during shipping, runoff from mobilization, construction and decommissioning activities and site contact water);[1222]
- Marine Sediment Quality (propeller wash during shipping, runoff from mobilization, construction and decommissioning activities and site contact water);[1223]
- Marine fish/Aquatic Habitat (habitat losses due to Lightering Barge Terminal and Intake/Discharge pipes);[1224]

[1209] FEIS, Volume 4, Section 2.6.
[1210] FEIS, Volume 5, Section 4.6.
[1211] FEIS, Volume 5, Section 4.6.
[1212] FEIS, Volume 5, Section 5.6; and for greater detail see the discussion of the cumulative effects analysis specifically for caribou in this decision in Section 4.11: Terrestrial Wildlife and Wildlife Habitat - sections 4.11.1: Views of the Proponent and 4.11.2: Views and Concerns of Interested Parties.
[1213] FEIS, Volume 5, Section 6.6.
[1214] FEIS, Volume 5, Section 7.6.
[1215] FEIS, Volume 5, Section 8.6.
[1216] FEIS, Volume 5, Section 9.6.
[1217] FEIS, Volume 5, Section 10.6.
[1218] FEIS, Volume 6, Section 1.6.
[1219] FEIS, Volume 6, Section 4.6.
[1220] FEIS, Volume 6, Section 5.6.
[1221] FEIS, Volume 6, Section 7.6.
[1222] FEIS, Volume 7, Section 2.6.
[1223] FEIS, Volume 7, Section 3.6.
[1224] FEIS, Volume 7, Section 4.6.

- Marine fish community (Arctic Char);[1225]
- Seabirds/Sea ducks; [1226]
- Archaeology; [1227]
- Employment and Health and Community Wellbeing;[1228] and
- Land Use (changes in access to land and resources, changes to the experience of the natural environment, and changes to the abundance and distribution of resources).[1229]

On the basis of the cumulative effects assessment of these VECs and VSECs, the Proponent concluded:

> All identified residual cumulative effects were either of low magnitude, confined to a localized area, reversible, or shore term once mitigation and management measures were considered…Hence, the overall effect of the Project to act cumulatively with other past, present or reasonably foreseeable future projects on the atmospheric, terrestrial, freshwater, marine and human environments is determined to be Not Significant.[1230]

In the FEIS Addendum, the Proponent indicated that significant changes to the Wildlife Mitigation and Monitoring Program Plan (WMMPP) since the 2016 Final Hearing had been made to ensure that the WMMPP "…will be protective of caribou and other terrestrial wildlife, ensuring that the potential for Project-related and cumulative effects is minimized." [1231]

In addition, at the supplemental Final Hearing, Sabina highlighted several specific examples of measures taken to reduce the potential for the Project to contribute to cumulative effects as follows:

> *I'm going to give some examples of specifics now. With respect to cumulative effects, all of the Northwest Territories groups have identified concern for the potential of cumulative effects. Sabina has updated its mitigation and management to increase the protection of caribou and reduce project-specific effects. Also to reduce its contribution -- as a result, to reduce its contribution to cumulative effects. For instance, the Government of Northwest Territories and the North Slave Métis Alliance asked for a trigger of 4 kilometres for the shutdown of blasting, and we've done that. This is increased protection from the previously proposed maximum of 2.5 kilometres.*
>
> *Sabina has also committed to contributing to regional cumulative effects management and monitoring programs through Section 7.2.2.7 of the wildlife mitigation and monitoring plan*
>
> *In the final example, dust. North Slave Metis Alliance requested an additional dustfall monitoring at a greater distance from the program -- project. Sabina has updated the*

[1225] FEIS, Volume 7, Section 5.6
[1226] FEIS, Volume 7, Section 6.6.
[1227] FEIS, Volume 8, Section 1.6.
[1228] FEIS Volume 8, Section 3.6.
[1229] FEIS, Volume 8, Section 4.6.
[1230] FEIS, Volume 1, Executive Summary, p. xxxvii.
[1231] FEIS Addendum, Volume 5, pp. 50-58

wildlife mitigation and monitoring plan to include additional dustfall stations at a greater distance from the project site. This is covered under Section 7.2.2.6. .[1232]

Sabina also noted that following the release of the Board's 2016 Final Hearing Report, the Wildlife Mitigation and Monitoring Program Plan (WMMPP) was revised to address concerns expressed by parties that the 2016 WMMP was not sufficiently developed to be protective and adaptive to a sudden shift in caribou range that could include caribou returning to the area for calving and/or post-calving activities. In February 2017, the revised WMMPP was reviewed by third-party reviewers (consultants not involved in the development of the WMMPP) to assess the proposed program in terms of sufficiency, including assessing adaptability if caribou ranges shift and in future overlap the Project area. As summarized at the supplemental Final Hearing, the third-party reviewers reached the following conclusions:

What we did find unique in comparison to other wildlife mitigation and monitoring plans is that the project does not overlap with any caribou calving grounds; however, the wildlife mitigation and monitoring plan has substantial detail built into contingency plans to deal with caribou calving within the project area which does not currently occur. The wildlife mitigation and monitoring plan has built in contingencies for analyzing a potential shift in the Bathurst calving range, and there are triggers in place for planned and rapid operational shutdowns.

A large portion of the wildlife mitigation and monitoring plan is focused on these triggers and adaptive management for a scenario that may not ever occur. Furthermore, recent changes to the adaptive management triggers yield the plan even more conservative and protective of caribou.

In summary, we believe that the wildlife mitigation and monitoring plan has considered – has conservative adaptive management triggers that are protective of caribou, wildlife, and wildlife habitat and meets or exceeds best practices in the NWT and Nunavut for mining operations.[1233]

6.4.2 Views and Concerns of Interested Parties

Undoubtedly, throughout the Board's Review of the Project, as well as during both Final Hearings, the primary focus of cumulative effects concerns for all parties, including the Board was the potential for cumulative effects on caribou in terms of habitat loss, potential effects on caribou migratory patterns and potential effects on caribou during calving and post-calving. The potential for cumulative effects on caribou were viewed by some parties as so critical that they recommended that the Board not approve the Project. As stated by Łutsel K'e Dene First Nation at the 2016 Final Hearing:

Łutsel K'e Dene First Nation recommends that the NIRB take into consideration the current state of the Bathurst caribou herd and cumulative impacts within the herd's entire range when assessing the significance of habitat loss from the project, not simply look at this

[1232] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 358-359, lines 10-26 and line 1.

[1233] C. De La Mare, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, May 30, 2017, pp. 218-219, lines 15-26 and lines 1-11.

> *project –project suggested impact of 2,940 hectares. Łutsel K'e Dene First Nation recommends that it not approve this project based on the current state of the Bathurst caribou herd and need to protect the herd from any further disturbance until the herd rebounds.*[1234]

This view continued to be expressed in the written submissions of the Yellowknives Dene First Nation, (YKDFN) in their comments about the Project, even as updated by the additional assessment information and additional mitigation and monitoring measures proposed by Sabina in the FEIS Addendum and updated WMMPP. Although the YKDFN Chiefs acknowledged that Sabina had made improvements to their proposed mitigation measures since the 2016 Final Hearing, the YKDFN stated:

> During the first hearing, the Yellowknives Dene first Nation (YKDFN) opposed the project. It is our position that the Bathurst caribou herd cannot withstand any more incursions into its range. The herd is the primary herd from which the Yellowknives harvest, and its current decline has had a significant negative impact on the Nations wellbeing, livelihood, and connection to the land.
>
> …Without a significant rebound in herd numbers the Yellowknives fear that there will be irreparable harm to our communities. The continued expansion of mining operations across the Bathurst herd's range will only exacerbate an already dire situation.
>
> For the above reasons, YKDFN reasserts its initial opposition to the Sabina Back River project. Now is just not the time for a project like this.[1235]

Other parties noted that while they had concerns about the potential for cumulative effects on caribou as a result of the Project, by the conclusion of both Final Hearings many of these parties generally acknowledged that if the Proponent implemented the mitigation, monitoring and adaptive management measures as recommended by the parties and as included in the revised Wildlife Mitigation and Monitoring Program Plan filed with the Board in May 2017, such measures could be sufficient to limit the potential for, and significance of, the potential cumulative effects on caribou.[1236]

However, several parties noted that there must be on-going monitoring and adaptation to ensure that the measures proposed to be implemented by Sabina remain effective at limiting the potential for cumulative effects over the life of the Project. As identified by Community Representative, Harry Maksagak: "*There is no such thing as,* [:] *We will do this and it will be okay forever. As we said earlier, when you go to work, you expect the unexpected."* [1237] As stated by the Government of the Northwest

[1234] B. Sanderson, Łutsel K'e Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 709, lines 16-25.

[1235] Power, A., Regulatory and Research Specialist, Yellowknives Dene First Nation, Re: Environmental Assessment of the Sabina Back River Gold Project, April 26, 2017.

[1236] See for example J. Ottenhof, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 635-638 and Exhibit 92 filed in the NIRB 2016 Final Hearing File No. 12MN036 and S. Anablak, Kitikmeot Inuit Association, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 419; L. Kamermans, Government of Nunavut, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 403 and B. MacIsaac, Government of Nunavut, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 452; and A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 685-686 .

[1237] H. Maksagak, Cambridge Bay, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 682.

Territories at the 2016 Final Hearing,[1238] recognizing that the range of any given caribou herd may shift considerably over time, to ensure that cumulative effects to caribou do not occur over the course of the Project lifecycle, will require vigilant monitoring and contingency planning so that Sabina can respond to range shifts before adverse effects occur.

The Board and other participants in both Final Hearings sought specific detail regarding how Sabina's mitigation, management and monitoring plans would be able to adaptively manage the potential for effects should circumstances change, with several questions at the 2016 Final Hearing similar to the following:

> *What do you plan on doing if you notice you are impacting the caribou more than they already are impacted by other mining companies? What will you do to adapt your process for caribou if they are adapting -- or if they are impacting the caribou more than they already are impacted?*[1239]

In addition to the considerable focus on cumulative effects with respect to caribou and caribou habitat, interested parties also expressed concern throughout the Review for potential cumulative effects with respect to the following Valued Ecosystem Components (VECs) and Valued Socio-economic Components (VSECs):

- Muskoxen;[1240]
- Wolverines;[1241]
- Migratory Birds (including cumulative effects from shipping); [1242]
- Species at risk;[1243] and
- Effects on sea ice and marine mammals from shipping.[1244]

However, in contrast to the potential for cumulative effects on caribou, with respect to the potential cumulative effects on all other VECs and VSECs, parties indicated at the 2016 Final Hearing that they were satisfied that increased monitoring and adaptive management would likely be sufficient to ensure that cumulative effects are limited and mitigated if required.[1245]

[1238] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 682.

[1239] C. Westwood, Kugluktuk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1030, lines 15-20.

[1240] Government of Nunavut, Final Written Submission, GN-17, pp. 42-43.

[1241] Government of Nunavut, Final Written Submission, GN-18, pp. 43-44.

[1242] Environment and Climate Change Canada, Final Written Submission, ECCC #7. p. 8.

[1243] Environment and Climate Change Canada, Final Written Submission, ECCC #12, pp.18-20.

[1244] S. Qingnaqtuq, Kitikmeot Regional Wildlife Board, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, pp. 775-776.

[1245] See for example, the resolution of cumulative effects concerns of Environment and Climate Change Canada as noted by L. Ransom, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 454, lines 10-14.

6.4.3 Views of the Board

In the 2016 Final Hearing Report[1246] the Board generally accepted the positions of the Proponent and the parties that the potential for cumulative effects on all valued ecosystem components and valued socio-economic components other than caribou, grizzly bears, muskoxen, and wolverines could have been effectively managed by Sabina implementing the mitigation, monitoring and adaptive management measures proposed by the Proponent in the 2016 Wildlife Mitigation and Monitoring Plan. However with respect to potential for cumulative effects on caribou and listed terrestrial wildlife, based on uncertainty about the efficacy of monitoring and mitigation measures proposed, and uncertainty regarding how quickly the Proponent would be able to adapt to changed circumstances in terms of increases/decreases in caribou populations, changes to the geographical extent of overlap with the Project Development Area (PDA) or changes to the timing and use of the PDA by caribou and terrestrial wildlife, the Board was not confident that the potential cumulative effects on caribou, grizzly bears, muskoxen, and wolverines could be successfully managed if the Project were to go ahead.

The Board was particularly concerned that although caribou calving and post-calving grounds of the Bathurst and Beverly herds did not currently overlap with the PDA, the Proponent's 2016 Wildlife Mitigation and Monitoring Plan was not sufficiently protective and adaptive to respond to the significant shifts in ranges of these herds that communities and Inuit Qaujimaningit suggest are likely to occur in future. Given the fragile state of these herds, the Board had serious concerns that Sabina's plans may not be adequate to respond quickly if caribou once again return to areas overlapping with the PDA, and highlighted specific concern about what would happen if caribou calving grounds shifted to the Marine Laydown Area. [1247]

As recognized throughout the Board's Review of the Project, given the importance of caribou for all Inuit, as well as Aboriginal groups in the Northwest Territories, the absence of approved land use plans or robust cumulative effects strategies for managing the Bathurst herd, and recognizing the existing significant pressures on caribou populations in both Nunavut and the Northwest Territories from many sources, the Board must adopt the most stringent version of the precautionary approach to assessing the adequacy of the monitoring, mitigation and adaptive management of potential project-induced effects (including cumulative effects) on caribou.

In this regard, the Board recognizes that in the significant amendments to the Wildlife Mitigation and Monitoring Program Plan (WMMPP) following the 2016 Final Hearing, Sabina has added considerable detail to address the areas where Intervenors, Community Representatives and the Board had expressed a lack of confidence, including the following:

- More fully incorporating Inuit Qaujimajatuqangit and Traditional Knowledge into mitigation and monitoring plans;
- Defining specific adaptive management triggers for various mitigation and monitoring measures that would be undertaken if a shift in the caribou calving range of any herds results in overlap with the PDA;
- Significantly increasing Sabina's on-site monitoring for caribou and terrestrial wildlife; and

[1246] NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report) at Section 6.4, pp. 310-314.

[1247] P. (Omingmayok) Kadlun, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 340, lines 7-20.

- Committing to well-defined management actions that could include operational shut downs if necessary.[1248]

Although the Board recognizes that the Proponent and other participants in the supplemental Final Hearing may have found it unusual that Sabina was required to spend considerable focus on designing mitigation, management and monitoring measures to limit the potential for effects on caribou populations that do not currently overlap the PDA, in the Board's view, the most stringent standard of the precautionary approach warrants this focus, level of preparedness and commitment to limiting the potential for project-induced cumulative effects on caribou and other terrestrial wildlife. Based on all the evidence heard by the Board throughout the Review there is no doubt that the caribou populations that have, according to Inuit Qaujimaningit overlapped and may once again overlap the PDA in future are in decline, are vulnerable to further disturbance and are of critical importance to Inuit in Nunavut and Aboriginal communities in the Northwest Territories. These factors mean that before the Board would approve the Project to proceed, the Board must have a high level of confidence that the potential for project-induced effects on caribou and other terrestrial wildlife can be mitigated.

The Board commends Sabina and all parties who contributed to the significant and substantive revisions to the Wildlife Mitigation and Monitoring Program Plan (WMMPP) to produce a much more comprehensive, conservative, protective and adaptive plan. In particular, the Board notes that the clear thresholds, concrete management actions, including operational shutdowns, combined with a more robust on-site monitoring program all provide the Board with greater confidence that Sabina will be able to minimize the potential for effects, including cumulative effects on caribou and other terrestrial wildlife, even if significant shifts in caribou migration, calving and post-calving occur. However, the development of a robust plan is only the first step to ensure that the substantial revisions to the WMMPP deliver a high level of protection and adaptive management, and requires that the WMMPP be fully implemented and adapted throughout the Project lifecycle to reflect changing circumstances. As noted by the Government of Nunavut at the supplemental Final Hearing:

> *The Government of Nunavut has increased confidence in the ability of the proponent to minimize the project's effects on the terrestrial environment, in particular, caribou, through mitigation and adaptive management. This assessment assumes the plan is fully implemented and functions effectively in the manner intended.*[1249]

Accordingly, the Board has recommended terms and conditions applicable to the on-going development, implementation and revision of the WMMPP considered necessary to maintain its effectiveness.

6.4.4 Conclusions and Recommendations of the Board

The Board has no specific recommendations in respect of cumulative effects management; however, as outlined in greater detail in Section 4.11.4: Terrestrial Wildlife and Wildlife Habitat, resulting from the significant revisions to the Wildlife Mitigation and Monitoring Program Plan undertaken by Sabina in consultation with the Intervenors and affected communities following the 2016 Final Hearing which

[1248] For a detailed discussion of the amendments to the Wildlife Mitigation and Monitoring Program Plan, see Section 4.11.4.

[1249] B. MacIsaac, Government of Nunavut, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 452, lines 14-20.

reflect highly protective and precautionary approach to the management of potential effects on caribou, the Board is now confident that the implementation monitoring, mitigation, and adaptive management measures will be sufficient to prevent and limit the potential for cumulative effects. The Board has also concluded that measures to limit the potential for cumulative effects on grizzly bear, wolverine, and muskox populations are also now sufficient to mitigate the potential for adverse cumulative effects on these species.

6.5 REGULATORY CAPACITY AND CO-OPERATION

6.5.1 Views and Concerns of Interested Parties

During the 2016 Final Hearing representatives of the Łutsel K'e Dene First Nation and the Yellowknives Dene First Nation indicated that in the experience of their communities, monitoring for negative effects and maximizing benefits associated with mines requires effective oversight and mechanisms to ensure mine owners/operators fulfill the commitments made and relied upon during the regulatory process. As stated by, Łutsel K'e Dene First Nation:

> *… when the mine started in our hometown – our home community, our homeland…they promised that there's going to be lots of jobs and there's going to be people working and it's going to be – nothing's going to happen to the caribou, but that doesn't – that's not the picture today. Today we have no caribou, just a few people working in the mine, still – we still have housing issues, community issues, and my community we're struggling with…when you are making recommendations to the people or to the mine, if they – they've got to make sure you get a good deal …*[1250]

In response, the Kitikmeot Inuit Association (KIA) noted that the enforcement of commitments in the Nunavut regime is not solely dependent on regulatory agencies, but is also shared by the KIA as the landowners:

> *We are confident this company will keep its promises. KIA has all the tools necessary to deal with any situation where Sabina's performance falls short of our expectations.*
>
> *The situation for* [an] *Inuit association in Nunavut with a mandate based on* [the] *Nunavut land claims agreement is simply different from* [the] *experience of the Yellowknives Dene First Nation.*[1251]

In addition to highlighting the importance of regulatory and landowner oversight mechanisms to maximize the benefits of the Project and minimize the potential for project-induced adverse effects, several parties also noted that maintaining a co-operative and consultative approach with all interested parties is critical to not only assessing effects but also monitoring, mitigating and adaptively managing effects as they arise.[1252]

[1250] B. Sanderson, Łutsel K'e Dene First Nation, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, pp. 713-714, lines 17-26 and lines 1-13.

[1251] P. Emingak, Kitikmeot Inuit Association, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1343, lines 1-14.

[1252] See for example, the closing remarks of S.Shiga, North Slave Métis Alliance, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1297, lines 4-12.

At the supplemental Final Hearing, the Board also heard Community Representatives questioning Sabina regarding their plans to ensure potentially affected communities receive on-going communication about the Project and potential for project-induced effects.[1253] In response, specifically with respect to monitoring data, Sabina indicated:

> *…obviously there is a huge amount of monitoring required for everything from terrestrial wildlife, to water, to fish, to air quality; and those monitoring programs go on for a very long period of time. So if we ever identified a significant issue, we would again be notifying groups, and then our standard monitoring would always be contained within our annual reports. And, of course, we would be also disseminating that information -- giving that information of that*
> *long-term monitoring to the communities when we're back in there, as we've already committed to as part of the consultation record.*[1254]

In addition to the Proponent's commitments with respect to the monitoring, mitigation and management of the potential for effects on caribou, the Board heard from the Government of the Northwest Territories (GNWT) during the 2016 Final Hearing that the GNWT was participating in at least five (5) collaborative processes with the Government of Nunavut (GN), the Nunavut Wildlife Management Board, the Nunavut Planning Commission, the Tłı̨chǫ Government, Wek'eezhii Renewable Resources Board and various other authorities in the Northwest Territories and Nunavut all directed at managing the Bathurst caribou herd.[1255] At the supplemental Final Hearing, the Government of Nunavut also filed a recently signed Memorandum of Understanding between the GN and GNWT that formalizes the collaboration of the two Governments in terms of conducting joint wildlife research and management for the Bathurst caribou herd.[1256]

During their review of Sabina's FEIS Addendum, the Government of Nunavut also recommended the establishment of a specific caribou technical advisory group to: "*provide a transparent mechanism for testing and evaluation of the project's caribou monitoring and adaptive management measures*."[1257]

6.5.2 Views of the Board

During the 2016 Final Hearing, the Board staff sought clarification on some very specific points with respect to the role and capacity of regulatory agencies to provide oversight in respect of Sabina's particular regulatory obligations. For example, Board staff requested clarification on whether Environment and Climate Change Canada (ECCC) contacts the shipping companies operating within the Nunavut settlement area to ensure they are aware of and avoid sensitive habitat for marine wildlife when developing initiative plans for annual community resupply, or alternatively, whether ECCC has any

[1253] B. Maksagak, Cambridge Bay, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 877-878.
[1254] M. Pickard, Sabina Gold & Silver Corp., NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 879, lines 4-15.
[1255] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 678-681.
[1256] See Exhibit 95 filed by the Government of Nunavut in the NIRB Supplemental Final Hearing File No. 12MN036 and the description of the Memorandum of Understanding provided by B. MacIsaac, Government of Nunavut, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, pp. 899-900.
[1257] B. MacIsaac, Government of Nunavut, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, June 3, 2017, p. 898.

direct liaison with the Government of Nunavut or others that contract these services.[1258] ECCC indicated that it provides comments through the Nunavut Land Use Planning process and through the environmental assessment process but not directly to shipping companies.[1259]

In addition, a Board Member[1260] and Board staff inquired at the 2016 Final Hearing as to the capacity of responsible government agencies to respond to a fuel spill occurring during project-related shipping, asking if:

> *… the Canadian Coast Guard could respond to whether or not they would have the capacity and capability to address potential fuel spills from planned shipments associated with this project within Bathurst Inlet. So that would indicate to us that they've taken a look at the proposed shipping that's associated with this project and are able to respond to whether or not they currently have the capacity and capabilities to address an incident, should one occur and the shipper be unknown, unwilling, or unable to clean up the fuel themselves.*[1261]

In the 2016 Final Hearing Report, the Board noted that the response of the Canadian Coast Guard (CCG) (as provided by the Fisheries and Oceans Canada representative attending at the 2016 Final Hearing) was essentially that as the CCG's vessels in the Arctic carried out a variety of duties, the CCG could not specify if and when a CCG vessel would be able to respond to a fuel spill in Bathurst Inlet near the Marine Laydown Area if the Proponent was unable to respond.[1262] The Board went on to note that as of the 2016 Final Hearing, there were no certified Response Organizations (as defined under the *Canada Shipping Act, 2001*[1263]) in proximity to the Region that could be relied on by Sabina to provide additional emergency response capacity if there was a fuel spill in Bathurst Inlet. Although Sabina provided additional information regarding the spill response capability of a private spill response contractor, the Mackenzie Delta Spill Response Corporation (MDSRC),[1264] the central questions of the communities along the shipping route regarding CCG's capacity to respond to a fuel spill if the Proponent were unable or unwilling to marshal a response remains.

In addition to questions about the regulatory capacity to meet specific regulatory obligations, as in past reviews, the Board has heard concerns regarding the capacity of regulators to participate fully on project working groups responsible for the development and implementation of effects monitoring, mitigation, and management functions, as well as ensuring sufficient capacity to provide an appropriate level of regulatory oversight for a project once it has been approved to proceed and once the initial permitting phase is completed.[1265] The Board specifically highlights for all parties, that the effective implementation and adaptation of critical components of the enhanced Wildlife Mitigation and

[1258] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 462, lines 1-13.
[1259] J.F. Dufour, Environment and Climate Change Canada, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 26, 2016, p. 462, lines 14-19.
[1260] A. Maghagak, Board Member, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 538, lines 13-21.
[1261] R. Barry, Board staff, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 27, 2016, p. 548, lines 11-22.
[1262] NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report) at Section 6.5, p. 317.
[1263] S.C. 2001, c. 26, ss. 165 and 169.
[1264] See Section 6.2 Accidents and Malfunctions Assessment for a summary of the additional information provided about the addition of MDSRC's spill response capability.
[1265] See for example the Board's discussion of this issue as included in Section 6.4 Regulatory Capacity in NIRB File No. 08MN053, Final Hearing Report for the Mary River Project, Baffinland Iron Mines Corporation, September 14, 2012, pp. 227-229.

Monitoring Program Plan (WMMPP) in respect of caribou management is premised on the assumption that the Proponent and all other parties will allocate sufficient resources as may be required to actively participate as members of the Inuit Environmental Advisory Committee and the Caribou Technical Advisory Group.[1266]

Although the Board notes that key parties such as the Kitikmeot Inuit Association, Government of Nunavut and local hunters and trappers organizations indicated their initial support for these initiatives, the Board notes that a variety of financial and human resource issues can arise over the course of a project's lifecycle that can significantly hamper the capacity of participants to continue with these important commitments. As stated by the Board in the 2016 Final Hearing Report, the Board continues to have concerns that with an unprecedented number of on-going initiatives for caribou management at local, regional, and transboundary scales the failure of any of the central regulatory agencies, landowners, First Nations, Inuit, community members, and researchers to fulfill their roles on an on-going basis could jeopardize the successful implementation and adaptation of the Proponent's proposed mitigation, management, and monitoring programs.

6.5.3 Conclusions and Recommendations of the Board

Although the Board has not recommended specific Terms and Conditions under this heading, the Board wishes to acknowledge that throughout the Board's recommendations under specific Terms and Conditions there are many recommendations that include references to the ongoing cooperation and collaboration required to ensure that the Project can be carried out in a manner that does not result in significant, unmitigable adverse ecosystemic and socio-economic effects. It should be noted by all parties that if, during the monitoring of the Project, the Board identifies that the failure of any parties to fulfill their advisory roles is hampering the effectiveness of these programs, the Board may, on its own initiative, revisit the terms and conditions of the Project Certificate to ensure that the Board's objectives continue to be met.

6.6 PERFORMANCE BONDING

As established under Article 12, Section 12.5.5 (f), of the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada* (*Nunavut Agreement*) the NIRB shall, when reviewing any project proposal, take into account all matters that are relevant to its mandate, including whether the Board should require the posting of performance bonds. In assessing the extent to which performance bonding is required, the Board considers the Proponent's current financial capacity and prior mine development experience, the costs of developing and reclaiming the Project and the jurisdiction and requirements of regulatory authorities, mineral tenure holders and landowners involved in the subsequent permitting phase of project development to secure an amount (through various instruments such as the water licence, offsetting plans, land and production leases) to cover the costs of reclaiming the Project.

In the 2016 Final Hearing Report, the Board declined to make any recommendations regarding requirements for Performance Bonding and recognized that the detailed assessment of the Proponent's reclamation security estimates would be conducted during the Nunavut Water Board water licensing process and the negotiation of land tenure agreements if the Project had been approved to proceed. However, based on the publicly available information in 2016, the Board did express the following:

[1266] As described in Exhibits 85-88 filed in the Supplemental Final Hearing File No. 12MN036, Slides 27-29.

…the Board has some reservations regarding the existing financial capacity of the Proponent to bring the Project forward in a manner that reflects all of the commitments made as well as continuing to fulfill the mitigation, monitoring, and adaptive management that would have been required to carry out the Project. [1267]

6.6.1 Views of the Proponent

The updated publicly available financial information provided by the Proponent to the end of March 31, 2017 indicates that Sabina Gold & Silver Corp. (SBB: TSX) has taken steps to raise additional capital since the 2016 Final Hearing. According to the summary of 2017 Q1 Highlights in the Proponent's most recent Financial Statement filed with the Toronto Stock Exchange, as of March 31, 2017 Sabina's cash and cash equivalents and short-term investments were $43.1 million, an increase from the $16.4 million previously secured as of March 31, 2016. [1268]

With respect to the costs of developing the Project, the Proponent's estimate contained in the original FEIS was not changed by the FEIS Addendum, with the capital expenditures required to develop the Project predicted to be approximately $1.1 billion as follows:

> Capital expenditures (CAPEX) for the Mobilization and Construction (pre-production) phase are estimated at $694.7 million…Capital Expenditures during Operation (production) total an additional $440.4 million…for a total CPEX of approximately $1,135.1 million.[1269]

In addition to updated publicly available financial information about Sabina, in association with the supplemental Final Hearing, Sabina brought a motion (that was granted by the Board)[1270] to provide the Board with confidential information regarding potential project financing options available to the Proponent to develop the Project.

Sabina noted in the FEIS that a more refined Mine Closure and Reclamation Plan (MCRP) and associated closure and reclamation cost estimate would be presented as part of the Nunavut Water Board's Type "A" Water Licence Application process if the Project was approved to proceed to the permitting phase; but did provide an initial site reclamation cost estimate in the draft MCRP of between $50 – 70 million.[1271] As summarized in the FEIS Addendum, as there were no areas of concern regarding the reclamation and closure plans and associated cost estimates raised by the Board in the 2016 Final Hearing Report, the Proponent did not provide any new or updated information in respect of these estimates in the FEIS Addendum.[1272]

In addition to the closure and reclamation cost estimate to be secured under the Water Licence, Sabina also noted at the 2016 Final Hearing that future discussions with the Kitikmeot Inuit Association about

[1267] NIRB File No. 12MN036 Final Hearing Report for the Back River Project, Sabina Gold & Silver Corp., June 15, 2016 (2016 Final Hearing Report) at Section 6.6.3, p. 321.
[1268] Sabina Gold & Silver Corp., Condensed Consolidated Interim Financial Statements (unaudited), First Quarter ended March 31, 2017, Management's Discussion and Analysis, March 31, 2017 at p. 1.
[1269] FEIS, Volume 8, Section 3.5.3, p. 3-49.
[1270] See the discussion of the Motion included in this revised Final Hearing Report in Section 1.9.2, The Disposition of Motions at the Supplemental Final Hearing.
[1271] FEIS, Volume 9, Mine Closure and Reclamation Plan, Section 7.
[1272] FEIS Addendum, Volume 2, pp. 2-3.

reclamation security required under land tenure instruments and/or the Inuit Impact Benefit Agreement (IIBA) remained to be discussed:

> *Should the Board recommend the project to proceed to the next stage, one future task will be setting the reclamation bond that we will have to pay to the Kitikmeot Inuit Association and Indigenous and Northern Affairs to make sure that we clean up the mine when we're done. The Kitikmeot Inuit Association and the Minister will not release those bond dollars until it is done and done properly.*[1273]

In the FEIS Addendum, Sabina indicated that in 2016, the Proponent formally commenced negotiations with the KIA to develop a non-binding term sheet that will form the basis for the completion of the land tenure and Inuit Impact Benefit Agreement terms to govern the Project. Reclamation obligations and security requirements have been included as a key term of the Sabina and KIA non-binding term sheet.[1274]

6.6.2 Views and Concerns of Interested Parties

None of the Intervenors, Community Representatives or members of the public participating in the NIRB's review and making representations at either the 2016 Final Hearing or the supplemental Final Hearing requested that the Board require the Proponent to post a performance bond as part of the NIRB assessment. However, within its final written submission in advance of the 2016 Final Hearing, the Kitikmeot Inuit Association (KIA) commented on the following five (5) scenarios provided by Sabina, noting that each could impact the Proponent's ability to undertake proposed mitigation and management measures:

- significant drop in gold price;
- collapse of global markets;
- change in ownership;
- limitations to site access; and
- economic stability. [1275]

The KIA noted that the scenarios were all highly feasible and that there was a lack of detail on how associated changes would potentially modify mitigation and monitoring measures. The KIA requested that Sabina provide details on the specific mitigation, management, and monitoring plans that could be affected by each scenario, including an indication of which plans would be considered essential for the continued operations of the Project. Within its response, Sabina noted that if approved the Project would operate within the terms and conditions of a NIRB project certificate and various authorizations, including compliance with management plan obligations.[1276] Sabina committed to implementing effective management, mitigation, and monitoring measures and to using updated adaptive management approaches to ensure mitigation measures would be optimized or modified during the Project's lifecycle.

[1273] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1393, lines 11-18.
[1274] FEIS Addendum, Volume 3, p. 3-3.
[1275] Kitikmeot Inuit Association, Final Written Submission, March 10, 2016.
[1276] Sabina Gold & Silver Corp., Response to Final Written Submissions, March 31, 2016.

In Sabina's introductory remarks at the supplemental Final Hearing, Sabina reiterated this commitment:

> *Sabina has worked hard to ensure that this project is constructed, operated, and closed in the most responsible way. Although we were disappointed by the Board's previous recommendation, ultimately, we believe it has resulted in a better, stronger, more protective project that will foster the current and future well-being of the land and the people of Nunavut. We will ensure that our commitments are implemented through the life of mine and beyond.*[1277]

During the 2016 Final Hearing Community Representatives identified that along with the economic benefits of the Project there must be mechanisms in place to ensure that the environmental protection commitments made by Sabina are followed through:

> *Safety is a very big thing to us 'cause it provide us food for our animals, caribous, anything that lives in our land 'cause if it gets damaged our food source will be gone forever in our area…I'd like to see young people work 'cause majority of the north is not working. But I have a mixed feeling of hearing from other Metis, too, like what damage has done to their land. Like, it made me think twice to see what happened to their land. Like, that's why safety is very high for me. Like, have you guys done any research properly. Do we believe that? Like, after hearing some different stories, like, sometimes it's hard to believe.*[1278]

During the supplemental Final Hearing, Community Representatives also raised the question of what would happen if Sabina sold the Project to another company to develop the mine. Sabina responded with the following:

> *And last statement with respect to another company. Just so it's clear to everyone in the room, Sabina intends to build and operate Back River. That is our intention. We've permitted the mine fully with that in mind. All the commitments have been looked at from a financial capacity standpoint. You know, can they actually happen? And, you know, that -- that is the objective. If something was to change, somebody was to take Sabina over, they would have to meet the same legal requirements; the same project certificate requirements; should we have a positive decision, the same permitting requirements. They essentially inherit everything we said we would do, and that's kind of part of that transaction.* [1279]

In the 2016 Final Hearing, in the context of noting the difficulties in maintaining balance between economic and environmental considerations, Sabina noted that the project design takes potential risks into account and also noted the role of regulatory authorities and use of checks and balances, such as closure bonding to ensure Sabina meets their commitments.[1280]

[1277] N. Hoeller, Sabina Gold & Silver Corp., reading the statement of B. McLeod, NIRB Supplemental Final Hearing File No. 12MN036 Transcript, May 30, 2017, pp. 48-49, lines 19-26 and lines 1-3.

[1278] B. Immingark, Kugaaruk, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, pp. 839-840, lines 20-26 and lines 1-7.

[1279] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 2, 2017, p. 789-790, lines 23-26 and lines 1-11.

[1280] M. Pickard, Sabina Gold & Silver Corp., NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 30, 2016, p. 1393, lines 11-18.

In the 2016 Final Hearing Community Representatives also questioned Sabina regarding the Proponent's obligations to set aside money for reclamation of the mine before mining begins:

> *I would like to know if you guys have any reclamation plans. And once you answer that question, I'd like to know, if you do have reclamation plans, if you have money in place already to rebuild the land the way it was before you start mining.*[1281]

In response, Sabina noted that although the preliminary draft of the closure and reclamation plan has been prepared for the assessment phase, if the Project were approved to proceed, during the licensing phase, as well as during the negotiation of an Inuit Impact and Benefit Agreement under Article 26 of the *Nunavut Agreement*, an in-depth analysis of the security required to reclaim the site will be conducted as part of these processes. Sabina also indicated they would be expected to post the reclamation security during that regulatory phase; well in advance of any mining taking place.[1282]

6.6.3 Views of the Board

As indicated in the 2016 Final Hearing Report, the Board shares the expectation of all the participants in the regulatory process that the Proponent will have in place, and will maintain over the course of the Project's lifecycle, the financial capacity to meet all of the obligations and commitments made by the Proponent during the Board's review and that would govern the Project throughout the project life phases. At the assessment stage, the Board is particularly focused on the Proponent's capacity to undertake the required effects mitigation, monitoring and adaptive management that is central to the mitigation of potential project-induced effects.

Based on the updated publicly available information and the confidential information provided by the Proponent, the Board is now confident that the Proponent not only has the intention, but also the financial capacity to bring the Project forward in a manner that reflects all commitments Sabina has made as well as fulfilling the mitigation, monitoring, and adaptive management that will be required to carry out the Project. In coming to this conclusion, the Board also notes the tangible progress identified by both the Kitikmeot Inuit Association and Sabina in terms of the land tenure and Inuit Impact Benefit Agreement negotiations.

The Board also expects that in addition to the KIA's land tenure negotiations, the Nunavut Water Board's water licensing process will engage in the detailed assessment of the amount of reclamation security that would need to be in place to secure proper closure and reclamation of the Project.

6.6.4 Conclusions and Recommendations of the Board

Having duly considered the Proponent's current financial capacity, the general estimate included in the preliminary closure and reclamation planning conducted to date and recognizing that these global estimates will be further refined by the Proponent and examined further by interested parties in much greater detail if the Project were to proceed to subsequent licensing and permitting processes, the Board does not have any recommendations regarding performance bonding requirements for the Project.

[1281] J. Tikkiruq, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 919-920, lines 25-26 and lines 1-4.

[1282] W. Carson, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 28, 2016, p. 920, lines 5-24.

6.7 TRANSBOUNDARY EFFECTS

Transboundary effects were highlighted as an issue of particular concern in the Minister's correspondence remitting this Review to the NIRB as follows:

> Given the Proposal's close proximity to the Bathurst caribou calving ground, it is essential that the scope of the Board's review also include consideration of transboundary impacts upon affected communities and groups who depend upon this resource. I therefore suggest that the Board pay particular attention to encouraging the participation of these groups in the review so that the potential impacts and proposed mitigation measures can be thoroughly understood.[1283]

In addition, as a central factor in the Board's 2016 recommendation not to allow the Project to proceed was concern about the potential for significant and unmitigable effects (including transboundary effects) on caribou, further discussion of the potential for transboundary effects on caribou also figured prominently in Sabina's FEIS Addendum, the technical review comments and final written submissions of Intervenors and the comments and concerns identified by Community Representatives and members of the Public during the supplemental Final Hearing.

6.7.1 Views of the Proponent

As with the Proponent's cumulative effects assessment, in the original Final Environmental Impact Statement (FEIS) the Proponent included a transboundary assessment chapter for only those Valued Ecosystem Components (VECs) and Valued Socio-Economic Components (VSECs) that the initial effects assessment identified as having a residual effect with the potential to interact with projects and activities outside of the Nunavut Settlement Area (NSA).[1284]

Applying this approach, Sabina included transboundary effects assessment for the following VECs in the original FEIS:

- *Air Quality* – Sabina noted that, contingent on the application of specific mitigation measures, the potential residual effects identified in its assessment for air quality would remain within the Local Study Area and would not be significant, nor would they contribute to cumulative or transboundary impacts.[1285]
- *Noise and Vibration* – Sabina concluded that the residual effect identified for noise and vibration is expected to remain within the three Project Development Areas, which are all located within Nunavut; therefore, no transboundary effects on noise are predicted.[1286].
- *Hydrological Features and Hydrogeology* – Sabina noted that given that the Project's potential residual effects would be confined to the LSA, no cumulative or transboundary effects would be expected on hydrology.[1287]

[1283] Duncan, J., Minister of Aboriginal Affairs and Northern Development, Decision Re: Sabina Gold & Silver Corp.'s Back River project proposal, NIRB File No. 12MN036, December 17, 2012.
[1284] FEIS, Volume 9, p. 1-53.
[1285] FEIS, Volume 4, Section 1.7.
[1286] FEIS, Volume 4, Section 2.7.
[1287] FEIS, Volume 6, Section 1.7.

- *Groundwater and Surface Water Quality* – Sabina determined, contingent on the application of mitigation measures, that the potential residual effects would be not significant, and further determined that they would not contribute to cumulative or transboundary effects as the non-significant Project residual effects for freshwater water quality are expected to remain confined to the Local Study Area (LSA).[1288]
- Sediment Quality – Sabina predicted that all potential residual effects on freshwater sediment quality would be restricted to within the LSA and therefore would not contribute to cumulative or transboundary effects.[1289]
- Freshwater Aquatic Environment – Sabina indicated, contingent on the application of mitigation measures and the balancing of all fish bearing habitat losses, that no residual, transboundary, or cumulative effects would be expected on the valued ecosystemic components for freshwater fish/aquatic habitat and freshwater fish community.[1290]
- Vegetation – Sabina concluded that as all potential Project and cumulative residual effects from loss and/or degradation of vegetation and special landscape features are expected to remain within the Potential Development Area(s) (PDAs), Local Study Area (LSA), or Regional Study Area, (RSA), all of which are within Nunavut, no transboundary effects would occur.[1291]
- Birds and Bird Habitat – Due to the limited spatial extent of the predicted residual effects, Sabina did not expect that the potential residual effects for all birds and bird habitat (including waterbirds and upland birds; raptors; and seabirds and seaducks) from the Back River Project would contribute cumulatively with other projects, or to create any transboundary impacts as these effects would be confined to the wildlife LSA.[1292]
- Marine Environment – Sabina predicted that of the three non-significant Project residual effects on the marine environment, all would be confined to the LSA, so no transboundary impacts would be created. With respect to the effects from shipping that could occur outside of the LSA and RSA, Sabina noted that as shipping will occur in established commercial and international shipping lanes, the Project shipping is unlikely to cause residual effects outside the LSA and RSA.[1293]
- Marine Wildlife – Although Sabina indicated that the potential residual effects of habitat loss identified for the marine fish community could act cumulatively with two (2) future projects; Sabina assessed this effect to not be significant. Based on the limited spatial extent of all residual and cumulative effects, Sabina predicted that there would be no transboundary effects on marine wildlife.[1294]
- *Terrestrial Wildlife and Wildlife Habitat* – Sabina's assessment of project-induced effects on terrestrial wildlife species resulted in the predicted occurrence of the following residual effects:
    - Habitat Loss (caribou, grizzly bear, muskox, wolverine, grey wolf);

[1288] FEIS, Volume 6, Section 4.7.
[1289] FEIS, Volume 6, Section 5.7.
[1290] FEIS, Volume 6, Section 6.7.
[1291] FEIS, Volume 5, Section 4.7.
[1292] FEIS, Volume 5, Section 9.7.
[1293] FEIS, Volume 7, Section 2.7.
[1294] FEIS, Volume 7, Section 4.7.

- Disturbance due to noise (caribou, grizzly bear, muskox, wolverine, grey wolf);
- Attraction (grizzly bear, wolverine); and
- Reduction in reproductive productivity (caribou, grizzly bear, muskox, wolverine).

Sabina predicted, contingent on the application of mitigation measures, that the significance of all potential residual effects would be not significant. For each wildlife species assessed, Sabina also conducted cumulative effects assessments (CEA) for all predicted residual effects identified as having potential interaction with past, present, or foreseeable developments in Nunavut and the Northwest Territories (NWT). Sabina determined, based on Sabina's expectation that other projects would have mitigation measures similar to those proposed for the Back River Project, that the significance of all potential residual cumulative, and transboundary effects would not be significant.[1295]

As with the cumulative effects assessment, the Proponent included a transboundary assessment chapter for only those Valued Socio-Economic Components (VSECs) where residual effects with the potential to interact with projects and activities outside of the Nunavut Settlement Area (NSA) were predicted.[1296]

On this basis, Sabina conducted a transboundary effects assessment for the following VSECs:

- *Employment* – Sabina discussed the potential transboundary impacts from increased competition for labour. Sabina predicted that the Back River Project could also result in negative transboundary effects by affecting the labour supply in Yellowknife, Northwest Territories, as it expects "a number of" employees to be city residents. Sabina developed mitigation measures to address potential project-induced residual, residual cumulative, and transboundary effects resulting from competition to labour. Mitigation measures were focused on developing the labour force and assisting communities to manage and prepare for expected increases in demand for labour through informing businesses, organizations, and hamlets throughout the RSA of its hiring requirements, schedule, and procurement practices prior to the commencement of the mobilization and construction and operation phases. Sabina stated that through specific measures, which were detailed within the Human Resources and Community Involvement plans, individuals and employers would be enabled to make informed and proactive decisions with respect to careers and staffing.[1297]
- *Traditional Activity and Knowledge* – Sabina predicted that the Project would not result in residual transboundary effects related to increased access to land and resources in the Kitikmeot region, due in part to the proposed mitigative design feature of only using winter ice roads, which would be used seasonally and would not be available for public use. Sabina predicted that the Project would not have a residual transboundary effect on subsistence harvesters as a result of changes to the distribution and abundance of resources, specifically the Ahiak and Bathurst caribou herds. Although Sabina expects changes in the distribution of caribou (see Section 4.11: Terrestrial Wildlife and Wildlife Habitat), it did not anticipate a reduction in the caribou population within the RSA attributable to the Project. On this basis, the Proponent predicted that there would be no changes to land use activities of harvesters

[1295] FEIS, Volume 5, Section 5.7 (caribou), Section 6.7 (grizzly bear), Section 7.7 (musk ox), and Section 8.7 (wolverine and grey wolf).
[1296] FEIS, Volume 9, p. 1-53.
[1297] FEIS, Volume 8, Section 3.7.

residing in the North Slave Region that rely on the Bathurst and Ahiak caribou herds due to project-induced transboundary effects.

- Heritage Resources – Sabina concluded that the Project would not result in cumulative or transboundary effects to the VSEC archaeological sites.[1298]
- Health and Wellbeing – Sabina concluded that the Back River Project would result in both positive and negative residual, cumulative, and transboundary effects on health and community wellbeing through changes to life skills, individual and family spending, and family and household function as a result of increased incomes.[1299]
- *Individual and Family Spending* – Sabina predicted that the Back River Project could result in transboundary effects for employees and their families who reside in small northern communities outside of the Nunavut Settlement Area, and would be less applicable for families residing in large urban centres. Using a precautionary approach, Sabina developed mitigation and enhancement measures to address potential project-induced residual, residual cumulative, and transboundary effects to health and community wellbeing resulting from changes to individual and family spending. Sabina clarified that with the exception of measures specifically targeted at Inuit from the Kitikmeot region, proposed measures would apply to all project employees. Sabina expected that other projects contributing to cumulative impacts would utilize similar mitigation strategies. Employees would have access to a number of services including an Inuit employment and training coordinator, counsellors, and a financial management program. The objective of these services was noted to facilitate Inuit inclusion in mine employment in a way that is complimentary to Inuit culture and sustainable. Sabina noted that it would enforce a zero tolerance rule related to alcohol and drug use and that regionally available programs and counselling would remain available to Project employees.[1300]
- *Family and Household Structure* – Sabina predicted that due to the importance and value placed on the family unit in Inuit culture, predicted project-induced changes to family and household structure could result in negative residual, cumulative, and transboundary effects. Sabina discussed proposed mitigation measures that would promote worker wellbeing, including: ensuring employees can communicate with their spouses while on-site, access to an Inuit employment and training coordinator, intercultural awareness training provided to all employees, and provision of an employee and family assistance program. Sabina further discussed its proposed socio-economic monitoring program that would utilize an adaptive management approach and through which Sabina would monitor, review, analyse, and report on a number of socio-economic indicators important to Kitikmeot residents to be monitored throughout the life of the Project.[1301]
- *Human Health and Environmental Risk Assessment* – It was further anticipated that potential effects would be not significant and that there would be no anticipated project-induced residual, cumulative, or transboundary effects.

[1298] FEIS, Volume 8, Section 1.7.
[1299] FEIS, Volume 8, Section 3.7.1.
[1300] FEIS, Volume 8, Section 3.7.2.2.
[1301] FEIS, Volume 8, Section 3.7.2.2.

In the Proponent's FEIS Addendum, Sabina noted that:

> As summarized in FHR-NIRB-4.11 of this FEIS Addendum, the updated WMMPP will be protective of caribou and other terrestrial wildlife, ensuring that the potential for current or future Project related residual effects on wildlife is minimized. Sabina is of the view that with the additional management and mitigation measures outlined in the updated WMMPP, the Project as proposed does not pose a risk of significant transboundary effects on caribou.[1302]

In addition, at the supplemental Final Hearing Sabina outlined the specific measures that the Proponent had agreed to build into the Project to adequately address the potential for transboundary effects:

> *The first specific change Sabina made to respond to this concern is Sabina's new objective for the wildlife protection plan, which is no impact to caribou herds from the project. As noted earlier in our presentations, this project does not interact with the Bathurst herd. Since June of 2016, Sabina worked hard to further understand the location and movement of the herd; looking at Northwest Territories Aboriginal traditional knowledge; working with the Bathurst range planning team; analyzing additional government satellite collar data; conducting baseline studies, such as aerial surveys and camera studies. The available data, including the most up to date from 2016 was not available to us last year, but this indicates -- still indicates that the project does not overlap with the seasonal ranges of the Bathurst herd.*
>
> *As such, we are very confident in that conclusion* [the conclusion that there would be no significant transboundary effects on caribou].[1303]
>
> *… Point 4, monitoring of zone of influence and behaviour. Several Northwest Territories groups, including the Government of Northwest Territories, the North Slave Metis Alliance, and the Yellowknives Dene First Nation, commented that they would like to see additional monitoring of project effects on caribou, particularly a zone-of-influence monitoring program to look at changes in caribou distribution and an associated behavioural monitoring program. In response, Sabina added considerable additional detail to the zone-of-influence monitoring, Section 7.2.2.4; the behaviour monitoring program, Section 7.2.2.2; and the stress monitoring program, Section 7.2.2.3.*[1304]
>
> *The most recent example of change that we have made is to commit to comments from the Northwest Territories intervenors …committed by Sabina yesterday was to reduce the number of caribou that would trigger the staged reduction of project activities, as well as the rapid operational shutdowns. With respect to the rapid operational shutdown, Sabina lowered the required density from approximately 4.2 caribou per square kilometre down to 2 caribou per square kilometre.*

[1302] FEIS Addendum, Volume 5, p. 5-59.

[1303] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 357-358, lines 11-26 and line 1.

[1304] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, pp. 359-360, lines 24-26 and lines 1-10.

You asked us to comment on whether…in Sabina's view, the changes we had made to the wildlife protection plan satisfactorily addressed the concerns of the Northwest Territories intervenors. We believe that it has. [1305]

6.7.2 Views and Concerns of Interested Parties

As discussed in more detail in sections 4.11: Terrestrial Wildlife and Wildlife Habitat and 6.4: Cumulative Effects the potential for impacts (including transboundary impacts) on the Bathurst caribou herd was the focus of a great deal of the review and discussion of transboundary effects for this Project at both the 2016 Final Hearing and the supplemental Final Hearing. Although, based on what is known of the current range of the Bathurst herd and as acknowledged by the Government of the Northwest Territories at the Final Hearings, the Project does not currently overlap with the Project Development Area at the Goose Property or with the Marine Laydown Area.[1306]

However, at the 2016 Final Hearing, several intervenors, Community Representatives and Board Members familiar with the area noted that significant shifts in the ranges of any of the caribou herds that have occupied the area in the past could change this situation and the potential for project-induced effects on caribou (including transboundary effects) could occur as a result.[1307] As noted above, in the FEIS Addendum and at the supplemental Final Hearing, Sabina indicated that they had significantly enhanced the mitigation, management and monitoring measures designed to prevent all effects (including direct and residual transboundary effects) on caribou.

In the final written submission of Indigenous and Northern Affairs Canada (INAC) prior to the 2016 Final Hearing, it was noted the continued involvement of transboundary groups and organizations will be important even once the environmental assessment for the Project has been completed.[1308] Within its response to those final written submissions, Sabina noted that it had committed to community engagement throughout all project phases within its Community Involvement Plan. Sabina confirmed that it would continue ongoing engagement with selected Aboriginal organizations in the Northwest Territories and residents of Yellowknife and noted that specific engagement methods would be dependent on project phase, community/location, and types of information being solicited.

6.7.3 Views of the Board

As previously acknowledged by the Board in the 2016 Final Hearing Report, the potential for residual effects on caribou resulting in transboundary impacts is currently limited, given that there is no overlap between the current range of the Bathurst herd and the Project Development Areas, but reflecting that the caribou range may shift considerably during the course of the Project lifecycle, the Board nonetheless had significant concerns about the potential for project-induced transboundary effects on caribou.

[1305] M. Pickard, Sabina Gold & Silver Corp., NIRB supplemental Final Hearing File No. 12MN036 Transcript, June 1, 2017, p. 361, lines 3-17.
[1306] A. Patenaude, Government of the Northwest Territories, NIRB 2016 Final Hearing File No. 12MN036 Transcript, April 29, 2016, p. 1236, lines 7-18.
[1307] See the discussion of this issue in Section 4.11.4.2 of this revised Final Hearing Report.
[1308] Indigenous and Northern Affairs Canada, Final Written Submission, March 7, 2016, INAC-TC#12.

In the Board's view, as expressed in the 2016 Final Hearing Report, the potential for significant shifts in caribou migration and caribou calving and post-calving grounds had the potential to greatly alter Sabina's predictions of no significant effects and created too much certainty for the Board to be confident that the potential for effects could be adequately mitigated and managed by Sabina. In arriving at this conclusion in 2016, the Board recognized any project-induced effects on an already stressed caribou population could have damaging effects not only in Nunavut but also to transboundary groups who have experienced significant adverse effects already.[1309]

In addition, as outlined in Section 6.4.3: Cumulative Effects, the Board has concluded that the potential for transboundary effects predictions to change considerably over the life of the Project requires the Board to apply a more stringent and protective approach to the application of the precautionary principle to the assessment of these effects.

As discussed in much greater detail in Section 4.11.4: Terrestrial Wildlife and Wildlife Habitat, and Section 6.4.3: Cumulative Effects, the Board finds that the substantive and significant revisions to the Wildlife Mitigation and Monitoring Program Plan (WMMPP) have addressed the uncertainty identified by the Board in the 2016 Final Hearing Report in respect of preventing, mitigating and managing the potential for transboundary effects on caribou and was a significant factor in the Board being unable to recommend that the Project be allowed to proceed.

In particular, the Board finds that the following measures increase the Board's confidence that Sabina can now successfully mitigate the potential for significant adverse transboundary effects on caribou:

- inclusion of defined thresholds that trigger concrete and well-defined management measures when caribou overlap the Project Development Area, including management measures that could involve operational shutdowns;
- enhancing on-site caribou monitoring measures rather than solely relying on collar data;
- the establishment of an Inuit Environmental Advisory Committee to ensure that Inuit perspectives and Inuit Qaujimaningit continue to inform the implementation and adaptation of the WMMPP as necessary; and
- the establishment of a Caribou Technical Advisory Group to provide objective and on-going assessment of the effectiveness and adaptability of the WMMPP informed by up to date technical data.

6.7.4 Conclusions and Recommendations of the Board

As outlined in greater detail in Section 4.11.4: Terrestrial Wildlife and Wildlife Habitat, reflecting the significant revisions to the Wildlife Mitigation and Monitoring Program Plan undertaken by Sabina in consultation with the Intervenors and affected communities following the 2016 Final Hearing and reflecting a highly protective and precautionary approach to the management of potential effects on caribou, the Board is now confident that the implementation monitoring, mitigation, and adaptive management measures will be sufficient to prevent and limit the potential for transboundary effects.

[1309] Łutsel K'e Dene First Nations, Final Written Submissions, March 7, 2016, pp. 6-7.

7 RECOMMENDATION TO THE MINISTER

The NIRB provides this revised Report as required under Article 12, Sections 12.5.6 and 12.5.7 of the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada* (*Nunavut Agreement*). Following the NIRB's assessment of the potential ecosystemic and socio-economic effects of the Sabina Gold & Silver Corp.'s Back River Gold Mine Project proposal, NIRB File No. 12MN036 (the Back River Gold Project) from 2012-2016 and following the Board's further assessment in 2017 in respect of five (5) areas of deficiency identified in the Minister's January 12, 2017 referral of the NIRB's 2016 Final Hearing Report back to the Board, the Board's duly appointed Back River Gold Project Panel (P5) has determined that:

> After due consideration of all information provided throughout the Board's assessment of Sabina Gold & Silver Corp.'s Back River Gold Mine Project proposal, NIRB File No. 12MN036 and in accordance with the process and primary objectives of the *Nunavut Agreement*, the Panel has recommended that the Project should be allowed to proceed in accordance with this revised Final Hearing Report and the 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 *Nunavut Agreement*, the NIRB has the jurisdiction to establish a project-specific monitoring program to: measure the ecosystemic and socio-economic 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 *Nunavut Agreement* 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. 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, and 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 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. 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 *Nunavut Agreement* to revisit the monitoring program, or any other terms and conditions in the NIRB Project Certificate. However, the NIRB wishes to clearly state that the Board has every expectation that Sabina Gold & Silver Corp. will fulfill all commitments made during the both the Final Hearing and supplemental Final Hearing, within its Final Environmental Impact Statement (FEIS), FEIS Addendum and supporting documentation submitted during the Review, not just those commitments that have been incorporated into the Terms and Conditions recommended by the Board in this report.

8.2 FORMAT OF RECOMMENDATIONS

8.2.1 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.

8.3 ECOSYSTEMIC TERMS AND CONDITIONS

8.3.1 Air Quality

Term and Condition No.	**1.**
Category:	Air Quality – Air Quality Monitoring and Management Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To provide parties with updated information on air quality baseline information and monitoring conducted on-site.
Term or Condition:	The Proponent shall have in place an Air Quality Monitoring and Management Plan, which shall include the following: a. Description of air monitoring stations including proposed timing of installation, location, and any factors considered with regards to planning for the installation; b. Plans for the collection of total suspended dust samples year round, including sampling for metals content relevant to the Project; c. Description of dustfall collectors;

	d. Description of lichen surveys; e. Identification of near field, far field and reference sites locations with demonstrated consideration for ambient wind conditions; f. Baseline data collected prior to significant construction activity; and g. A description of the proposed annual reporting mechanism and response framework.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

Term and Condition No.	**2.**
Category:	Air Quality – Air Quality Mitigation and Adaptive Management
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that mitigation and adaptive management measures effectively mitigate impacts on-site.
Term or Condition:	The Proponent shall demonstrate through monitoring of air quality that all emissions remain within predicted levels and, where applicable, within limits established by all applicable guidelines and regulations. In cases where exceedances occur, 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 determined following approval of the Project by the Minister.

Term and Condition No.	**3.**
Category:	Air Quality – Air Quality Monitoring and Management Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that mitigation and adaptive management measures effectively mitigate dust impacts on-site.
Term or Condition:	The Proponent shall have in place dust management and monitoring plans which address the following items: a. Reflect commitments made in the Final Environmental Impact Statement, the Final Environmental Impact Statement Addendum, and through the Nunavut Impact Review Board's impact assessment process; b. Verify commitments to use dust suppressants on-site, including a description of the type of suppressant to be used, as well as the frequency and timing of applications to be made throughout the

	periods of applicable use; c. Specify commitments to the use of appropriate dust suppression measures when conducting activities in the landfill such as topping or capping; d. Outline the specific adaptive management measures to be considered should monitoring indicate that dust deposition is higher than predicted, specifically where project-related traffic is greater than initially expected or where meteorological events have instigated additional deposition; and e. Demonstrate consideration for the implementation of alternative methods (e.g., windscreens) to limit the deposition of dust generated from the Project.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to commencement of construction activities. Further reporting to be determined following approval of the Project by the Minister.

Term and Condition No.	**4.**
Category:	Air Quality – Incineration Management Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that waste management operations are conducted in line with regulatory guidelines.
Term or Condition:	The Proponent shall develop and implement an Incineration Management Plan that demonstrates consideration for the recommendations provided in Environment and Climate Change Canada's Technical Document for Batch Waste Incineration (2010).[1310]
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**5.**
Category:	Air Quality – Stack Monitoring
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To monitor waste management operations.
Term or Condition:	The Proponent shall provide the results of all stack testing conducted on temporary or permanent incinerators operated for the Project for the year in which testing was conducted.
Reporting Requirements:	Results to be reported to the Nunavut Impact Review Board and to Environment and Climate Change Canada annually, or as may otherwise be required.

[1310] Environment Canada, 2010. Technical Document for Batch Waste Incineration.

8.3.2 Climate and Meteorology

Term and Condition No.	**6.**
Category:	Climate and Meteorology – Greenhouse Gas Reduction Plan
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, and Closure
Objective:	To monitor and reduce greenhouse gas emissions produced by the Project.
Term or Condition:	The Proponent shall maintain a Greenhouse Gas Emissions (GHG) Reduction Plan which includes: a. An estimate of the Project's GHG baseline emissions; b. A description of monitoring measures to be undertaken, including the methods, frequency, parameters, and a description of data analysis; and c. A description of mitigative and adaptive strategies planned, and taken, toward reducing the project-related emission of greenhouse gases over the Project's life.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to commencement of construction activies, with results submitted annually thereafter or as may otherwise be required by the NIRB.

Term and Condition No.	**7.**
Category:	Climate and Meteorology – Mine Closure and Reclamation Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure mitigation, monitoring, and adaptive management measures are in place for the long-term stability, containment, and integrity of project components and the protection of environmental features.
Term or Condition:	The Proponent shall maintain a Mine Closure and Reclamation Plan designed to: identify the processes that may act upon the mine components after closure and reclamation so that they can be factored within the design and operation of the mine; ensure physical and chemical stability of mine components that remain after closure; ensure mine components that remain after closure will not require long-term active care; and consider future use and aesthetics of the area with the surrounding lands. This plan should include: a. An adaptive management component that documents monitoring and mitigation measures to ensure long-term containment of the Tailings Storage Facility and Waste Rock Storage Areas; b. Details for monitoring the thermal condition and stability of storage facilities; c. Details on the triggers for implementing alternative mitigation options;

	d. Details pertaining to ongoing monitoring and research being conducted to supplement the adaptive management protocols; e. Details on the plans to maintain the integrity of the groundwater quality within and adjacent to the Project; and f. Details on how the Proponent will carry out continued analyses over time to confirm or update the approximate fill time for the mine pits.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

Term and Condition No.	**8.**
Category:	Climate and Meteorology – Weather Monitoring and Adaptive Management
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To monitor local weather and adaptively manage potential impacts from extreme or abnormal weather conditions.
Term or Condition:	The Proponent shall provide a summary report of meteorological conditions experienced within the project area including details related to temperature, wind velocities and patterns, precipitation, as well the onset of seasonal freeze and thaw cycles, and highlight extreme or outlying weather events.
Reporting Requirements:	Results to be included in the Proponent's annual report to the Nunavut Impact Review Board.

8.3.3 Noise and Vibration

Term and Condition No.	**9.**
Category:	Noise and Vibration – Noise Reduction
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, and Final Closure
Objective:	To ensure worker health and safety.
Term or Condition:	The Proponent shall demonstrate consideration for noise reduction measures when siting and constructing both the Goose Property and Marine Laydown Area camps. Further, the Proponent shall demonstrate that noise levels will remain within reasonable limits and no further mitigation (e.g. additional sound proofing) is required.
Reporting Requirements:	To be determined following approval of the Project by the Minister

Term and Condition No.	**10.**
Category:	Noise and Vibration – Noise Reduction
Responsible Parties:	The Proponent
Project Phase:	Construction and Operation
Objective:	To ensure worker health and safety.
Term or Condition:	The Proponent shall demonstrate its consideration of options to further mitigate noise generated from project activities, equipment, and components during normal operations as well as from project activities, equipment, and components that would remain operational during staged reduction events (e.g., noise barriers, acoustic insulation, exhaust silencers).
Reporting Requirements:	To be determined following approval of the Project by the Minister

8.3.4 Terrestrial Environment

Term and Condition No.	**11.**
Category:	Terrestrial Environment – Permafrost Mapping and Monitoring
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To monitor and plan for changing permafrost conditions.
Term or Condition:	The Proponent shall conduct further permafrost mapping to document permafrost temperature, thickness of seasonal thaw and amount of ground ice in the project development area. This information will be made available to inform the detailed design of project infrastructure.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**12.**
Category:	Terrestrial Environment – Permafrost Monitoring
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To monitor and mitigate impacts from the Project on permafrost.
Term or Condition:	The Proponent shall monitor the effects of the Project on permafrost conditions relative to project infrastructure, including associated roads, waste rock stockpiles, trails, and quarries. Should permafrost degradation be observed, the Proponent shall report on measures implemented to restore and promote permafrost integrity.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**13.**
Category:	Terrestrial Environment – Sensitive Landform Mitigation and Monitoring
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate project impacts on sensitive landforms.
Term or Condition:	The Proponent shall undertake additional geotechnical investigations as required to identify sensitive landforms, modify engineering design for project infrastructure (e.g., tailings storage facilities, waste rock piles, and landfill), and develop and implement mitigation and monitoring measures to prevent or minimize the impacts of the Project's activities and infrastructure on sensitive landforms. Plans for the investigations, mitigation, and monitoring measures are to be included within appropriate management plans.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**14.**
Category:	Terrestrial Environment – Waste Management Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure waste management is protective of the surrounding environment.
Term or Condition:	The Proponent shall provide a Waste Management Plan that describes how the local environment, including permafrost integrity and water quality, will not be harmed by wastes at project landfills. The Proponent shall demonstrate that the use of liners at waste management facilities has been considered and adopted, wherever feasible.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board at least 90 days prior to the start of construction, with updates provided as necessary.

Term and Condition No.	**15.**
Category:	Terrestrial Environment – Progressive Reclamation Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that project components, areas, and infrastructure are progressively reclaimed throughout the life of the Project.
Term or Condition:	The Proponent shall have in place a plan for the progressive reclamation of project components, areas, and infrastructure throughout the life of the Project. The plan shall detail: a. projected timelines for the reclamation of project features,

	methodologies for undertaking such activities, and monitoring measures to ensure the effectiveness of reclamation methods employed; b. specific measures for adaptive management and triggers for their application, should monitoring results reveal trends that could affect the reclamation and closure objectives.; and, c. how Inuit Qaujimajatuqangit and Traditional Knowledge was collected, and used to inform closure plans and the design of project components.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results and details submitted annually thereafter or as may otherwise be required by the NIRB.

8.3.5 Geological Features, Surficial and Bedrock Geology, and Geochemistry

Term and Condition No.	**16.**
Category:	Geological Features, Surficial and Bedrock Geology and Geochemistry – Aggregate Sources
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, and Closure
Objective:	To inform parties on the quarry or borrow materials required for the development of project infrastructure.
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:	The plan should be submitted to the Nunavut Impact Review Board and the Kitikmeot Inuit Association at least 60 days prior to the use of borrow or quarry sites for review and approval. Annual reporting requirements to be determined following approval of the Project by the Minister.

Term and Condition No.	**17.**
Category:	Geological Features, Surficial and Bedrock Geology and Geochemistry – Monitoring of Tailings and Treatment Sludges
Responsible Parties:	The Proponent
Project Phase:	Operations, Temporary Closure/Care and Maintenance
Objective:	To mitigate potential impacts to the receiving environment caused by remobilization of arsenic.
Term or Condition:	The Proponent shall conduct tests of the tailings and treatment sludges as they are produced to evaluate the potential for remobilization of arsenic from these materials.
Reporting Requirements:	The results of the tests should to be submitted the Nunavut Impact Review Board (NIRB), the Kitikmeot Inuit Association and other interested parties annually or as may otherwise be required by the NIRB.

Term and Condition No.	**18.**
Category:	Hydrogeology and Groundwater Quantity and Quality – Geotechnical Characterization Program
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations
Objective:	To minimize the impacts of contaminated water to the groundwater and receiving environment.
Term or Condition:	The Proponent shall undertake an infill geotechnical characterization program to determine the extent of the fractured bedrock contact zone and apply proposed mitigation measures as necessary. The program should include permeability testing, seepage analysis and planning for thermal monitoring of the western ridge, where appropriate.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

8.3.6 Hydrological Features and Hydrogeology

Term and Condition No.	**19.**
Category:	Hydrological Features and Hydrogeology
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To manage saline groundwater and minimize the impacts to permafrost, soil, surface water, vegetation and wildlife.
Term or Condition:	The Proponent shall, reflecting any direction from the Nunavut Water Board, maintain a saline water management plan which includes monitoring of thermal conditions, monitoring of saline water at the Goose site, and mitigation measures designed to address the potential for higher-than-predicted volumes of saline water inflows into the open pits and the underground mine, treatment and disposal methods. The plan should include accurate characterization of saline water inflows into the underground mine workings.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 60 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

Term and Condition No.	**20.**
Category:	Hydrological Features and Hydrogeology
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To minimize the impacts of contaminated water to the groundwater and receiving environment.

Term or Condition:	The Proponent shall develop a thermal monitoring plan to address the potential changes in permafrost/talik distribution, flow distribution and flow paths that may be directly or indirectly affected by the Project facilities and activities. Thermal monitoring should be considered at a minimum for the critical cross sections of the Main Dam, Llama Pit, and Umwelt Pit.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

8.3.7 Groundwater and Surface Water Quality

Term and Condition No.	**21.**
Category:	Groundwater and Surface Water Quality, Sediment Quality and Freshwater Aquatic Environment – Aquatic Effects Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate potential impacts to groundwater and surface waters.
Term or Condition:	The Proponent shall, reflecting any direction from the Nunavut Water Board, maintain an Aquatic Effects Monitoring Plan (AEMP) designed to: ▪ determine the short and long-term effects in the aquatic environment resulting from the Project; ▪ evaluate the accuracy of Project effect predictions; ▪ assess the effectiveness of mitigation and management measures on Project effects; ▪ identify additional mitigation measures to avert or reduce environmental effects due to Project activities; and ▪ comply with Metal Mining Effluent Regulations requirements, should an Environmental Effects Monitoring program be triggered. The AEMP should include sufficient sampling and monitoring programs to appropriately characterize the receiving environment to ensure that adequate data is available to assess impact predictions made within the Final Environmental Impact Statement.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

Term and Condition No.	**22.**
Category:	Groundwater and Surface Water Quality; and Hydrological Features and Hydrogeology – Site Water Monitoring and Management Pan
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance and Closure and Post-Closure Monitoring

Objective:	To minimize the use of natural waters as practicable and limit potential impacts to the receiving environment from contact (site) water.
Term or Condition:	The Proponent shall, reflecting any direction from the Nunavut Water Board, maintain a Site Water Monitoring and Management Plan designed to: minimize the amount of water that contacts mine ore and wastes; appropriately manage all contact water and discharges to protect local aquatic resources; and, implement water conservation and recycling to maximize water reuse and minimize the use of natural waters. The plan should include monitoring that demonstrates contact water (runoff and shallow groundwater) from the ore storage and waste rock storage areas is adequately captured and managed, as per the Mine Waste Rock Management Plan.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

8.3.8 Freshwater Aquatic Environment

Term and Condition No.	**23.**
Category:	Freshwater Aquatic Environment – Setbacks
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance and Closure
Objective:	To mitigate impacts of runoff/sedimentation into freshwater aquatic habitat.
Term or Condition:	The Proponent shall maintain an appropriate setback distance between project quarries and fish-bearing or permanent waterbodies, or implement appropriate mitigation measures, as required to prevent acid rock drainage or metal leaching into such waterbodies.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**24.**
Category:	Freshwater Aquatic Environment – Watercourses
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent blockages or restrictions to fish passages.
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, unless otherwise authorized by Fisheries and Oceans Canada.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**25.**
Category:	Freshwater Aquatic Environment – Blasting
Responsible Parties:	The Proponent, Fisheries and Oceans Canada
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance and Closure.
Objective:	To mitigate impacts of explosives use on fish and fish habitat.
Term or Condition:	The Proponent shall engage with Fisheries and Oceans Canada in exploring possible project specific thresholds, mitigation and monitoring 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 determined following approval of the Project by the Minister

Term and Condition No.	**26.**
Category:	Freshwater Aquatic Environment – Fish Passage
Responsible Parties:	The Proponent, the Kitikmeot Inuit Association, Fisheries and Oceans Canda
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To minimize potential impacts to the migration of Arctic Grayling.
Term or Condition:	The Proponent shall engage Fisheries and Oceans Canada, the Kitikmeot Inuit Association, and other interested parties during the regulatory phase on the design, construction, and operation of adequate fish passage to permit migration of Arctic Grayling from Goose Lake to natural spawning and rearing habitat located in upper Rascal Stream East, south of the planned airstrip. Any additional information required to ensure the design of the fish passage will be completed prior to significant construction activities at the Goose Property.
Reporting Requirements:	The updated information should be submitted to the Nunavut Impact Review Board (NIRB) at least 60 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

Term and Condition No.	**27.**
Category:	Freshwater Aquatic Environment – Water Withdrawal Sites
Responsible Parties:	The Proponent, Nunavut Water Board, Fisheries and Oceans Canada
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To minimize impacts to freshwater fish habitat that may be used for water withdrawal.
Term or Condition:	The Proponent shall provide bathymetry, depth, and location of proposed water withdrawal sites, volumes to be extracted, anticipated water level decreases, and fish habitat features within each waterbody proposed to be

	used for winter water withdrawal in support of the annual construction of the winter ice roads. If additional waterbodies are required the Proponent shall provide all required information on the additional proposed lakes prior to the use of the waterbodies.
Reporting Requirements:	The information for each waterbody should be provided to the Nunavut Impact Review Board (NIRB), Fisheries and Oceans Canada (DFO), and the Nunavut Water Board (NWB) during the regulatory phase. Information on additional waterbodies should be provided to the NIRB, the DFO, the NWB, and other interested parties at least 90 days prior to the start of water withdrawal or as otherwise directed by DFO or the NWB.

Term and Condition No.	**28.**
Category:	Freshwater Aquatic Environment – Winter Ice Road
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to fish and fish habitat.
Term or Condition:	The Proponent shall implement all applicable Fisheries and Oceans Canada best management practices to avoid and mitigate serious harm to fish as a result of the construction, operation, and decommissioning of winter ice roads, and from under ice water withdrawals. This includes adequately screening the water intakes pipes to prevent impingement and entrainment of fish.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**29.**
Category:	Freshwater Aquatic Environment – Water Crossings
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To mitigate impacts to fish and fish habitat.
Term or Condition:	The Proponent shall implement all applicable Fisheries and Oceans Canada best management practices to avoid and mitigate serious harm to fish as a result of water crossing construction, operation, and decommissioning for all fish-bearing water crossings. These measures should include, but are not limited to, appropriate design of water crossings to facilitate fish passage at both high and low flows, timing windows that incorporate spawning, incubation and hatch times for all species using watercourses, sediment and erosion control, protection of riparian vegetation, and other forms of bank stabilization.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**30.**
Category:	Freshwater Aquatic Environment – Monitoring Program for Culverts
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To minimize the impacts to fish bearing watercourses.
Term or Condition:	Unless otherwise directed by Fisheries and Oceans Canada, the Proponent's monitoring program for culverts on fish bearing watercourses during the operations and closure phases shall include measures to ensure that barriers to fish passage do not form over time as a result of crossing damage due to ice blockage, flooding, or movement of debris; all of which may occur at freshet. Detailed design drawings and an updated monitoring program shall be produced prior to construction.
Reporting Requirements:	The updated drawings and monitoring program should be submitted to the Nunavut Impact Review Board (NIRB) and Fisheries and Oceans Canada (DFO) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB and DFO.

Term and Condition No.	**31.**
Category:	Freshwater Aquatic Environment – Monitoring Program for Culverts
Responsible Parties:	The Proponent
Project Phase:	Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To minimize the impacts to fish and fish habitat.
Term or Condition:	The Proponent should provide annual monitoring updates regarding the Rascal Stream Fish Passage that enables parties to determine its effectiveness.
Reporting Requirements:	The monitoring updates should be submitted annually to the Nunavut Impact Review Board (NIRB) and Fisheries and Oceans Canada (DF0).

8.3.9 Vegetation

Term and Condition No.	**32.**
Category:	Vegetation – Site Footprint
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To minimize the impacts of the Project on 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 determined following approval of the Project by the Minister.

Term and Condition No.	**33.**
Category:	Vegetation – Invasive Species
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To prevent the 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. The Proponent shall also incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into relevant monitoring and management plans for the terrestrial environment. Any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**34.**
Category:	Vegetation – Vegetation Monitoring Plan
Responsible Parties:	The Proponent, the Kitikmeot Inuit Association, the Government of Nunavut
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To minimize potential impacts to vegetation along the winter road/trail routings and around project sites.
Term or Condition:	The Proponent shall have in place a Vegetation Monitoring Plan that is designed to quantify the potential impacts on vegetation from the Project, including the annual construction/operation of the winter ice roads and trails. The plan should include all commitments discussed throughout the Review of the Project, including commitments to consult with the Kitikmeot Inuit Association, the Government of Nunavut, and other relevant parties, as well as: a. Establishment of pre-construction and post-operation vegetation conditions annually with supporting photographs to allow for long-term comparisons of vegetation conditions along winter ice road/trail routings and around project sites; b. Incorporation of measures to prevent or minimize potential destabilization and erosion along winter ice road/trail routings and around project sites; c. Details on the triggers for implementing adaptive management options if effects to vegetation are observed, including potential impacts from dust deposition; and, d. Discussion of how the findings from monitoring efforts would be

	used to inform reclamation planning.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

Term and Condition No.	**35.**
Category:	Vegetation – Revegetation and Reclamation
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To maximize revegetation in reclaimed areas.
Term or Condition:	The Proponent shall develop a progressive revegetation program for disturbed areas that are no longer required for operations, such as a 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:	The program and associated revegetation results should be provided wtihin the Proponent's annual report submitted to the Nunavut Impact Review Board.

Term and Condition No.	**36.**
Category:	Vegetation – Mine Closure and Reclamation Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To maintain an up to date revegetation plan for the Project.
Term or Condition:	The Proponent shall include revegetation strategies within its Mine Closure and Reclamation Plan that support progressive reclamation, and promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment. These strategies should include exploration of the feasibility and practicality of topsoil/organic matter salvage through Project development. The Closure and Reclamation Plan should be updated on an on-going basis as more information becomes available from similar reclamation efforts at other northern projects, as applicable.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

8.3.10 Terrestrial Wildlife and Wildlife Habitat

Term and Condition No.	**37.**
Category:	Wildlife and Wildlife Habitat – Wildlife Mitigation and Monitoring Plan
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate, monitor, and adaptively manage potential impacts to wildlife.
Term or Condition:	The Proponent shall have in place a Wildlife Mitigation and Monitoring Program Plan (WMMPP) throughout all phases of the Project. The plan shall include detailed monitoring, mitigation, and adaptive management measures for wildlife, and shall detail considerations for: species-specific sensitive wildlife periods and areas; activities known to affect wildlife; specific triggers for mitigation and adaptive management intervention; and implementation of all commitments made throughout the Nunavut Impact Review Board's (NIRB) assessment of the Project. The Proponent shall demonstrate appropriate refinements to the WMMPP's design throughout the life of the Project, as necessary to allow for the identification of long-term trends and cumulative effects where project interactions with wildlife are identified. Updates to the WMMPP may be triggered by significant changes in project development plans, monitoring results indicating biologically-meaningful changes, significant updates to the scientific understanding of management methods relevant to wildlife at the project site, Inuit Qaujimajatuqangit, Traditional Knowledge, changes in climatic conditions that might subject wildlife to unexpected impacts, or as otherwise necessary.
Reporting Requirements:	The plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with revised versions submitted annually thereafter or as may otherwise be required by the NIRB.

Comments: Measures included in the WMMPP shall be inclusive of all commitments made by the Proponent throughout the Review of the Project. Further, the Proponent shall, throughout the duration of the Project, collaborate with the Kitikmeot Inuit Association, the Government of Nunavut, and other relevant parties to develop updated mitigation, monitoring, and adaptive management measures within the Wildlife Mitigation and Monitoring Program Plan.

Term and Condition No.	**38.**
Category:	Wildlife and Wildlife Habitat – Wildlife Monitoring
Responsible Parties:	The Proponent, the Kitikmeot Inuit Association, the Government of Nunavut
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To monitor wildlife in collaboration with other monitoring bodies.
Term or Condition:	In consultation with the Government of Nunavut, the Kitikmeot Inuit Association, and other relevant parties, the Proponent shall make efforts to contribute to existing and planned cumulative effects and regional monitoring programs for caribou, grizzly bear, wolverine and muskox, as

	appropriate. Relevant details of coordination through data sharing arrangements or agreements should be highlighted.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**39.**
Category:	Wildlife and Wildlife Habitat – Caribou Mitigation and Adaptive Management Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to caribou throughout the life of the Project.
Term or Condition:	The Proponent shall provide, within its Wildlife Mitigation and Monitoring Program Plan (WMMPP), measures for the staged reduction of project activities should caribou occur in proximity to the project site. The WMMPP will include a detailed description of all project activities, equipment, and components that would be managed during different phases of staged reduction mitigation events, including rapid and planned operational shutdowns should caribou calving or post-calving ranges overlap with the Project. Any planned activity restrictions/cessations should be of sufficient duration to take into account annual variation in the timing and distribution of calving and post-calving caribou interactions with the Project.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Comments: Additional details to be contained within the WMMPP shall include a quantitative description of the noise produced by all activities, equipment, and components that would be managed during the staged reduction events, in addition to an analysis of the zones over which continuous and instantaneous noise thresholds for caribou would be exceeded within the project area. The Proponent shall provide updated details throughout the life of the Project should activities, equipment, or components alter the zones of influence as originally assessed.

Term and Condition No.	**40.**
Category:	Wildlife and Wildlife Habitat – Caribou Monitoring
Responsible Parties:	The Proponent, the Kitikmeot Inuit Association, the Government of Nunavut
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that implementation of adaptive management is not unduly delayed by potential lag times associated with delayed access to collar data.
Term or Condition:	In consultation with the Kitikmeot Inuit Association, the Government of Nunavut, and relevant parties, the Proponent shall ensure that the utilization of satellite collar data as an early detection method for caribou takes into consideration an agreed-upon biological buffer, as well as potential lag times associated with delayed access to collar data, for the development of thresholds for monitoring and adaptive management triggers.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**41.**
Category:	Wildlife and Wildlife Habitat – Caribou Mitigation Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to caribou during periods of heightened sensitivity.
Term or Condition:	The Proponent shall demonstrate consideration for the increased potential of caribou presence in the area when planning outdoor construction activities (including site clearing, blasting, and operation of heavy equipment) during the July 26 to August 31 period.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**42.**
Category:	Wildlife and Wildlife Habitat – Caribou Mitigation Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that mitigation measures apply for all caribou.
Term or Condition:	The Proponent shall ensure that all caribou mitigation and monitoring measures (including mitigation for shifts in calving and post-calving ranges) included within the Wildlife Mitigation Monitoring Program Plan apply to all caribou, regardless of the herd.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**43.**
Category:	Wildlife and Wildlife Habitat – Wildlife Mitigation Measures
Responsible Parties:	The Proponent, the Government of Nunavut
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that specific criteria and procedures are developed should wildlife be deemed project-tolerant.
Term or Condition:	In consultation with the Government of Nunavut (GN) and other relevant authorities, the Proponent shall include criteria and procedures within its Wildlife Mitigation and Monitoring Program Plan governing the deterring of wildlife from blast zones and the relaxation of mitigation measures for animals deemed project-tolerant. Caribou shall be deterred using only agreed-upon deterrence measures established in consultation with the GN and only if their safety is deemed at risk.
Reporting Requirements:	The information should be submitted to the Nunavut Impact Review Board

	(NIRB) at least 90 days prior to the start of construction, further reporting to be determined following approval of the Project by the Minister.

Term and Condition No.	**44.**
Category:	Wildlife and Wildlife Habitat – Muskox Mitigation Measures
Responsible Parties:	The Proponent, the Government of Nunavut
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to muskox from project activities.
Term or Condition:	In collaboration with the Government of Nunavut, the Proponent shall specify within its Wildlife Mitigation and Monitoring Plan specific mitigation measures, trigger distances, and group size thresholds for the protection of muskox in proximity to project activities (e.g., blasting, heavy truck traffic, and aircraft).
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**45.**
Category:	Wildlife and Wildlife Habitat – Wildlife Mitigation Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential disturbances to wildlife migration and movement from project infrastructure.
Term or Condition:	The Proponent shall ensure that safety barriers, berms, and designed crossings associated with project infrastructure, including site roads and the winter ice road, are constructed as necessary to allow for the safe passage of caribou and other terrestrial wildlife and do not interfere with wildlife denning sites.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**46.**
Category:	Wildlife and Wildlife Habitat – Wildlife Monitoring and Adaptive Management Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that all direct mortalities are reported and considered in the development of adaptive management protocols.
Term or Condition:	The Proponent shall file an incident report to the local wildlife conservation office for any and all direct wildlife mortalities that occur in association with the Project. All incident reports should include sufficient detail to

	demonstrate how monitoring and mitigation measures failed to prevent the mortality, as well as information pertaining to what measures would be put in place to prevent the incident from reoccurring. The Proponent shall reach an agreement with the appropriate Designated Inuit Organization regarding compensation for any direct mortality of wildlife resulting from the Project.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**47.**
Category:	Wildlife and Wildlife Habitat – Wildlife Mitigation and Monitoring Measures
Responsible Parties:	The Proponent, the Kitikmeot Inuit Association
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to wildlife through interaction with water attenuation ponds and/or tailings storage areas.
Term or Condition:	The Proponent shall, in consultation with the Kitikmeot Inuit Association, develop and implement measures to prevent the use of water attenuation ponds and tailings storage areas by wildlife, including waterfowl, other migratory birds, and caribou, with sufficient monitoring to assess whether these measures are effective or whether further deterrents may be required.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**48.**
Category:	Wildlife and Wildlife Habitat – Wildlife Mitigation Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to wildlife from attraction to project infrastructure.
Term or Condition:	The Proponent shall develop and implement mitigation measures and monitoring programs to limit the attraction of predators and scavengers to Project facilities, and to limit impacts from specific project activities.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**49.**
Category:	Wildlife and Wildlife Habitat – Annual Reporting to the Nunavut Impact Review Board
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure

Objective:	To provide annual updates to the Nunavut Impact Review Board and relevant parties for ongoing monitoring and collaboration purposes.
Term or Condition:	The Proponent shall report to the Nunavut Impact Review Board (NIRB) regarding its terrestrial wildlife monitoring efforts, with inclusion of the following information: a. Description of all updates to terrestrial wildlife baseline data; b. A description of the involvement of local communities in its monitoring programs; c. A detailed presentation and analysis of the distribution relative to Project infrastructure and activities for caribou and other terrestrial mammals observed during surveys and incidental sightings; and d. Results of the annual monitoring programs, including methodologies and statistical approaches used to support conclusions drawn.
Reporting Requirements:	Information should be provided within the Proponent's annual report submitted to the NIRB.

Term and Condition No.	**50.**
Category:	Wildlife and Wildlife Habitat – Annual Reporting to the Nunavut Impact Review Board
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To provide annual updates to the Nunavut Impact Review Board and relevant parties to verify the effectiveness of ongoing monitoring and mitigation efforts.
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 wildlife behaviour, mortalities, and displacements (if any), and responses to project operations; c. A detailed description of staged reduction mitigation events, including operational shutdowns, undertaken throughout the year in response to wildlife in proximity to the Project. Details shall include, but are not limited to: i. A description of the aggregation and species of wildlife encountered; ii. Environmental conditions; iii. A description of the sequence of activities ceased as well as the duration of cessation; and iv. The effectiveness of the applied mitigation measures and potential amendments that may be required.

	d. A demonstration and description of how the monitoring results contribute to cumulative effects monitoring associated with the Project; and e. Any proposed changes to the monitoring survey methodologies, statistical approaches, or proposed adaptive management stemming from the results of the monitoring program.
Reporting Requirements:	Information should be provided within the Proponent's annual report submitted to the NIRB.

Term and Condition No.	**51.**
Category:	Wildlife and Wildlife Habitat – Caribou Technical Advisory Group
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To establish an advisory group to provide technical oversight on the Project's mitigation, monitoring, and adaptive management measures related to caribou.
Term or Condition:	In collaboration with the Kitikmeot Inuit Association, the Government of Nunavut, and other relevant parties, the Proponent shall develop and participate in a Caribou Technical Advisory Group. As part of its function, the group shall seek to: ▪ Provide independent advice on study design(s) and analyses for the testing and evaluation of the Project's adaptive management measures for reducing disturbance to caribou: ▪ Undertake appropriate testing of the caribou detection methods, group size thresholds, and distance thresholds employed as recommended by the advisory group; ▪ On the basis of these tests, and any other available evidence, provide analyses and a written evaluation of the caribou protection measures and where appropriate make necessary adjustments to those measures; and ▪ Submit reports to the Nunavut Impact Review Board (NIRB), and other relevant parties, for review.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Comments: Where possible the Proponent shall include relevant hunters and trappers associations and/or knowledgeable land users in the membership of the group and shall demonstrate its consideration for community input and Inuit Qaujimajatuqangit as part of the group's function.

Term and Condition No.	**52.**
Category:	Wildlife and Wildlife Habitat – Caribou Mitigation
Responsible Parties:	The Proponent, the Kitikmeot Inuit Association, the Government of Nunavut, the Government of the Northwest Territories

Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure caribou protection in the context of additional exploration
Term or Condition:	The Proponent shall, in collaboration with the Government of Nunavut, the Government of the Northwest Territories, the Kitikmeot Inuit Association and other relevant parties, thoroughly evaluate the potential impacts to caribou from planned mineral exploration within its mineral tenures and outside the approved project development area. The Proponent must demonstrate that the potential for adverse effects to caribou populations can be prevented prior to exploration occurring.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

8.3.11 Birds and Bird Habitat

Term and Condition No.	**53.**
Category:	Birds and Bird Habitat – Mitigation, Monitoring, and Adaptive Management for Birds and Bird Habitat
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To develop and implement appropriate mitigation and monitoring measures for birds and bird habitat.
Term or Condition:	The Proponent shall have in place specific measures for the protection and monitoring of birds and bird habitat within its Wildlife Mitigation and Monitoring Program Plan (WMMPP). Protection measures shall include, but are not limited to: ▪ Mitigation and monitoring measures applied at all times throughout project operations to limit impacts to birds and bird habitat from specific project activities and infrastructure; ▪ Mitigation and monitoring measures applied during periods of heightened sensitivity or alternative circumstances; ▪ Adaptive management measures with specific triggers for intervention; and ▪ Protocols for collaboration with relevant parties, and the Project's advisory groups, throughout the Project, including on-going consideration and incorporation of Inuit Qaujimaningit, to ensure the effective delivery of the WMMPP as related to bird and bird habitat protection.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**54.**
Category:	Birds and Bird Habitat – Mitigation Measures for Birds and Species at Risk
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and

	Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to Species at Risk.
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 for nest of birds, particularly for Species At Risk, based on species-specific nest setback distances outlined in the Wildlife Mitigation and Monitoring Program Plan.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**55.**
Category:	Birds and Bird Habitat – Mitigation and Monitoring Measures for Species at Risk
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate and monitor potential impacts to Species at Risk.
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 through the duration of the Project.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**56.**
Category:	Birds and Bird Habitat – Bird Mitigation Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to birds from construction and clearing activities.
Term or Condition:	The Proponent shall, to the extent possible, schedule required ground-disturbance activities (e.g. clearing) to occur prior to the seasonal return of migratory birds to the project area and shall install nesting deterrents (e.g. flagging) to discourage birds from nesting in areas likely to be disturbed by construction/clearing activities. If clearing is to occur during the nesting season, a nest survey should take place to identify nests and establish appropriate setbacks to ensure nests remain undisturbed until the young have fledged or left the nest. Pre-clearing nest surveys should be conducted less than 14 days prior to land clearing activities as a consideration for the short nesting cycles of some arctic-nesting birds.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**57.**
Category:	Birds and Bird Habitat – Raptor Mitigation Measures
Responsible Parties:	The Proponent, the Government of Nunavut – Department of Environment
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to raptors from project operations.
Term or Condition:	Prior to removal or deterrence of raptors, the Proponent will contact the Government of Nunavut – Department of Environment to discuss proposed mitigation options and, if required, will obtain the required permits prior to undertaking any activity that can lead to the destruction of raptor nests or the deterring of raptors from nesting sites.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**58.**
Category:	Birds and Bird Habitat – Seaducks and Waterfowl Mitigation Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to seaducks and waterfowl from shipping activities.
Term or Condition:	The Proponent shall include measures within the Wildlife Mitigation and Monitoring Program Plan to ensure that, subject only to vessel safety requirements, a setback distance of at least 500 metres is maintained from colonies and moulting aggregations of seaducks and waterfowl during Project shipping transiting through Bathurst/Elu Inlet, Lambert Channel, and Eastern Lancaster Sound.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**59.**
Category:	Birds and Bird Habitat – Bird Mortality Reporting
Responsible Parties:	The Proponent, Environment and Climate Change Canada
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To report bird mortalities to appropriate parties.
Term or Condition:	Any incidents of bird mortalities associated with project activities are to be recorded and reported to Environment and Climate Change Canada (Canadian Wildlife Service). The Proponent shall work with the Canadian Wildlife Service to determine appropriate recording and reporting format and timing.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**60.**
Category:	Birds and Bird Habitat – Wildlife Mitigation Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To mitigate potential impacts to wildlife from aircraft operations.
Term or Condition:	Subject to safety requirements, the Proponent shall ensure that project aircraft maintain sufficient cruising altitudes to avoid disturbance to migratory birds. In particular, the Proponent shall maintain appropriate altitudes in proximity to observed concentrations of migratory birds, caribou and muskoxen that may be encountered during aircraft flights to the George property and other exploration areas, as well as during the transfer of employees between project facilities.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**61.**
Category:	Birds and Bird Habitat – Aircraft Monitoring Measures
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective:	To ensure that project aircraft are in compliance with operational procedures, commitments, and regulatory requirements.
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 for project aircraft is maintained to monitor adherence and to follow up on complaints.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

8.3.12 Marine Environment

Term and Condition No.	**62.**
Category:	Marine Environment - General
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure potential impacts to the marine environment are identified and appropriately mitigated.
Term or Condition:	The Proponent shall maintain a marine monitoring program at the Marine Laydown Area to enable identification of potential impacts of the Project on the marine environment and to inform adaptive management actions. The monitoring program shall be in line with the proposed monitoring in the Aquatic Effects Monitoring Program, or as required by applicable regulatory authorities. At a minimum, water sampling should include end of pipe and

	control area samples, collected on a regular basis to confirm salinity levels of the discharge and the receiving environment.
Reporting Requirements:	The program plan should be submitted to the Nunavut Impact Review Board (NIRB) at least 90 days prior to the start of construction, with results submitted annually thereafter or as may otherwise be required by the NIRB.

8.3.13 Marine Wildlife

Term and Condition No.	**63.**
Category:	Marine Wildlife – Monitoring
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure protection of seals and seal lairs.
Term or Condition:	The Proponent shall undertake a survey for seals and seal lairs annually prior to construction of the winter airstrip and ice road on Bathurst Inlet, and shall take every precaution to align these components to ensure that seal dens/lairs are not impacted by Project infrastructure or activities.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**64.**
Category:	Marine Wildlife – Monitoring
Responsible Parties:	The Proponent, Fisheries and Oceans Canada, and other interested parties
Project Phase:	Prior to Project-Shipping
Objective:	To ensure protection of marine mammals during Project shipping.
Term or Condition:	The Proponent shall ensure that shipping companies contracted for the Project have in place appropriate ship-based marine mammal monitoring programs and protocols developed through consultation with Fisheries and Oceans Canada, communities, and other interested parties. Consideration should be provided for utilizing, trained observers for full-time marine wildlife monitoring with established data collection and recording protocols.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**65.**
Category:	Marine Environment – Marine Shipping
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure community safety and protection of marine/wildlife habitat.
Term or Condition:	The Proponent shall ensure contracted shipping companies are made aware of and required to avoid sensitive wildlife habitat and species along the shipping route and use appropriate protocols and equipment to reduce the potential for an accidental release of fuel or other deleterious substances

	into the marine environment. These protocols should also be communicated to local communities.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

8.4 SOCIO-ECONOMIC TERMS AND CONDITIONS

8.4.1 Economic Development and Opportunities

Term and Condition No.	**66.**
Category:	Economic Development and Opportunities – Socio-Economic Monitoring and Kitikmeot Socio-Economic Monitoring Committee
Responsible Parties:	The Proponent and Kitikmeot Socio-Economic Monitoring Committee
Project Phase:	Pre-Construction, 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 Kitikmeot Socio-Economic Monitoring Committee.
Term or Condition:	The Proponent is strongly encouraged to participate in the work of the Kitikmeot Socio-Economic Monitoring Committee along with other agencies and the communities of the Kitikmeot region, and to identify areas of mutual interest and priority for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the Kitikmeot region as a whole.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**67.**
Category:	Economic Development and Opportunities – Socio-Economic Monitoring
Responsible Parties:	The Proponent, Kitikmeot Inuit Association, Government of Nunavut, Indigenous and Northern Affairs Canada, and Kitikmeot communities
Project Phase:	Pre-Construction, Operations, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Development and establishment of a project specific a Back River Socio-Economic Monitoring Committee to oversee the project-specific monitoring program.
Term or Condition:	The Proponent should work with other socio-economic stakeholders including the Kitikmeot Inuit Association, the Government of Nunavut, Indigenous and Northern Affairs Canada, and communities of the Kitikmeot region, to establish a Back River Socio-Economic Monitoring Committee for the Project to develop and oversee the Back River Socio-Economic Monitoring Program. The Back River Socio-Economic Monitoring Committee should develop Terms of Reference outlining each member's roles and responsibilities for project-specific socio-economic monitoring throughout the life of the Project.
Reporting Requirements:	The Terms of Reference should be submitted to the Nunavut Impact Review Board within six (6) months of issuance of the Project Certificate. All

	updates to the Terms of Reference should be submitted to the Nunavut Impact Review Board during annual socio-economic reporting.

Term and Condition No.	**68.**
Category:	Economic Development and Opportunities – Socio-Economic Monitoring
Responsible Parties:	The Proponent, Kitikmeot Socio-Economic Monitoring Committee, Kitikmeot Inuit Association, Government of Nunavut, Indigenous and Northern Affairs Canada, and Kitikmeot communities
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure / Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Development of the project-specific socio-economic monitoring program and on-going monitoring of project-related socio-economic effects.
Term or Condition:	The Proponent should develop a Project-specific Back River Socio-Economic Monitoring Program designed to: ▪ Monitor for project-induced effects, including the impacts predicted in the Final Environmental Impact Statement through indicators presented in the Back River Socio-Economic Monitoring Plan; ▪ reflect regional socio-economic concerns identified by the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC); ▪ work in collaboration with all other socio-economic stakeholders such as the Kitikmeot Inuit Association, the Government of Nunavut, and Indigenous and Northern Affairs Canada, and the communities of the Kitikmeot region to develop the program; and ▪ include a process for adaptive management and mitigation to respond if unanticipated impacts are identified.
Reporting Requirements:	Details of the Back River Socio-Economic Monitoring Program should be submitted to the NIRB within one (1) year of issuance of the Project Certificate. The Proponent should produce annual Back River socio-economic monitoring reports throughout the life of the Project that are submitted to the Nunavut Impact Review Board and shared with the wider K-SEMC.

Term and Condition No.	**69.**
Category:	Economic Development and Opportunities – Socio-Economic Monitoring and Kitikmeot Socio-Economic Monitoring Committee
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Identify risks and potential effects of temporary mine closures on the Kitikmeot Region.
Term or Condition:	The Proponent should undertake an analysis of the risk of temporary mine closure, giving particular consideration to how communities in the Kitikmeot region may be affected by temporary closure of the mine, including economic, social, and cultural effects. This analysis is required to be

	updated as necessary to reflect significant changes to the Project or the socio-economic conditions in the region that may increase the risks and potential effects of temporary mine closures.
Reporting Requirements:	This initial results of the Proponent's analysis should be provided to the Nunavut Impact Review Board within six (6) months of the issuance of the Project Certificate. Any updates to the analyses should be provided to the NIRB as completed by the Proponent.

Term and Condition No.	**70.**
Category:	Economic Development and Opportunities – Socio-Economic Monitoring and Kitikmeot Socio-Economic Monitoring Committee (K-SEMC)
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Ensuring that the Proponent's Socio-Economic Management Plan addresses the risks and potential effects of temporary mine closures on the Kitikmeot Region.
Term or Condition:	The Proponent is required to update its Socio-Economic Management Plan to include defined measures to address the risks and mitigate the potential effects of temporary closure.
Reporting Requirements:	The required updates to the Socio-Economic Management Plan should be provided to the Nunavut Impact Review Board within three (3) months of the completion of the analysis or updates to the analysis of the risk of temporary mine closure in the term and condition noted above. The Proponent shall reference the updates to its Socio-Economic Management Plan in the annual Back River socio-economic monitoring reports that are submitted to the Nunavut Impact Review Board and shared with the wider K-SEMC throughout the life of the Project.

8.4.2 Employment

Term and Condition No.	**71.**
Category:	Employment – Staff Schedule
Responsible Parties:	The Proponent
Project Phase:	Construction, Operation, Temporary Closure/Care and Maintenance, Closure
Objective:	To produce accurate labour market information regarding available Project employment and skill requirements for the Project to support economic and employment forecasting.
Term or Condition:	To the extent the sharing of such information is consistent with and not limited by any Inuit Impact Benefit Agreement with the Kitikmeot Inuit Association, and in consultation with the Government of Nunavut during preparation, the Proponent should submit detailed staff schedule information, consisting of at least the following items:

	a. Title of positions required by department and division; b. Quantity of positions available by project phase and year; c. Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position; and d. The National Occupational Classification code for each individual position.
Reporting Requirements:	The Staff Schedule should be submitted to the Nunavut Impact Review Board six (6) months prior to each phase of the Project, if the Proponent identifies significant deviations from the labour force requirements in the FEIS and FEIS Addendum, or as may be required by the Nunavut Impact Review Board.

Term and Condition No.	**72.**
Category:	Employment – Registration of Trades Workers
Responsible Parties:	The Proponent, Government of Nunavut
Project Phase:	Pre-Construction, Construction, Operation, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	To ensure that the Government of Nunavut has accurate information to assist in its role as overseer of the apprenticeship program in Nunavut and in providing access to training initiatives and programs.
Term or Condition:	The Proponent is encouraged to identify and register all trades occupations, journeypersons, and apprentices working with the Project, as well as to provide the Government of Nunavut with information regarding the number of registered apprentices and journeypersons from other jurisdictions employed at the Project.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

8.4.3 Education and Training

Term and Condition No.	**73.**
Category:	Education and Training—Training Opportunities
Responsible Parties:	The Proponent, Government of Nunavut, Training Organizations
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Ensuring that the local, regional, and territorial training opportunities associated with the Project maximize opportunities for the regional workforce to obtain transferable skills and certifications.
Term or Condition:	The Proponent is encouraged to work with training organizations and/or government departments offering mine-related or other training to ensure that Project-specific training programs can yield additional opportunities for residents and employees to gain meaningful and transferable skills and certifications.

Reporting Requirements:	The Proponent should summarize the results of these efforts in the annual Back River socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kitikmeot Socio-Economic Monitoring Committee throughout the life of the Project.

Term and Condition No.	**74.**
Category:	Education and Training—Transferable Skills and Certifications
Responsible Parties:	The Proponent, Government of Nunavut, Training Organizations
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Ensuring that the Project maximizes opportunities for the regional workforce to obtain transferable skills and certifications.
Term or Condition:	The Proponent shall develop and maintain an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during project employment. The listing shall indicate which of these certifications and licences would be transferable to a similar job site within Nunavut.
Reporting Requirements:	The initial listing should be provided to the Nunavut Impact Review Board within six (6) months of the Project Certificate being issued. Updates to the list should be included in the annual Back River socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kitikmeot Socio-Economic Monitoring Committee throughout the life of the Project.

Term and Condition No.	**75.**
Category:	Education and Training – Educational Opportunities
Responsible Parties:	The Proponent, Government of Nunavut, Kitikmeot Socio-Economic Monitoring Committee
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Ensuring that the local, regional and territorial educational opportunities maximize the opportunities for Project employment.
Term or Condition:	The Proponent is encouraged to work with the Back River Socio-Economic Monitoring Committee and with the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) to review and monitor education utilization rate trends for Project employees throughout the Project to identify whether or not the Project's employees are accessing educational opportunities available to them in the Kitikmeot region and/or any Northwest Territories communities.
Reporting Requirements:	The summary of this information should be included in the annual Back River socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider K-SEMC throughout the life of the Project.

Term and Condition No.	**76.**
Category:	Education and Training – Inuktitut/Inuinnaqtun Training
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Monitoring training measures being taken to reduce language barriers to Inuit employment on-site.
Term or Condition:	The Proponent is encouraged to provide the following information regarding any second language courses offered on-site: a. Description of courses offered (to include general outline); b. Timing and frequency of courses offered; c. The number of individuals (and percentage of workforce), including Inuit and non-Inuit, taking part in each course, including completion rates; and d. Any noted outcomes or lessons learned from the courses offered.
Reporting Requirements:	Summary should be included in the annual Back River socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider K-SEMC throughout the life of the Project.

8.4.4 Population Demographics

Term and Condition No.	**77.**
Category:	Population Demographics – Monitoring Demographic Changes
Responsible Parties:	The Proponent and the Kitikmeot Socio-Economic Monitoring Committee
Project Phase:	Pre-Construction, Construction, Operation, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Monitoring demographic changes affecting the Kitikmeot communities and the territory as a whole is important to understand and evaluate the Proponent's predictions with regards to population demographics and whether any trends are identified which may be correlated with the Project.
Term or Condition:	Provided the collection and sharing of such information is consistent with and not limited by any Inuit Impact and Benefit Agreement with the Kitikmeot Inuit Association, the Proponent should provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior (where available, to and from, for Cambridge Bay, Kugluktuk, Taloyoak, Gjoa Haven, and Kugaaruk). The details of this process will be captured in the terms of reference for the project specific Back River Socio-Economic Monitoring Committee.
Reporting Requirements:	Summaries of this information should be included in the annual Back River socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kitikmeot Socio-Economic Monitoring Committee throughout the life of the Project.

8.4.5 Traditional Activity and Knowledge

Term and Condition No.	**78.**
Category:	Traditional Activity and Knowledge – Incorporation of IQ and TK
Responsible Parties:	The Proponent, the Kitikmeot Inuit Association, and Kitikmeot Socio-Economic Monitoring Committee
Project Phase:	Pre-Construction, Construction, Operation, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	To ensure monitoring efforts are informed by and reflect Inuit Qaujimaningit and local community knowledge.
Term or Condition:	The Proponent is strongly encouraged to ensure that the development of all project monitoring plans and associated reporting and updates are undertaken with active engagement of Kitikmeot communities, land users, and harvesters. The Proponent should work with the Kitikmeot Inuit Association and the Kitikmeot Socio-Economic Monitoring Committee to report on the collection and integration of Inuit Qaujimaningit and Traditional Knowledge through its monitoring programs for the Project.
Reporting Requirements:	All results should be reported within the annual Back River Socio-Economic Monitoring Report.

Term and Condition No.	**79.**
Category:	Traditional Activity and Knowledge – Inuit Environmental Advisory Committee
Responsible Parties:	The Proponent and Kitikmeot Inuit Association
Project Phase:	Pre-Construction, Construction, Operation, Temporary Closure / Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	Establishing and reporting on the Inuit Environmental Advisory Committee as a mechanism to incorporate community input (including Inuit Qaujimaningit and Traditional Knowledge) into monitoring plans, programs, and mitigation measures.
Term or Condition:	The Proponent shall establish an Inuit Environmental Advisory Committee. To the extent the sharing of such information is consistent with and not limited by any Inuit Impact Benefit Agreement with the Kitikmeot Inuit Association, once established, the Proponent shall provide the Nunavut Impact Review Board with the following information about the Committee: a. Number of members and home communities; b. Selection process; c. Description of work to be undertaken; and d. Outcome of any work undertaken.
Reporting Requirements:	This information should be reported within the annual Back River Socio-Economic Monitoring Report.

Term and Condition No.	**80.**
Category:	Traditional Activity and Knowledge – Wildlife Harvesting
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operation, Temporary Closure / Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	To assess the potential impacts of winter ice road usage on caribou harvesting.
Term or Condition:	If the results from monitoring reveal extensive public use of the winter ice road, or a trend of increasing use of the winter ice road for harvesting, the Proponent shall conduct a harvest study in nearby communities of wildlife harvested from the areas surrounding the winter ice road.
Reporting Requirements:	To be determined following approval of the Minister.

8.4.6 Non-Traditional Land Use and Resource Use

Term and Condition No.	**81.**
Category:	Non-Traditional Activity and Resource Use
Responsible Parties:	The Proponent
Project Phase:	Construction, Operations, and Post-Closure Monitoring
Objective:	To assess and monitor potential project effects on non-traditional activity and knowledge.
Term or Condition:	The Proponent is encouraged to consult with outfitting and guiding businesses that operate in the regional study area regarding use of the land and marine areas in proximity to project infrastructure or activities and any noted project effects, particularly for effects in relation to the experience of the natural environment.
Reporting Requirements:	To be determined following approval of the Minister.

8.4.7 Heritage Resources

Term and Condition No.	**82.**
Category:	Heritage Resources – Assessment of Archaeological and Heritage Resources
Responsible Parties:	The Proponent, Government of Nunavut – Department of Culture and Heritage
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure / Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	To assess and monitor potential project effects to archaeological and heritage resources.
Term or Condition:	In any year in which changes to the project footprint are expected to occur or an archaeological permit will be requested, the Proponent will provide the Government of Nunavut – Department of Culture and Heritage (GN-CH) with a series of maps and tables indicating the current status of all archaeological sites within the Project Development Area. Tables provided

	should include textual descriptions of map contents, and the Proponent shall consult with the GN-CH to establish the contents of the maps and tables to be submitted within its annual status reports.
Reporting Requirements:	To submit for each year in which changes to the project footprint are expected to occur or an archaeological permit will be requested. Specific reporting requirements will be as agreed to by the Government of Nunavut – Department of Culture and Heritage.

8.4.8 Health and Wellbeing

Term and Condition No.	**83.**
Category:	Health and Wellbeing – Employee Housing
Responsible Parties:	The Proponent, Government of Nunavut, Nunavut Housing Corporation
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure / Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	To assess and monitor the extent to which the Project enhances employee access to a range of housing options.
Term or Condition:	The Proponent is strongly encouraged to communicate and collaborate with the Government of Nunavut and the Nunavut Housing Corporation on potential housing initiatives with a view to enhancing employee access to a range of housing options, including homeownership. Initiatives may include, but are not limited to, the provision of financial literacy, financial planning, and personal budgeting training.
Reporting Requirements:	Provided the sharing of such information is consistent with and not limited by the terms and conditions of any applicable Inuit Impact Benefit Agreement with the Kitikmeot Inuit Association, these efforts should be reported to the Nunavut Impact Review Board within the annual Back River Socio-Economic Monitoring Report.

Term and Condition No.	**84.**
Category:	Health and Wellbeing – Employee Housing
Responsible Parties:	The Proponent, Government of Nunavut, Nunavut Housing Corporation, Kitikmeot Socio-Economic Monitoring Committee
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure / Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	To assess and monitor the potential for project-induced effects on regional access to housing.
Term or Condition:	The Proponent is strongly encouraged to work with the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC), the Nunavut Housing Corporation, and the GN to design and implement a voluntary housing survey to be offered to its Nunavummiut employees.
Reporting Requirements:	The frequency and content of the survey should be determined by the collaborating parties, but content may include changes to address, housing status (i.e., public/social, privately owned/rented, government, etc.) and

	migration intentions of Project employees. Non-confidential results of the survey should be reported to the GN and other members of the K-SEMC and summary information of these results should be reported to the Nunavut Impact Review Board within the annual Back River Socio-Economic Monitoring Report.

Term and Condition No.	**85.**
Category:	Health and Wellbeing – Cross-cultural Awareness
Responsible Parties:	The Proponent, Kitikmeot Inuit Association
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure / Care and Maintenance, Closure, and Post-Closure Monitoring
Objective:	To support the elimination of cultural barriers and promote recognition for Inuit Qaujimajatuqangit to establish a healthy workplace for all Project employees.
Term or Condition:	The Proponent is encouraged to work with the Kitikmeot Inuit Association to establish cross-cultural training initiatives which promote respect and consideration for the importance of Inuit Qaujimajatuqangit to the Inuit identity and to make this training available to Project employees and on-site sub-contractors. The Proponent should actively monitor the implementation of these initiatives, including the following items: a. Descriptions of the goals of each program offered; b. Language of instruction; c. Schedules and location(s) of when each program was offered; d. Uptake by employees and/or family members where relevant, noting Inuit and non-Inuit participation rates; and e. Completion rates for enrolled participants, noting Inuit and non-Inuit participation rates.
Reporting Requirements:	Summaries of all cross-cultural training initiatives should be provided in the annual Back River Socio-Economic Monitoring Report.

8.4.9 Human Health and Safety

Term and Condition No.	**86.**
Category:	Human Health and Safety – Airborne Actinolite Fibres
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure worker health and safety.
Term or Condition:	If potential health risks due to airborne actinolite fibres are identified, the Proponent shall enact measures to mitigate human exposure, notify the Territorial occupational health authority, and update relevant management

	plans.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**87.**
Category:	Human Health and Safety – Site Orientation
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure worker health and safety.
Term or Condition:	The Proponent shall have in place a comprehensive site orientation plan for all employees. Further, the Proponent shall ensure all worker site-orientation, training presentations, and materials are updated regularly and reflect any amendments to management plans.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**88.**
Category:	Human Health and Safety – Winter Ice Road Operations
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure worker health and safety.
Term or Condition:	The Proponent shall include, within its relevant management plans, consideration for worker safety during winter ice road operations, particularly during periods of adverse weather conditions. The Proponent shall ensure that updates are made to its safety procedures throughout the life of the Project consistent with best management practices for similar ice road projects.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

8.5 OTHER TERMS AND CONDITIONS

8.5.1 Accidents and Malfunctions

Term and Condition No.	**89.**
Category:	Accidents and Malfunctions - Spills
Responsible Parties:	The Proponent
Project Phase:	Pre-shipping, Construction, Operations, Temporary Closure/Care and Maintenance
Objective:	To protect marine wildlife, migratory birds, and the marine environment.
Term or Condition:	The Proponent shall include within its Wildlife Mitigation and Monitoring Program Plan measures for preventing fuel spills into the marine environment and mitigating potential effects of an accidental spill on polar

	bears, seals, other marine wildlife, and migratory birds. Measures should include: a. Placement of spill prevention and response equipment as necessary to initiate wildlife protection measures along shipping routes and on-site; b. Ensuring spill response contacts for Sabina and government agencies are current; c. Providing a list of community organizations that would be contacted to inform traditional land users of shipping activity in the area, any spills and actions to ensure public safety and plans for clean-up.
Reporting Requirements:	The mitigation plan should be provided to the Nunavut Impact Review Board prior to the commencement of Project-related shipping, and updates provided with annual reporting.

Term and Condition No.	**90.**
Category:	Accidents and Malfunctions - Spills
Responsible Parties:	The Proponent, Transport Canada
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure accurate and adequate spill response and emergency preparedness.
Term or Condition:	The Proponent shall maintain an Oil Pollution Emergency Plan (OPEP) with a list of authorised personnel, staff training, and the required Northwest Territories-Nunavut spill report document.
Reporting Requirements:	The OPEP should be provided to the Nunavut Impact Review Board prior to the commencement of Project-related shipping, and updates provided with annual reporting.

Term and Condition No.	**91.**
Category:	Accidents and Malfunctions – Marine Shipping
Responsible Parties:	The Proponent, Transport Canada
Project Phase:	Prior to Project-shipping, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure protection of the marine environment.
Term or Condition:	The Proponent shall contract only Transport Canada certified shippers to carry cargo for the Project, and will ensure shippers are aware of the requirements of the Shipping Management Plan, the Risk Management and Emergency Response Plan, and the Oil Pollution Emergency Plan.
Reporting Requirements:	Monitoring plans should be provided to the Nunavut Impact Review Board prior to the commencement of Project-related shipping, with annual reporting to be determined following approval of the Project by the Minister.

Term and Condition No.	**92.**
Category:	Accidents and Malfunctions – Marine Shipping
Responsible Parties:	The Proponent
Project Phase:	Prior to Project Shipping, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure protection of the Marine Environment.
Term or Condition:	The Proponent shall ensure that the necessary spill response equipment and training to employees, contractors, and local community members is available prior to commencing Project shipping.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

Term and Condition No.	**93.**
Category:	Accidents and Malfunctions – Navigation Charts
Responsible Parties:	The Proponent, Fisheries and Oceans Canada – Canadian Hydrographic Services
Project Phase:	Post-Construction
Objective:	To mitigate potential ship groundings.
Term or Condition:	The Proponent shall submit a post-construction depiction of the Marine Laydown Area and surrounding shoreline, including any new bathymetry aspects.
Reporting Requirements:	This information shall be provided to Fisheries and Oceans Canada – Canadian Hydrographic Services following construction and when the information is provided to Fisheries and Oceans Canada the Proponent shall advise the Nunavut Impact Review Board that the required information has been submitted.

Term and Condition No.	**94.**
Category:	Accidents and Malfunctions – Fuel Transportation
Responsible Parties:	The Proponent
Project Phase:	Pre-Construction, Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post-Closure Monitoring
Objective:	To ensure protection of the environment.
Term or Condition:	The Proponent shall ensure fuel trucks meet industry design standards and receive regularly scheduled maintenance of fuel lines, nozzles and dust caps.
Reporting Requirements:	To be determined following approval of the Project by the Minister.

9 APPENDIX A: RECORDS OF PROCEEDINGS

Project Proponent:	Sabina Gold & Silver Corp. Suite 375, Two Bentall Centre 555 Burrard Street P.O. Box 220 Vancouver, BC V7X 1M7
Date Project Description Received:	June 14 and 26, 2012
Dates of 2016 Final Hearing:	Day 1: April 25, 2016, Cambridge Bay, NU Day 2: April 26, 2016, Cambridge Bay, NU Day 3: April 27, 2016, Cambridge Bay, NU Day 4: April 28, 2016, Cambridge Bay, NU Day 5: April 29, 2016, Cambridge Bay, NU Day 6: April 30, 2016, Cambridge Bay, NU
Dates of Supplemental Final Hearing:	Day 1: May 31, 2017, Cambridge Bay, NU Day 2: June 1, 2017, Cambridge Bay, NU Day 3: June 2, 2017, Cambridge Bay, NU Day 4: June 3, 2017, Cambridge Bay, NU
Board Members Present (2016):	Elizabeth Copland, Chairperson Phillip (Omingmakyok) Kadlun, Member Marjorie Kaviq Kaluraq, Member Henry Ohokannoak, Member Allen Maghagak, Member
Panel Members Present (2017):	Phillip (Omingmakyok) Kadlun, Chairperson Marjorie Kaviq Kaluraq, Panel Member Allen Maghagak, Panel Member Guy Alikut, Alternate Panel Member

Board Staff:	
Executive Director	R. Barry
Director, Technical Services	T. Arko
Technical Advisor II	K. Benoit (2016 only)
Secretary/Receptionist	L. Atatahak
Outreach Coordinator	S. Taptuna
Environmental Administrator	N. Lear
GIS Specialist	J. Komak
Director, Finance & Administration	M. Ings
Senior Finance Officer	P. Evalik
Manager, Technical Administration	J. Ohokannoak
Manager, Project Monitoring	K. Gillard

	Manager, Communications	J. Ehaloak
	Policy Advisor	H. Rasmussen
	Technical Advisor II	D. St. Pierre
Assistant to the Board Staff:	B. Panegyuk	
Board Legal Counsel:	T. Meadows, Shores Jardine LLP (2016); Meadows Law (2017)	
Interpreters:	J. Tucktoo J. Panioyak N. Amautinuar (2016 only) J. Lafferty (2016 only) B. Martin C. Football (2017 only)	
Court Reporters:	R. Johanson, Dicta Court Reporting (2016 only) C. Longacre, Dicta Court Reporting K. McLeod, Dicta Court Reporting (2017 only)	
Sound Technician:	R. Dempster, PIDO Productions	
Parties: Proponent: Sabina Gold & Silver Corp.	D. B. McLeod, President and Chief Executive Officer (2016 only) M. Pickard, Vice President, Environment and Sustainability W. Carson, Vice President, Project Development N. Hoeller, Vice President, Corporate Secretary and Communications (2017 only) M. Keefe, Environmental Engineer J. Kaiyogana, Community Liaison Officer J. Prno, Community Engagement Advisor A. O'Toole, Government Relations Advisor M. Rykaart, Consultant (SRK) K. Sexsmith, Consultant (SRK) (2016 only) G. Sharam, Consultant (ERM Rescan) C. De La Mare, Consultant (Golder Associates) (2017 only) C. Prather, Consultant (Golder Associates) (2017 only) K. Marchinko, Consultant (ERM Rescan) (2016 only) B. Beall, Consultant (ERM Rescan) (2016 only) B. Armstrong, Legal Counsel (Lawson Lundell) (2017 only) C. Kowbel, Legal Counsel (Lawson Lundell) J. Nyland, Legal Counsel (Lawson Lundell)	
Kitikmeot Inuit Association:	S. Anablak, President P. Emingak, Executive Director G. Clark, Director, Department of Lands and Environment J. Ottenhof, Lands and Environment Officer N. Lower, Fish and Fish Habitat Expert (2016 only)	

	H. Bears, Wildlife Expert Advisor L. Arenson, Geotechnical Engineering Expert (2016 only) R. Nesbitt, Water Quality Expert (2016 only) J. Donihee, Legal Counsel
Government of Nunavut:	B. MacIsaac, Assistant Deputy Minister, Department of Economic Development and Transportation (2017 only) L. Kamermans, Acting Manager, Environmental Assessment and Regulation, Department of Economic Development and Transportation D. Baikie, Acting Manager, Land Use Planning and Environmental Assessment, Department of Environment (2016 only) L. Perrin, Project Manager Impact Assessment, Department of Environment E. Zell, Environmental Assessment Coordinator, Department of Economic Development and Transportation S. Atkinson, Wildlife Consultant, Department of Environment D. Dylan, Legal Counsel (2016 only) E. Stockley, Legal Counsel (2017 only)
Department of Justice (Canada):	K. Landa, Legal Counsel
Environment and Climate Change Canada:	L. Ransom, Senior Environmental Assessment Coordinator A. Wilson, Team Lead, Water Quality J-F. Dufour, Environmental Assessment Officer, Canadian Wildlife Service (2016 only) G. Bernard-Lacaille, Environmental Assessment Coordinator (2017 only)
Department of Fisheries and Oceans:	G. Williston, Senior Fisheries Protection Biologist, Fisheries Protection Program (2016 only) M. D'Aguiar, Senior Fisheries Protection Biologist, Fisheries Protection Program V. D'amours-Gauthier, Senior Fisheries Protection Biologist, Fisheries Protection Program (2017 only)
Indigenous and Northern Affairs Canada:	K. Costello, Director of Resource Management M. Sewchand, Senior Environmental Assessment Specialist (2016 only) J. Patchell, Environmental Assessment Specialist (2016 only) T. Fast, Socio-Economic Analyst (2016 only) D. Zhong, Senior Environment Specialist (2017 only) I. Parsons, Water Resources Regional Co-ordinator (2017 only) R. Theoret-Gosselin, Senior Environmental Assessment Specialist and Project Lead (2017 only) K. Pawley, Manager, Environmental Assessment (2017 only) M. Lupp, Consultant (SNC-Lavalin) (2017 only)

Natural Resources Canada:	R. Besner, Senior Environmental Assessment Officer C. Bailey-Jourdain, Policy Analyst (2017 only)
Transport Canada:	D. Kirkland, Regional Director of Programs (2016 only) A. Downing, Environmental Officer
Registered Intervenors:	
Burnside Hunters and Trappers Organization:	C. (Connie) Kapolak, Chairperson and Community Representative A. Kapolak, Vice-Chairperson and Community Representative S. (Sam) Kapolak, Board Member and Community Representative S. (Susie) Kapolak, Board Member and Community Representative C.(Cassel) Kapolak, Youth Representative and Community Representative
Government of the Northwest Territories:	M. Wendt, Environmental Impact Assessment (In person 2016, by teleconference in 2017) A. Patenaude, Wildlife Biologist (In person 2016, by teleconference for part of 2017 supplemental Final Hearing) J. Z. Adamczewski, Ungulate Biologist (In person 2016, by teleconference in 2017) A. Shafi, Department of Lands (By Teleconference 2017 only)
Łutsel K'e Dene First Nation (2016):	B. Sanderson, Community Intervenor
North Slave Métis Alliance:	S. Shiga, Regulatory Analyst
Umingmaktok Hunters and Trappers Organization (Intervenor in 2016, Community Representatives in 2017):	P. Kapolak, Chairperson J. Tikhak, Sr., Elder M. Kaniak, Elder
Yellowknives Dene First Nation:	A. Power, Regulatory and Research Specialist, Department of Lands and Environment (2016 only) A. Crapaud-Baillargeon, Community Intervenor (2016 only)
Registered Speaker:	
Kitikmeot Regional Wildlife Board (2016):	S. Qingnaqtuq L. Adjun S. Tulurialik E. Ayalik

Community Representatives:
Nunavut:

Cambridge Bay:	T. Maksagak (2016 only) A. Neglak (2016 only) H. Maksagak (2016 only) J. Haniliak Sr. C. Mulhern M. Avalak (2017 only) B. Maksagak (2017 only) C. Nakahok (2017 only)
Kugluktuk:	C. Westwood (2016 only) L. Taipana (2016 only) M. Tiktalik (2016 only) C. Kuneluk (2016 only) L. Adjun P. Taktogon (2017 only) J. Palongayak (2017 only) E. Elias (2017 only)
Omingmaktok (Bay Chimo):	W. Kakolak (2016 only) E. Kakolak (2016 only) N. Haniliak (2016 only) P. Kapolak, (HTO Intervenor in 2016, Community Representative in 2017) J. Tikhak, Sr. (HTO Intervenor in 2016, Community Representative in 2017) M. Kaniak, (HTO Intervenor in 2016, Community Representative in 2017) B. Klengenberg (2017 only) C. Klengenberg (2017 only)
Kingaok (Bathurst Inlet):	J. Akolok (2016 only) S. (Sam) Kapolak S. (Susie) Kapolak C. (Connie) Kapolak C. (Cassel) Kapolak
Gjoa Haven:	J. Tikkiruq (2016 only) P. Arendse (2016 only) B. Putuguq (2016 only) S. Hiqiniq Sr. (2016 only) M. Aglukkaq (2017 only) J. Qiqurt (2017 only) P. Akkikungnaq (2017 only) S. Qitsualik (2017 only) G. Kelly Porter (2017 only)

Taloyoak:	J. Ashevak (2016 only) R. Kayuqtuq (2016 only) P. Quyutinuak Jr. (2016 only) S. Tulurialik (2016 only) D. Totalik (2017 only) B. Takolik (2017 only) S. Oleekatalik (2017 only) J. Ugyuk (2017 only) S. Oleekatalik (2017 only)
Kugaaruk:	N. Nirlungayuk (2016 only) B. Immingark (2016 only) M. Nartok (2016 only) M. Anguti (2016 only) G. Tigvareark M. Karlik Jr. (2017 only) O. Alakannuark (2017 only) M. Kayasark (2017 only) R. Kakkianiun (2017 only)
Northwest Territories:	
Behchokǫ̀:	P. Rabesca (2016 only) M. L. Rabesca T. Steinwand (2017 only)
Dettah:	A. Crappaud-Baillargeon (2016 only) B. Martin (2017 only)
Łutsel K'e:	A. Enzoe (2016 only) B. Enzoe (2017 only)
Wekweètì:	J. Judas C. Football

For access to complete records of sign-in and attendance at the both the 2016 Final Hearing and the supplemental Final Hearing in 2017 please visit the NIRB's on-line public registry at www.nirb.ca by using any of the following search criteria:

- Project Name: Back River Project
- NIRB File No.: 12MN036
- Application No.: 124149

10 APPENDIX A: LIST OF EXHIBITS FROM THE BACK RIVER GOLD MINE PROJECT 2016 FINAL HEARING AND SUPPLEMENTAL FINAL HEARING

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
1.	April 25, 2016	Hard Copy PowerPoint Presentation: Back River (Hannigayok) Gold Project Community Roundtable (sic) [& Final Hearing] Inuktitut	Sabina Gold & Silver Corp. (Sabina)
2.	April 25, 2016	Hard Copy PowerPoint Presentation: Back River (Hannigayok) Gold Project Community Roundtable (sic) [& Final Hearing] Inuinnaqtun	Sabina
3.	April 25, 2016	Hard Copy PowerPoint Presentation: Back River (Hannigayok) Gold Project Community Roundtable (sic) [& Final Hearing] French	Sabina
4.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable (sic) [& Final Hearing] English	Sabina
5.	April 25, 2016	Hard Copy Enlarged Map (slide 13) Entitled: "Potential Development Area and Layout Goose Property Area" English	Sabina
6.	April 25, 2016	Hard Copy Enlarged Map (slide 19) Entitled: "Marine Laydown Area Layout Potential Development Area" English	Sabina
7.	April 25, 2016	Hard Copy Enlarged Map (slide 21)	Sabina

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Entitled: "Winter Ice Road Corridor Overview" English	
8.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Public Participation and Community Engagement Inuktitut	Sabina Gold & Silver Corp. (Sabina)
9.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Public Participation and Community Engagement French	Sabina
10.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Public Participation and Community Engagement English	Sabina
11.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Atmospheric Environment Inuktitut	Sabina
12.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Atmospheric Environment Inuinnaqtun	Sabina
13.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Atmospheric Environment French	Sabina

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
14.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Atmospheric Environment English	Sabina
15.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Freshwater Environment Inuktitut	Sabina Gold & Silver Corp. (Sabina)
16.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Freshwater Environment French	Sabina
17.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Freshwater Environment English	Sabina
18.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Marine Environment Inuktitut	Sabina
19.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Marine Environment Inuinnaqtun	Sabina
20.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Marine Environment French	Sabina

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
21.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Marine Environment English	Sabina
22.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Terrestrial Environment Inuktitut	Sabina
23.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Terrestrial Environment French	Sabina Gold & Silver Corp. (Sabina)
24.	April 25, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Terrestrial Environment English	Sabina
25.	April 25, 2016	Electronic Exhibit Only Video clip, simulation of movement of Bathurst caribou herd based on radio collar data	Sabina
26.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Socio-Economics Inuktitut	Sabina
27.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Socio-Economics Inuinnaqtun	Sabina
28.	April 26, 2016	Hard Copy PowerPoint Presentation	Sabina

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Back River (Hannigayok) Gold Project NIRB Final Hearing: Socio-Economics French	
29.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Socio-Economics English	Sabina
30.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Human Health Inuktitut	Sabina
31.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Human Health Inuinnaqtun	Sabina Gold & Silver Corp. (Sabina)
32.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Human Health French	Sabina
33.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Human Health English	Sabina
34.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Accidents and Malfunctions Inuktitut	Sabina
35.	April 26, 2016	Hard Copy PowerPoint Presentation	Sabina

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Back River (Hannigayok) Gold Project NIRB Final Hearing: Accidents and Malfunctions French	
36.	April 26, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project NIRB Final Hearing: Accidents and Malfunctions English	Sabina
37.	April 26, 2016	Hard Copy PowerPoint Presentation NIRB Final Hearing Sabina Back River Gold Mine Project Government of Nunavut English/Inuktitut	Government of Nunavut
38.	April 26, 2016	Hard Copy PowerPoint Presentation NIRB Final Hearing Sabina Back River Gold Mine Project Government of Nunavut French/Inuinnaqtun	Government of Nunavut
39.	April 26, 2016	Hard Copy Joint Submission on Suggested Terms and Conditions April 26, 2016 English	Sabina Gold & Silver Corp. (Sabina) and Government of Nunavut
40.	April 26, 2016	Hard Copy Joint Submission on Commitments April 26, 2016 English	Sabina Gold & Silver Corp. (Sabina) and Government of Nunavut
41.	April 26, 2016	Hard Copy PowerPoint Presentation Environment and Climate Change Canada's	Environment and Climate Change

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Mine Project English/Inuktitut	Canada (ECCC)
42.	April 26, 2016	Hard Copy PowerPoint Presentation Environment and Climate Change Canada's Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Mine Project English/Inuinnaqtun	ECCC
43.	April 26, 2016	Hard Copy PowerPoint Presentation Environment and Climate Change Canada's Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Mine Project English/French	ECCC
44.	April 26, 2016	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada Inuktitut	Fisheries and Oceans Canada (DFO)
45.	April 26, 2016	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada Inuinnaqtun	DFO
46.	April 26, 2016	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada	DFO

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		French	
47.	April 26, 2016	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada English	DFO
48.	April 27, 2016	Hard Copy Written Record of Sabina Deferred Response to Board staff Question from April 26, 2016 as presented orally on April 27, 2016 English	Sabina Gold & Silver Corp. (Sabina)
49.	April 27, 2016	Hard Copy PowerPoint Presentation Transport Canada Nunavut Impact Review Board Presentation of Technical Submission Sabina Gold & Silver Corp., Back River Mine Project April 2016 Inuktitut	Transport Canada
50.	April 27, 2016	Hard Copy PowerPoint Presentation Transport Canada Nunavut Impact Review Board Presentation of Technical Submission Sabina Gold & Silver Corp., Back River Mine Project April 2016 English	Indigenous and Northern Affairs Canada (INAC)
51.	April 27, 2016	Hard Copy PowerPoint Presentation Indigenous and Northern Affairs Canada Final Hearing for Sabina Gold & Silver Corp.'s Proposed Back River Project English/Inuktitut	INAC
52.	April 27, 2016	Hard Copy	INAC

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		PowerPoint Presentation Indigenous and Northern Affairs Canada Final Hearing for Sabina Gold & Silver Corp.'s Proposed Back River Project English/Inuinnaqtun	
53.	April 27, 2016	Hard Copy PowerPoint Presentation Indigenous and Northern Affairs Canada Final Hearing for Sabina Gold & Silver Corp.'s Proposed Back River Project English/French	INAC
54.	April 27, 2016	Hard Copy and Electronic Copy Figure 4: Calving and Post-Calving Core Ranges for Prescribed Recommendations and Mitigation February 13, 2014 English	Government of Nunavut (GN)
55.	April 27, 2016	Hard Copy and Electronic Copy Figure X: Calving Core Ranges and Key Spring Migration Corridors April 30, 2014 English	Government of Nunavut (GN)
56.	April 27, 2016	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold & Silver Corp.'s Back River Gold Mine Project Inuktitut	Natural Resources Canada (NRCan)
57.	April 27, 2016	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold & Silver Corp.'s Back River Gold Mine Project Inuinnaqtun	NRCan
58.	April 27, 2016	Hard Copy PowerPoint Presentation	NRCan

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Natural Resources Canada's Final Hearing Presentation: Sabina Gold & Silver Corp.'s Back River Gold Mine Project English	
59.	April 27, 2016	Hard Copy PowerPoint Presentation Kitikmeot Inuit Association Presentation on Sabina Gold & Silver Corp.'s Back River Project English	Kitikmeot Inuit Association (KIA)
60.	April 27, 2016	Hard Copy Canadian Water Quality Guidelines for the Protection of Aquatic Life Salinity (Marine) English	Environment and Climate Change Canada
61.	April 27, 2016	Hard Copy, PowerPoint Presentation GNWT/ENR Review of Sabina's Back River Project FEIS NIRB Technical Session Inuktitut	Government of Northwest Territories (GNWT)
62.	April 27, 2016	Hard Copy, PowerPoint Presentation GNWT/ENR Review of Sabina's Back River Project FEIS NIRB Technical Session Inuinnaqtun	GNWT
63.	April 27, 2016	Hard Copy, PowerPoint Presentation GNWT/ENR Review of Sabina's Back River Project FEIS NIRB Technical Session French	GNWT
64.	April 27, 2016	Hard Copy, PowerPoint Presentation GNWT/ENR Review of Sabina's Back River Project FEIS NIRB Technical Session English	GNWT
65.	April 27, 2016	Hard Copy PowerPoint Presentation North Slave Métis Alliance	North Slave Métis Alliance

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Nunavut Impact Board Sabina Gold & Silver Corp. Back River Project Public Hearing April 25-29, 2016 English	
66.	April 28, 2016	Hard Copy PowerPoint Presentation Yellowknives Dene First Nation: Public Hearing of Sabina Back River Project A Life in Peril English	Yellowknives Dene First Nation
67.	Marked: April 28, 2016 Entered: April 29, 2016	Hard Copy Statement of Kitikmeot Regional Wildlife Board Statement on the Proposed Back River (Hannigayok) Gold Project English	Kitikmeot Regional Wildlife Board
68.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Introduction & Overview English	Sabina Gold & Silver Corp. (Sabina)
69.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Goose Property Inuktitut	Sabina
70.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Goose Property Inuinnaqtun	Sabina Gold & Silver Corp. (Sabina)
71.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Goose Property French	Sabina

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
72.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Goose Property English	Sabina
73.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping Inuktitut	Sabina
74.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping Inuinnaqtun	Sabina
75.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping French	Sabina
76.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping English	Sabina
77.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Winter Ice Road Inuktitut	Sabina Gold & Silver Corp. (Sabina)
78.	April 28, 2016	Hard Copy	Sabina

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Winter Ice Road French	
79.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Winter Ice Road English	Sabina
80.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Effects Inuktitut	Sabina
81.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Effects Inuinnaqtun	Sabina
82.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Effects French	Sabina
83.	April 28, 2016	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Effects English	Sabina
84.	April 29, 2016	Electronic and Hard Copy Federal Departments	Sabina Gold & Silver Corp.

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Recommended Proponent Commitments for the Back River Project Dated: April 28, 2016 English	(Sabina)
85.	April 29, 2016	Electronic and Hard Copy Federal Departments Recommended Project Certificate Terms and Conditions for the Back River Project Dated: April 28, 2016 English	Sabina
86.	April 29, 2016	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold & Silver Corp.'s Back River Gold Mine Project Inuktitut	Natural Resources Canada (NRCan)
87.	April 29, 2016	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold & Silver Corp.'s Back River Gold Mine Project Inuinnaqtun	NRCan
88.	April 29, 2016	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold & Silver Corp.'s Back River Gold Mine Project English	NRCan
89.	April 29, 2016	Electronic Copy Only PowerPoint Presentation Kingauk… Our home… English	Burnside Hunters and Trappers Organization
90.	April 29, 2016	Hard Copy Map Entitled: Bluenose-East Caribou: Defining Herd	Government of the

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Location with More or Less Collars (March 2013) English	Northwest Territories
91.	April 30, 2016	Electronic Copy Only North Slave Métis Alliance Nunavut Impact Review Board Sabina Gold & Silver Corp. Back River Project Public Hearing English	North Slave Métis Alliance
92.	April 30, 2016	Hard Copy KIA Wildlife Terms & Commitments and Conditions English	Sabina Gold & Silver Corp. (Sabina) and Kitikmeot Inuit Association (KIA)
93.	April 30, 2016	Hard Copy Terms and Conditions and Commitments April 28, 2016 KIA English	Sabina and KIA
94.	April 30, 2016	Hard Copy *Updated* Joint Submission on Suggested Terms and Conditions (originally filed as Exhibit 39 on April 26, 2016) April 30, 2016 English	Sabina Gold & Silver Corp. (Sabina) Government of Nunavut
95.	April 30, 2016	Hard Copy *Updated* Joint Submission on Commitments (originally filed as Exhibit 40 on April 26, 2016) April 30, 2016 English	Sabina Gold & Silver Corp. (Sabina) Government

2016 FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
			of Nunavut
96.	April 30, 2016	Hard Copy Joint Submission on Suggested Commitments Sabina Gold & Silver Corp. And Government of Nunavut (GN) English	Sabina Gold & Silver Corp. (Sabina) Government of Nunavut
97.	April 30, 2016	Hard Copy Supplemental Submission on Suggested Terms and Conditions/Commitments English	Government of Nunavut

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
1.	May 31, 2017	Hard Copy Opening Remarks by Bruce McLeod to Nunavut Impact Review Board Oral Hearing English	Sabina Gold & Silver Corp. (Sabina)
2.	May 31, 2017	Hard Copy Sabina Experts' Curriculum Vitae Package a. Dr. Gregory Sharam b. Dr. Maritz Rykaart c. Dr. Jason Prno d. Dr. Cameron Stevens e. Dr. Colleen Prather f. Corey de la Mare g. Mike Setterington h. Dr. John Virgl	Sabina
3.	May 31, 2017	Hard Copy Maps Book (Expanded Project Location and Caribou Herd Range Maps already filed with the Board in written submissions)	Sabina
4.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable & Final Hearing: Introduction & Overview English	Sabina
5.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable & Final Hearing: Introduction & Overview Inuktitut	Sabina
6.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable & Final Hearing: Introduction & Overview Inuinnaqtun	Sabina
7.	May 31, 2017	Hard Copy PowerPoint Presentation	Sabina Gold &

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Back River (Hannigayok) Gold Project Community Roundtable & Final Hearing: Introduction & Overview French	Silver Corp. (Sabina)
8.	May 31, 2017	Hard Copy Sabina Gold & Silver Corp.'s Response to the Burnside Hunters and Trapper Organization's Final Written Submission to the NIRB (May 2017)	Sabina
9.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Public Participation and Engagement English	Sabina
10.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Public Participation and Engagement Inuktitut	Sabina
11.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Public Participation and Engagement Inuinnaqtun	Sabina
12.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Public Participation and Engagement French	Sabina
13.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Atmospheric Environment English	Sabina
14.	May 31, 2017	Hard Copy PowerPoint Presentation	Sabina

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Atmospheric Environment Inuktitut	
15.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Atmospheric Environment Inuinnaqtun	Sabina
16.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Atmospheric Environment French	Sabina
17.	May 31, 2017	Hard Copy Wildlife Mitigation and Monitoring Program Plan (WMMPP) May 2017 v. 8	Sabina
18.	May 31, 2017	Hard Copy Update of commitments in the Wildlife Mitigation and Monitoring Program Plan (WMMPP) May 2017 v. 8	Sabina
19.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Terrestrial Environment English	Sabina
20.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Terrestrial Environment Inuktitut	Sabina
21.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Terrestrial Environment Inuinnaqtun	Sabina
22.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Terrestrial Environment	Sabina Gold & Silver Corp. (Sabina)

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		French	
23.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Freshwater Environment English	Sabina
24.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Freshwater Environment Inuktitut	Sabina
25.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Freshwater Environment Inuinnaqtun	Sabina
26.	May 31, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Freshwater Environment French	Sabina
27.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Marine Environment English	Sabina
28.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Marine Environment Inuktitut	Sabina
29.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Marine Environment Inuinnaqtun	Sabina
30.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project	Sabina

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Second NIRB Final Hearing: Marine Environment French	
31.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Socio-Economics English	Sabina
32.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Socio-Economics Inuktitut	Sabina
33.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Socio-Economics Inuinnaqtun	Sabina
34.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Socio-Economics French	Sabina
35.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Human Health English	Sabina
36.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Human Health Inuktitut	Sabina
37.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Human Health Inuinnaqtun	Sabina
38.	June 1, 2017	Hard Copy PowerPoint Presentation	Sabina

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Human Health French	
39.	June 1, 2017	Hard Copy Mackenzie Delta Spill Response Corporation (MDSRC) Letter to Sabina May 29, 2017	Sabina
40.	June 1, 2017	Hard Copy MDSRC Spill Response Equipment Inventory	Sabina
41.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Accidents and Malfunctions English	Sabina
42.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Accidents and Malfunctions Inuktitut	Sabina
43.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Accidents and Malfunctions Inuinnaqtun [NOTE: Although this Exhibit number was preserved for this translated document, the Board ultimately did not receive the translated copy by the close of the Public Hearing Record and therefore there is no Exhibit #43 filed in this Public Hearing as a result]	Sabina
44.	June 1, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Second NIRB Final Hearing: Accidents and Malfunctions French	Sabina
45.	June 1, 2017	Hard Copy Party-Recommended Project Certificate Terms and	Sabina

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Conditions/Commitments (as of May 29, 2017)	
46.	June 1, 2017	Hard Copy PowerPoint Presentation Kitikmeot Inuit Association Presentation on Sabina Gold & Silver Corp.'s Back River FEIS Addendum English	Kitikmeot Inuit Association (KIA)
47.	June 1, 2017	Hard Copy PowerPoint Presentation Kitikmeot Inuit Association Presentation on Sabina Gold & Silver Corp.'s Back River FEIS Addendum Inuktitut [NOTE: Although this Exhibit number was preserved for this translated document, the Board ultimately did not receive the translated copy by the close of the Public Hearing Record and therefore there is no Exhibit #47 filed in this Public Hearing as a result]	KIA
48.	June 1, 2017	Hard Copy PowerPoint Presentation Kitikmeot Inuit Association Presentation on Sabina Gold & Silver Corp.'s Back River FEIS Addendum Inuinnaqtun [NOTE: Although this Exhibit number was preserved for this translated document, the Board ultimately did not receive the translated copy by the close of the Public Hearing Record and therefore there is no Exhibit #48 filed in this Public Hearing as a result]	KIA
49.	June 1, 2017	Hard Copy PowerPoint Presentation NIRB Final Hearing Sabina "Back River" Project Government of Nunavut English/Inuktitut	Government of Nunavut (GN)
50.	June 1, 2017	Hard Copy PowerPoint Presentation NIRB Final Hearing Sabina "Back River" Project	GN

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Government of Nunavut French/Inuinnaqtun	
51.	June 1, 2017	Hard Copy PowerPoint Presentation Environment and Climate Change Canada's Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Mine Project English/Inuktitut	Environment and Climate Change Canada (ECCC)
52.	June 1, 2017	Hard Copy PowerPoint Presentation Environment and Climate Change Canada's Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Mine Project English/Inuinnaqtun	ECCC
53.	June 1, 2017	Hard Copy PowerPoint Presentation Environment and Climate Change Canada's Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Mine Project English/French	ECCC
54.	June 1, 2017	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada English	Fisheries and Oceans Canada (DFO)
55.	June 1, 2017	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada Inuktitut	DFO
56.	June 1, 2017	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada	DFO

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Inuinnaqtun	
57.	June 1, 2017	Hard Copy PowerPoint Presentation Back River Mine Project Presentation to the Nunavut Impact Review Board Fisheries and Oceans Canada French	Fisheries and Oceans Canada
58.	June 1, 2017	Hard Copy Executive Summary Indigenous and Northern Affairs Canada English	Indigenous and Northern Affairs Canada (INAC)
59.	June 1, 2017	Hard Copy Executive Summary Indigenous and Northern Affairs Canada Inuktitut	INAC
60.	June 1, 2017	Hard Copy Executive Summary Indigenous and Northern Affairs Canada Inuinnaqtun	INAC
61.	June 1, 2017	Hard Copy Executive Summary Indigenous and Northern Affairs Canada French	INAC
62.	June 1, 2017	Hard Copy PowerPoint Presentation Sabina Gold and Silver Corporation's Proposed Back River Gold Mine Project NIRB Technical Session Indigenous and Northern Affairs Canada English/Inuktitut	INAC
63.	June 1, 2017	Hard Copy PowerPoint Presentation Sabina Gold and Silver Corporation's Proposed Back River Gold Mine Project NIRB Technical Session Indigenous and Northern Affairs Canada English/Inuinnaqtun	INAC

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
64.	June 1, 2017	Hard Copy PowerPoint Presentation Sabina Gold and Silver Corporation's Proposed Back River Gold Mine Project NIRB Technical Session Indigenous and Northern Affairs Canada English/French	Indigenous and Northern Affairs Canada
65.	June 2, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold and Silver Corp.'s Back River Gold Mine Project English	Natural Resources Canada (NRCan)
66.	June 2, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold and Silver Corp.'s Back River Gold Mine Project Inuktitut	NRCan
67.	June 2, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold and Silver Corp.'s Back River Gold Mine Project Inuinnaqtun	NRCan
68.	June 2, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Final Hearing Presentation: Sabina Gold and Silver Corp.'s Back River Gold Mine Project French	NRCan
69.	June 2, 2017	Hard Copy PowerPoint Presentation Transport Canada Presentation of Technical Submission for Sabina Gold and Silver Corporation Back River Gold Mine Project English	Transport Canada (TC)
70.	June 2, 2017	Hard Copy PowerPoint Presentation Transport Canada	TC

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Presentation of Technical Submission for Sabina Gold and Silver Corporation Back River Gold Mine Project Inuktitut	
71.	June 2, 2017	Hard Copy PowerPoint Presentation Transport Canada Presentation of Technical Submission for Sabina Gold and Silver Corporation Back River Gold Mine Project Inuinnaqtun	Transport Canada (TC)
72.	June 2, 2017	Hard Copy PowerPoint Presentation Transport Canada Presentation of Technical Submission for Sabina Gold and Silver Corporation Back River Gold Mine Project French	Transport Canada
73.	June 2, 2017	Hard Copy Canada's Ocean Protection Plan Office of the Prime Minister	Sabina Gold & Silver Corp.
74.	June 2, 2017	Hard Copy Kinguak – to take away give back	Burnside Hunters and Trappers Organization
75.	June 2, 2017	Hard Copy PowerPoint Presentation Kingaunmi: To take always give back	Burnside Hunters and Trappers Organization
76.	June 2, 2017	Hard Copy PowerPoint Presentation North Slave Métis Alliance Sabina Gold and Silver Corp. Back River Project Public Hearing May 31-June 3, 2017	North Slave Métis Alliance
77.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping English	Sabina Gold & Silver Corp.

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
78.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping Inuktitut	Sabina Gold & Silver Corp. (Sabina)
79.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping Inuinnaqtun	Sabina
80.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Marine Laydown Area and Shipping French	Sabina
81.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Winter Ice Road English	Sabina
82.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Winter Ice Road Inuktitut	Sabina
83.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Winter Ice Road Inuinnaqtun	Sabina
84.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Winter Ice Road French	Sabina
85.	June 2, 2017	Hard Copy PowerPoint Presentation	Sabina Gold &

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Impacts English	Silver Corp. (Sabina)
86.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Impacts Inuktitut	Sabina
87.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Impacts Inuinnaqtun	Sabina
88.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Caribou and Transboundary Impacts French	Sabina
89.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Goose Property English	Sabina
90.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Goose Property Inuktitut	Sabina
91.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project Community Roundtable: Goose Property Inuinnaqtun	Sabina
92.	June 2, 2017	Hard Copy PowerPoint Presentation Back River (Hannigayok) Gold Project	Sabina Gold & Silver Corp.

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Community Roundtable: Goose Property French	
93.	June 3, 2017	Hard Copy PowerPoint Presentation Kitikmeot Inuit Association Presentation on Sabina Gold & Silver Corp.'s Back River Project FEIS Addendum English	Kitikmeot Inuit Association
94.	June 3, 2017	Hard Copy Memorandum of Understanding Cooperation on Managing Shared Populations of Caribou (GNWT and GN) and Appendices English	Government of Nunavut (GN)
95.	June 3, 2017	Hard Copy PowerPoint Presentation NIRB Final Hearing: Sabina "Back River" Project Government of Nunavut English/Inuktitut	GN
96.	June 3, 2017	Hard Copy PowerPoint Presentation NIRB Final Hearing: Sabina "Back River" Project Government of Nunavut Inuinnaqtun/French	GN
97.	June 3, 2017	Hard Copy PowerPoint Environment and Climate Change Canada's Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Project English/Inuktitut	Environment and Climate Change Canada (ECCC)
98.	June 3, 2017	Hard Copy PowerPoint Environment and Climate Change Canada's Presentation to the Nunavut Impact Review Board Concerning the Sabina Gold & Silver Corp. Back River Gold Project English/Inuinnaqtun	ECCC
99.	June 3, 2017	Hard Copy PowerPoint Presentation Sabina Gold & Silver Corporation's Back River Gold	Indigenous and Northern

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Mine Project Nunavut Impact Review Board Community Roundtable Sessions English/Inuktitut	Affairs Canada (INAC)
100.	June 3, 2017	Hard Copy PowerPoint Presentation Sabina Gold & Silver Corporation's Back River Gold Mine Project Nunavut Impact Review Board Community Roundtable Sessions English/Inuinnaqtun	INAC
101.	June 3, 2017	Hard Copy PowerPoint Presentation Sabina Gold & Silver Corporation's Back River Gold Mine Project Nunavut Impact Review Board Community Roundtable Sessions English/French	INAC
102.	June 3, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Community Roundtable Presentation: Sabina Gold and Silver Corp.'s Back River Gold Mine Project English	Natural Resources Canada (NRCan)
103.	June 3, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Community Roundtable Presentation: Sabina Gold and Silver Corp.'s Back River Gold Mine Project Inuktitut	NRCan
104.	June 3, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Community Roundtable Presentation: Sabina Gold and Silver Corp.'s Back River Gold Mine Project Inuinnaqtun	NRCan
105.	June 3, 2017	Hard Copy PowerPoint Presentation Natural Resources Canada's Community Roundtable Presentation: Sabina Gold and Silver Corp.'s Back River	Natural Resources Canada

SUPPLEMENTAL FINAL HEARING			
Exhibit	**Date of Receipt**	**Exhibit Description**	**Party Tendering Exhibit**
		Gold Mine Project French	
106.	June 3, 2017	Hard Copy Supplemental Party-Recommended Project Certificate Terms & Conditions/ Commitments KIA/Burnside HTO	Sabina Gold & Silver Corp. (Sabina)
107.	June 3, 2017	Hard Copy Closing Statement Regarding the Nunavut Impact Review Board Second Public Hearing May-June 2017 on the Back River Gold Mine Project June 3, 2017	Sabina

11 APPENDIX B: LIST OF ACRONYMS

AANDC	Aboriginal Affairs and Northern Development Canada
AEMP	Aquatic Effects Management/Monitoring Plan
BCHCAC	Bathurst Caribou Herd Co-operative Advisory Committee
BCRP	Bathurst Caribou Range Plan
BIPR	Bathurst Inlet Port and Road
BHTO	Burnside Hunters and Trappers Organization
dB	Decibels (instantaneous)
dBA	Decibels (continuous)
CCME	Canadian Council of Ministers of the Environment
Cm	Centimetres
CEA	Cumulative Effects Assessment
CO	Carbon Monoxide
COPC	Contaminant of Potential Concern
CRA	Commercial, Recreational, or Aboriginal (fisheries species)
DFO	Fisheries and Oceans Canada
DEIS	Draft Environmental Impact Statement
ECCC	Environment and Climate Change Canada
EC	Environment Canada
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GN	Government of Nunavut
GN-DCH	Government of Nunavut – Department of Culture and Heritage
GNWT	Government of the Northwest Territories
GOC	Government of Canada
Ha	Hectares
HC	Health Canada
HQ	Hazard Quotient
HHRA	Human Health Risk Assessment
HTO	Hunters and Trappers Organization
IEAC	Inuit Environmental Advisory Committee
IIBA	Inuit Impact and Benefit Agreement
INAC	Indigenous and Northern Affairs Canada
IR	Information Request
Km	Kilometre
KIA	Kitikmeot Inuit Association
K-SEMC	Kitikmeot Socio-Economic Monitoring Committee
LSA	Local Study Area
LKDFN	Łutsel K’e Dene First Nation
MDSRC	Mackenzie Delta Spill Response Corporation

MLA	Marine Laydown Area
MMER	Metal Mining Effluent Regulation
M	Metres
NO_2	Nitrogen Oxide
NIRB	Nunavut Impact Review Board
NAC	Nunavut Arctic College
NLCA	Nunavut Land Claims Agreement
NPAG	Non-Potentially Acid-Generating
NPA	Navigation Protection Act
NPC	Nunavut Planning Commission
NRCan	Natural Resources Canada
NSMA	North Slave Métis Alliance
NWB	Nunavut Water Board
NWT	Northwest Territories
OHTO	Omingmaktok Hunters and Trappers Organization
OPEP	Oil Pollution Emergency Plan
PAH	Polycyclic Aromatic Hydrocarbons
PC	Parks Canada
PHC	Pre-hearing Conference
PM	Particulate Matter
PDA	Potential Development Area
RAA	Range Assessment Areas
RSA	Regional Study Area
SWP	Saline Water Pond
SSWQO	Site Specific Water Quality Objective
SARA	Species at Risk Act
SEMC	Socio-Economic Monitoring Committee
SEMP	Socio-Economic Monitoring Plan
SLERA	Screening Level Ecological Risk Assessment
SON	Subject of Note
SO_2	Sulphur Dioxide
TC	Transport Canada
TF	Tailings Facility
TSF	Tailings Storage Facility
TSS	Total Suspended Solid
VEC	Valued Ecosystem Component
VMP	Vegetation Monitoring Plan
VOC	Volatile Organic Compounds
VEC	Valued Ecosystemic Component
VSEC	Valued Socio-Economic Component
WRSA	Waste Rock Storage Area
WMMP	Wildlife Mitigation and Monitoring Plan

WMMPP	Wildlife Mitigation and Monitoring Program Plan
YKDFN	Yellowknives Dene First Nation
ZOI	Zone of Influence