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Cambridge Bay
Ikaluktutiak
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Kelli Gillard
Manager Project Monitoring
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU
X0B 0C0

Kugluktuk
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July 16th, 2020

Re: Review of Sabina’s 2020 Back River Project Modification Package.

Bathurst Inlet
Kingaok
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Dear Kelli Gillard, the KIA has reviewed Sabina’s 2020 Back River Project modification package. The KIA’s consultants in geotechnical engineering, aquatic sciences, and wildlife assessed the modification package in terms of:

- a. Whether the proposed modification constitutes a significant modification to the original project as previously assessed and subsequently modified and approved by the NIRB;
- b. Whether the proposed modification is consistent with the terms and conditions of the existing Project Certificate No. 007, or are changes to the Project Certificate necessary to reflect the modification; and
- c. Any matter of importance to the commenting party related to the Board’s processing of the project proposal.

Bay Chimo
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KIA’s geotechnical engineering consultant, BGC Engineering Inc., focused upon the following aspects of the modification package:

Gjoa Haven
Okhoktok
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- Technical review of Terrestrial Environment with regards to:
 - Geology and Permafrost; and
 - Landforms and Soils;
- Technical review of Tailings and Waste Rock Management;
- Project review regarding
 - Geotechnics;
 - Geochemistry (ARD & ML);
 - Technical review of Freshwater Environment with regards to Hydrogeology; and
 - Technical review of Atmospheric Environment with regards to Climate and Meteorology.

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Kugaaruk
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Our aquatic science consultant, Hutchinson Environmental Sciences Ltd. focused upon:

- Fresh and marine water quality and quantity,



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- Freshwater and marine sediment quality, and
- Fish and fish habitat.

And KIA's wildlife consultant, Zoetica Environmental Consulting Services Ltd focused upon:

- Wildlife and habitat.

KIA's consultant opinions to NIRB's requested three points of consideration are as follows:

a) Whether the proposed modification constitutes a significant modification to the original project as previously assessed and subsequently modified and approved by the NIRB.

Sabina has proposed changes to all three major areas of the Back River Project: at the Marine Laydown Area (MLA), along the winter ice road and at the Goose Property. While the changes proposed are substantive, they are not likely to alter the conclusions presented within the Final Environmental Impact Statement (FEIS) pertaining to any of the key areas evaluated through the effects assessment (direction, magnitude, duration, frequency, geographic extent or reversibility) for the Valued Ecosystem Components within our bailiwick.

KIA's aquatic consultant, HESL, therefore supports Sabina's assessment that the proposed project activities and associated management and mitigation activities, as described in their application, do not constitute a significant divergence from the project or its effects as previously evaluated by the NIRB.

HESL notes however that the proposed activities and associated management and mitigations as outlined in the modification package will need to be technically evaluated to substantiate Sabina's conclusion that impacts to the marine and freshwater environments from the proposed activities are "not significant".

The proposed modifications, however, will substantially change the approach to water management on site, requiring a substantive update to the water and load balance models. Sabina has included these updates in the modification package. The proposed activities and supporting documentation, in particular the water management plan, which includes both the updated water and load balance model and the saline water management plan, along with the updated Spills Management Plan, should be reviewed as part of a Water Licence amendment through the Nunavut Water Board process. Revisions to the fish habitat offsetting plan will also need to be evaluated at subsequent stages. We also note that reclamation security at the Goose Property, the MLA and along the winter road will require a re-evaluation. HESL highlight's the following key modifications that are expected to impact Sabina's strategy of water management for the Back River project and will require evaluation through water licencing:



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- Reduction from four pits to three while increasing the size of each thereby altering project interactions with surface water in the receiving environment during operations as well as at closure when discharges from the Goose Property are expected to commence.
- Reduction in the number of tailings storage facilities from three to two with an associated decrease in the expected volume and complexity of tailings requiring management.
- Reduction from four underground workings to one while extending the depth from 650 m to 900 m thereby altering interactions with sub permafrost saline groundwater.
- Reduction of the number of waste rock storage areas while increasing their overall size to accommodate an increase in the expected volume of both potentially acid generating (PAG) and non-potentially acid generating (NPAG) waste rock.
- Increased water usage both at the Goose Property as well as along the Winter Ice Road.
- New interactions between project activities and fish and fish habitat at the Goose Site, MLA and along the Winter Road with a particular focus at the new all-weather sections.

Interactions with these project modifications and others can be sufficiently addressed through an amendment to Sabina's water licence.

The opinion of KIA's engineering consultant BGC Engineering is that as per Sabina's NIRB-Self Assessment (Back River Project Modification Package Table 1.7-1.) all proposed modifications have been evaluated as non-significant and therefore, a NIRB assessment would not be required.

b) Whether the proposed modification is consistent with the terms and conditions of the existing Project Certificate No. 007, or are changes to the Project Certificate necessary to reflect the modification.

HESL has reviewed the existing Project Certificate No. 007 to assess whether the terms and conditions contained therein remain appropriate to address the scope of Sabina's proposed modifications. Terms and conditions pertaining to the relevant project components were written with a sufficiently broad scope to encompass the activities previously evaluated by the NIRB as well as those modifications outlined in Sabina's submission. These include tailings and treatment sludges, hydrogeology, groundwater quantity and quality, the freshwater environment including fish and fish habitat and surface quantity and quality, the marine environment including marine fish habitat, and accidents and malfunctions in both the marine environment and throughout the project footprint. HESL notes that terms and conditions pertaining to climate change will also continue to apply as the proposed project length is only increased by two years during the operation phase.



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HESL therefore concludes that the proposed modification is consistent with the terms and conditions of the existing Project Certificate. No changes are necessary to address Sabina's proposed project modifications.

Under the scope introduced above and with the exception of the WIR upgrade, BGC Engineering does not have concerns with the proposed project modifications detailed in Sabina's Back River 2020 Modification Package (June 2020). This is mainly related to the fact that the proposed modifications are either minor in extent, underground or result in reductions in potential impact. BGC does not consider the proposed modifications as significant with regards to the original project nor has BGC identified inconsistencies with the terms and conditions of the existing Project Certificate No. 007.

c) Any matter of importance to the commenting party related to the Board's processing of the project proposal.

HSEL concurrences with Sabina's effects assessment of the proposed modifications and the conclusion that they do not constitute a "significant modification" are based on their review of the proposed scope of the activities and not on a detailed technical review of the application. HSEL would expect that the technical review would be completed as part of a Water Licence Amendment process should NIRB approve the proposed modifications. While we generally agree that the scope of the modifications proposed for the Back River project will not result in a divergence from the short and long term project effects presented in the FEIS, nor to the existing terms and conditions, this conclusion needs to be substantiated by detailed technical review. The proposed modifications may need to be referred back to the NIRB for a re-evaluation if the technical review of the supporting documentation did not substantiate the conclusions provided by Sabina in their application.

With regards to the placement of additional aggregates along selected sections of the WIR, BGC recommends that additional considerations should be made, in accordance with PC No. 007 Term and Condition No. 34. It is important to note that the KIA had indicated concerns regarding potential use of aggregates to comply with vertical alignment and associated impacts during the review of the FEIS (F-KIA-IR-20). This concern was ultimately addressed through the aforementioned condition. However, considering that this modification is likely required in sensitive terrain, it is recommended that Sabina provides additional information regarding the thermal changes of the terrain in response to the aggregate placement and evaluates potential long-term impacts associated with the aggregate placement and quarry development. In addition, considerations for the closure of the WIR should be provided.

Table 1 summarizes BGC's comments related to the proposed changes under BGC's scope.



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Table 1. Summary of comments on proposed project modifications as per the 2020 Back River Project Modification Package submitted by Sabina (June 2020).

Element	BGC comments to minimize potential environmental impacts, if applicable
Extension of the Umwelt underground workings	BGC has no concerns regarding this proposed project modification.
Expansion of the Goose all-weather airstrip	BGC has no concerns regarding this proposed project modification.
Ongoing use of seasonal ice airstrip at the Goose Property	BGC has no concerns regarding this proposed project modification.
Increase in water usage from Goose Lake and Big Lake	BGC has no concerns regarding this proposed project modification.
Ongoing use of approved facilities and infrastructure at the Goose Property	BGC has no concerns regarding this proposed project modification
Expansion of the MLA all-weather airstrip	BGC has no concerns regarding this proposed project modification
Ongoing use of seasonal ice airstrip at MLA	BGC has no concerns regarding this proposed project modification
Installation of an intermediate fuel pump station at MLA	BGC has no concerns regarding this proposed project modification
Installation of a 500,000 litre fuel tank at MLA	BGC has no concerns regarding this proposed project modification
Extension of existing shoreline pad to facilitate offloading at MLA	BGC has no concerns regarding this proposed project modification
Ongoing use of approved infrastructure and facilities at MLA	BGC has no concerns regarding this proposed project modification
Upgrade select sections of the WIR through placement of aggregate	For the 2020 project upgrade, Sabina indicates that the proposed WIR Subbase Upgrade footprint of approximately 15 ha represents 0.01% of the Project LSA, resulting in a negligible amount of additional footprint (p. 6-6). However, fill placement may be required in sensitive sections and therefore, an evaluation of the thermal disturbance and associated long-term impacts on the permafrost and surface water flow is recommended. In addition, it is recommended that the proponent provide a closure and monitoring program for the fill sections and additional quarries used.
Increase in water usage for WIR construction and maintenance	BGC has no concerns regarding this proposed project modification



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Element	BGC comments to minimize potential environmental impacts, if applicable
Replacement of mobile emergency shelter	BGC has no concerns regarding this proposed project modification
Increase in waste rock volume	BGC has no concerns regarding this proposed project modification
Increase in overburden volume	BGC has no concerns regarding this proposed project modification
Reduction of number of waste rock storage areas (WRSA)	BGC has no concerns regarding this proposed project modification
Reduction in open pits	BGC has no concerns regarding this proposed project modification
Reduction in underground mines	BGC has no concerns regarding this proposed project modification
Reduction of tailings storage facilities	BGC has no concerns regarding this proposed project modification
Additional two years of operations	BGC has no concerns regarding this proposed project modification
Reduction in process plant throughput	BGC has no concerns regarding this proposed project modification
Usage of small diameter flexible pipe as MLA desalination plant intake and discharge.	BGC has no concerns regarding this proposed project modification.

The KIA's wildlife consultant, Zoetica Environmental, provided the following comments and recommendations.

Back River Project Modification Package (MP), June 2020

KIA-MP-01

Review Comment Number	KIA-MP-01
Subject/Topic	Airstrip extensions
References	Back River Project - Modification Package <ul style="list-style-type: none"> • Section 2.1.1, p. 2-1 • Section 4.2.1, p. 4-6
Summary	Sabina is proposing a modification to the Project to allow an extension of the Goose Property all-weather 5,000-ft by 150-ft airstrip to 6,000 ft by 200 to allow an extension of the Marine Laydown Area (MLA) all-weather 3,000-ft by 150-ft



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	airstrip to 5,000 ft by 200 ft.
Detailed Review Comment	An issue discussed at the final EIS hearings was aircraft noise and potential disturbance to wildlife. Project effects were assessed based on aircraft noise projections and flight frequency. The proposed Goose Property and MLA airstrip extensions could result in changes in the type of aircraft capable of landing, which may alter projections for noise and flight frequency. Aircraft overflights can alter the behaviour of animals and solicit physiological responses; a more worrisome impact would be the potential for influence of frequent overflights on the overall migration routes and land use of barren ground caribou in the general area. Enabling of larger planes to come into and out of site could reduce the number of flights needed, potentially benefitting wildlife relative to previous project configuration.
Recommendation/Request	The KIA requests the following: <ul style="list-style-type: none"> • Can Sabina provide more information about their assumed flight frequency, and how this landing strip extension could alter predictions made in the FEIS around aircraft disturbance to wildlife? • Additional monitoring of the number of flights, aircraft type use, and flight periodicity will help to determine how the amendment may be affecting aircraft disturbance to wildlife relative to previous FEIS predictions.
Importance of Issue	Moderate

KIA-MP-02

Review Comment Number	KIA-MP-02
Subject/Topic	Loss and disturbance to fish habitat resulting from proposed MLA Shoreline Pad Extension
References	Back River Project - Modification Package <ul style="list-style-type: none"> • Section 5.1.6, p. 5-6
Summary	Proposed MLA Shoreline Pad Extension will result in loss of subtidal and intertidal habitat (~0.04ha) that will result in potential adverse effects to fish and fish habitat.
Detailed Review Comment	Sabina has indicated that the MLA Shoreline Pad Extension could result in direct fish mortality due to crushing or smothering if fish are unable to escape the construction area. Mitigation methods proposed include timing construction within specific fish windows, use of



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	sedimentation curtains, and working with ground-fast ice conditions. Additional mitigation measures should be included to address potential construction-related noise impacts to fish and marine wildlife.
Recommendation/Request	The KIA requests the following: <ul style="list-style-type: none"> • Sabina should ensure that mitigation methods also include use of bubble curtains during relevant work windows to limit noise and vibration induced mortality to fish due to barometric pressure trauma, and to reduce noise-induced impacts to marine wildlife. Bubble curtain use around any using underwater pile driving, for example, should be included as best practice.
Importance of Issue	Moderate

KIA-MP-03

Review Comment Number	KIA-MP-03
Subject/Topic	Proposed Winter Ice Road (WIR) Subbase Upgrade
References	Back River Project - Modification Package <ul style="list-style-type: none"> • Section 6.1.3, p. 6-2 • Section 6.1.4, p. 6-3
Summary	Sabina is proposing to upgrade approximately 15 km segment of WIR using 150,000 m ³ of excavated material. Excavated material will be extracted from quarries and borrow pits along the WIR. The upgraded section is proposed to be approximately 10 metres wide and 1 metre high.
Detailed Review Comment	Potential effects of the proposed road upgrades relate to surface hydrology, water quality, archaeology, wildlife, vegetation and landforms. Gravel roads, often used in Arctic ecosystems, alter surface and subsurface conditions. These alterations, which could occur over the 15 km stretch of road to be filled, typically influence the surface energy balance, near-surface ground thermal properties, and the temperature regime of the underlying and adjacent permafrost. Road embankments also modify local hydrology and create a physical Barrier that fragments the landscape. The Road Management Plan and Borrow Pits and Quarry Management Plan describe mitigation measures, including setbacks from water, geochemical confirmation of material suitability and assessment of archaeological, vegetation and/or wildlife status.



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	<p>Additional information will be required to determine project effects and mitigation required for specific VCs. The KIA would like to understand more about the likely impacts of changes to: surface hydrology and vegetation on either side of this road, as such impacts can extend quite far; potential impacts to surface hydrology runoff into fish bearing habitats; and eskers in the surrounding area, as these may be a source of road fill material but they are also important habitat for caribou as travel and escape cover (from insects), and as denning habitat for wolves, foxes and grizzly bear. Road upgrades (elevation of grade) may also affect caribou movement across these linear corridors.</p>
<p>Recommendation/Request</p>	<p>The KIA requests the following information:</p> <ul style="list-style-type: none"> • What changes in surface hydrology are expected and how might existing ecosystems (e.g., sedge wetlands, heath tundra, riparian shrub) be affected? • How will quarries and borrow pits be selected and assessed to determine habitat value for wildlife, specifically caribou and denning mammals? Can Sabina please supply maps of intended quarry sites for review? • Would potential changes to surface hydrology affect fish habitat in terms of seasonal water volume and availability? • What percentage of the Special Landforms (Esker, specifically) VC would road upgrades impact as a result of quarry or borrow pits? • What percentage of vegetation would be impacted based on direct (footprint) and indirect (surface hydrology) impacts of the project modification? • What proportion of the WIR will be suitable for all season travel after upgrades are completed? • Does the proponent intend to use any portion of the road year-round? If so, how will potential impacts to wildlife and vegetation be assessed? <p>In supplying answers to these additional answers and pieces of information about the project, there may be a need for additional management plans specific to the construction and operation of the 15 km infilled road segment.</p>
<p>Importance of Issue</p>	<p>Moderate</p>



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KIA-MP-04

Review Comment Number	KIA-MP-04
Subject/Topic	Winter Ice Road Service/Emergency Camps
References	Back River Project - Modification Package <ul style="list-style-type: none"> • Section 6.2.3, p. 6-8 • Section 6.2.7, p. 6-11
Summary	Sabina is proposing that three permanent WIR camps be installed along the approximately 160-km WIR alignment. The three camps would have a capacity of 20-50 people each, and each camp would have a footprint of approximately 1 hectare.
Detailed Review Comment	Construction of additional WIR camps will have potential direct, indirect and cumulative impacts. There are now two major camps, potentially one more, and 3 WIR camps. A total of 5 to 6 camps will result in a substantial human presence across the landscape. Depending on camp locations, human disturbance could have varying impacts on wildlife, vegetation and water quality. Caribou movement patterns may be adversely affected by camp locations within known movement corridors. Location and proximity of camps may also pose an issue as a bear attractant, which may require Sabina to amend management plans with careful consideration of all BearWise audit recommendations.
Recommendation/Request	The KIA requests the following: <ul style="list-style-type: none"> • Please identify locations of proposed WIR camps with respect to existing caribou habitat and bear denning areas; • Please provide the dates of WIR camp construction and use alongside key wildlife windows; • Update management plans to incorporate all BearWise recommendations; • Please describe if and how the camps will be secured or taken down when not in use. Grizzly bears getting into abandoned camps has been an issue in the region in the past; • Describe what equipment for water testing, waste and greywater treatment will be present at each camp?
Importance of Issue	Moderate



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KIA-MP-05

Review Comment Number	KIA-MP-05
Subject/Topic	Environmental Reporting
References	Back River Project - Modification Package – Appendix B. Water Management Plan <ul style="list-style-type: none">• Section 11, p. 11-1
Summary	Internal and external reporting structures have been established as part of the monitoring framework. These structures involve agencies including NIRB, AEMP, DFO and ECCC.
Detailed Review Comment	All regulatory submissions provided to other agencies should also be provided to KIA to ascertain compliance and identify potential issues on Inuit Owned Land. .
Recommendation/Request	The KIA requests/recommends the following: <ul style="list-style-type: none">• Provide KIA with an opportunity to review relevant regulatory submissions in a timely manner• Explore opportunities to employ local Inuit as independent environmental monitors
Importance of Issue	Moderate

Thank you

John Roesch, P.Eng.

Senior Hope Bay Project Officer
Kitikmeot Inuit Association, Department of Lands and Environment

Cc Geoff Clark, Director, KIA, Department of Lands and Environment